PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 64 (ii)

HEATING SYSTEMS AND APPARATUS

[*other than* HEATING LIQUIDS AND GASES *and* SURFACE APPARATUS FOR EFFECTING TRANSFER OF HEAT]

PERIOD—A.D. 1921-25 [155,801—244,800]

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CHANCERY LANE, LONDON, W.C.2.

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EXPLANATORY NOTE

The contents of this Abridgment Class may be seen from its Subject-matter Index, which includes all index headings, subheadings, and subdivisions allotted to this Class, as well as cross-references under them, although there may be no cases affected within the period covered by this volume. A revised edition of the *Abridgment-Class and Index Key* showing Abridgment Classes and Index Headings to which inventions are assigned in the official publications of the Patent Office is now published, price 7*s*. 6*d*. *net*.

It should be borne in mind that the abridgments are merely intended to serve as guides to the Specifications, which must themselves be consulted for the details of any particular invention. Printed Specifications, price 1s., may be purchased at the Patent Office, or ordered by post, no additional charge being made for postage.

NOTE.—The Patent Office does not guarantee the accuracy of its publications, or undertake any responsibility for errors or omissions or their consequences.

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[Published 8/28].

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NAME INDEX

The names in *italics* are those of persons by whom inventions have been communicated to the applicants for Letters Patent.

ERRATUM

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CLASS 64 (ii)

HEATING SYSTEMS AND APPARATUS

[*other than* HEATING LIQUIDS AND GASES *and* SURFACE APPARATUS FOR EFFECTING TRANSFER OF HEAT]

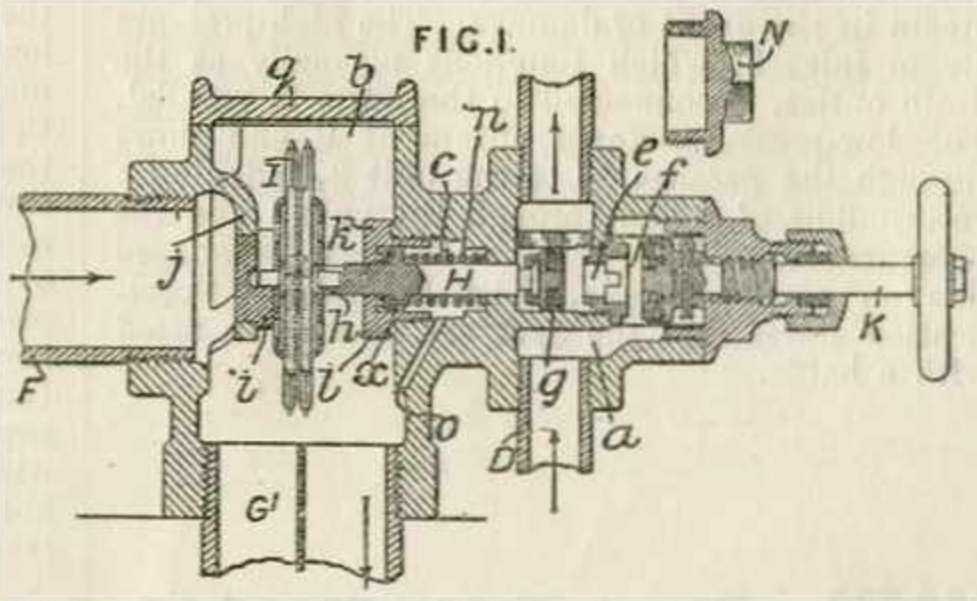
Patents have been granted in all cases, unless otherwise stated. Drawings accompany the Specification where the abridgment is illustrated, and also where the words *Drawings to Specification* follow the date.

PERIOD 1921—25

156,207. Gold Car Heating & Lighting Co., (Assignees of *Gold, E. E.*). April 29, 1918, [*Convention date*].

Thermostats. — A thermostatically actuated valve particularly applicable for use in steam heating systems or railway trains has the thermostat and valve chambers separated by an intermediate chamber provided with a leakage vent and with a seat for a valve-like packing collar on the valve spindle. The thermostat capsule I which is adapted to be withdrawn sidways when an independent cover is removed has projections adapted to engage bearings *i* and *h* formed on the casing *j* and valve spindle H respectively and is arranged in a chamber *b* between the return pipe F from the radiator and the ventilating horn G¹ and closed by a removable cover *q*. The packing-washer *l* is supported by a shoulder *x* on the spindle which also forms an abutment for a spring *n* and co-operates with a seat on a fitting *k* screwed into the chamber *c* which has a drain passage *o*. The valve member *g* is arranged in a chamber *a* in the steam-supply pipe D and co-operates with a seat member *e* which also carries a seat *f* for a manually actuated stop valve *k*. This valve may be replaced by a cap N and a separate stop valve used.

FIG. 1.



156,378. Whyte, T. B. Nov. 15, 1919. *Drawings to Specification.*

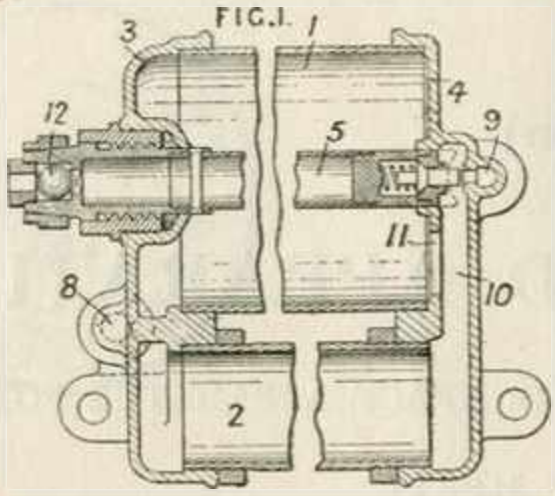
Heating ships.—Low-pressure steam is circulated through radiators &c., the flow being promoted by connection of the outlet terminals with surface condensers. The control valves may be centrally disposed, for example, in the engine-room. The Provisional Specification also describes an arrangement for by-passing the condensers and operating the system as a pressure one.

Reference has been directed by the Comptroller to Specifications 11741*/00, 9611/11, *and* 6407/12.

500. Wt. 108A/348. 2/25. C.P.Leam. Ps 2078.

[illegible],455. Westinghouse Brake Co., Ltd., and **Barty, T.** May 7, 1920.

FIG. 1.



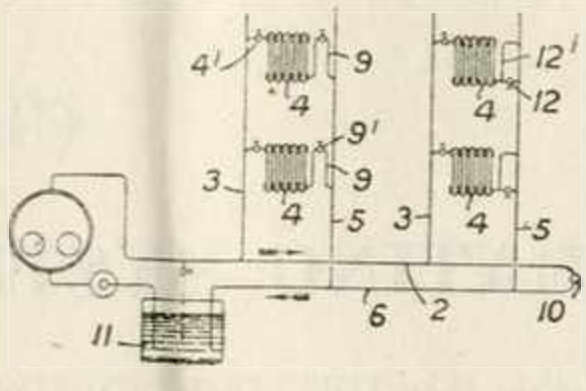
Radiators; thermostats.—Steam heating-apparatus, particularly for heating railway carriages and the like, of the kind initially heated by high-pressure steam and maintained at the desired temperature by low-pressure steam, the supply of which is controlled by a thermostat, is so constructed that the high-pressure steam, is supplied to the various units of the radiator in parallel and the low-pressure steam supply promotes a continuous circulation of steam around the units. A radiator as shown, comprises two or more units 1, 2, screwed into caps 3, 4, and a known thermostatic device 5, for controlling the supply of low-pressure steam through the orifice 9. The thermostat, the interior of which is normally open to the atmosphere, is fitted at one end with a ball valve 12 to prevent the escape of steam in the event of damage. The high-pressure steam inlet 8, which functions normally as the drain outlet, is connected to the units in parallel. The low-pressure steam enters at 9 and flows through the passage 10 to the unit 2, inducing a return flow of steam through the unit 1 and the aperture 11. The passage 10 may be shaped like an ejector nozzle. The Provisional Specification states that the aperture 11 may be fitted with a baffle.

156,773. Draper Manufacturing Co., (Assignees of *Draper, C. T.*). April 9, 1917, [*Convention date*].

FIG. 2.

Radiators.—Sheet-metal radiator sections are connected together by having the flanged edges of their registering openings clamped between a tapped ring member *e* and the flange *f* of a threaded plug member *f*, a suitable passage being formed through the latter to provide communication between the sections. The construction illustrated relates to a closure for sheet-metal barrels.

156,829. Woude, D. van der. June 4, 1919.

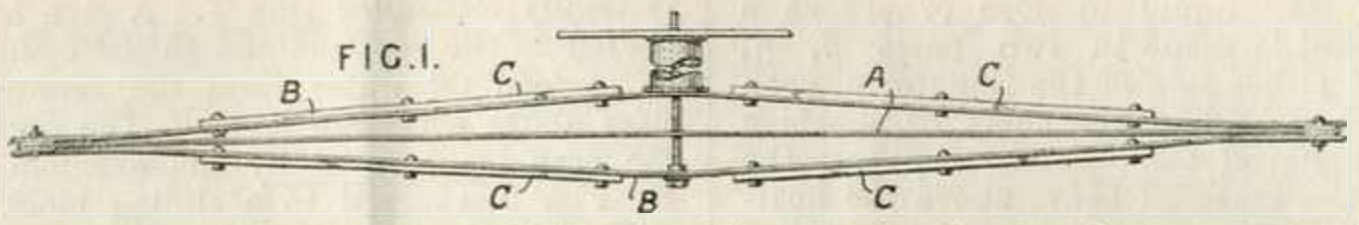


Heating by circulation of fluids.—Relates to central hot-water heating-installations of the kind in which the return pipe is used as a continuation of the supply-pipe with an interposed valve therebetween, the return pipe discharging into a tank open to the atmosphere disposed at or about the level of the heating-device, to which the water is returned from the tank by a pump. According to the invention, each radiator 4 in such a system operated at reduced or entirely free of pressure by providing the inlet pipes from the supply-pipe 3 with a valve 4 so as to restrict the volume of water admitted, while providing an unrestricted outlet discharging into the pipes 5 communicating with the return main 6. The control valves referred to are arranged in inlet pipes situated at the upper level of the radiator, and the discharge pipes 9 rise to the same height to enable the radiators to be filled. The outlet pipe 9 may be arranged as a siphon which is open to the atmosphere through the valve 9 when the radiators are in use, or a pipe 12^1 with a lower discharge pipe 12 provided with a valve may be used. To provide for a small consumption when a large number of radiators are cut off, the supply and return pipes 2, 6 are connected through a valve 10 which opens automatically more or less according to the pressure in the supply-pipe. At a time of small consumption prior to an expected increased use of hot water in the radiators, the supply-pipe 2 may be put into direct communication with the hot-water supply tank 11 through an auxiliary pipe provided with a valve. The boiler may then be fed with hot water from the tank when the system can take more than the normal quantity.

156,831. Gee, J. E. June 6, 1919.

Thermostats.—In a thermostat of the kind comprising metal strips or members having different coefficients of expansion connected together in a triangular or bow-like form, each of the arched members consists of a springy metal strip so stiffened on each side of its central portion as to leave the central portion and both of its ends flexible and resilient, the straight member being maintained taut by the tension exerted by the arched members. The arched members B are stiffened by rigid bars C secured to the members by nuts and bolts. In a modification, the stiff-

FIG. 1.



ening-bars are connected together and to the ends of the straight member A by separate flexible strips. The straight member may consist of two strips spaced apart. When the apparatus is used in an incubator, the two straight strips are arranged respectively above and below the level of the eggs.

157,029. Wasserman, S. May 28, 1920.

FIG. 9.

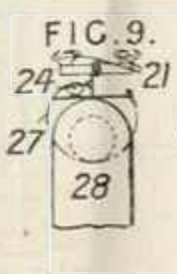


FIG. 10.

Radiators.—A heat-deflecting hood 1 resting on brackets is readily detachable and adjustable for angle when fitted to any radiator 28. Each bracket is secured by a chain 27 which passes round an upper connection between two adjacent radiator sections and is hooked at its free end over a toothed sector 24. Longitudinal rods 6 in the hood engage hooks 21 borne by each bracket. A back plate 2 may be bent outwards, as shown in Fig. 10, to meet the wall against which the radiator is placed.

157,424. Krantz, H. June 1, 1918, [*Convention date*].

FIG. 5.

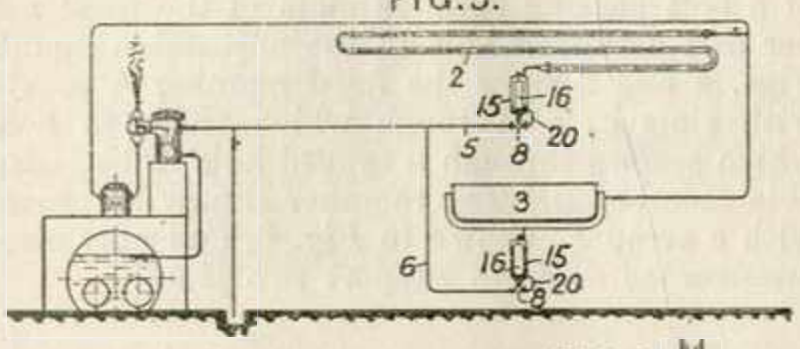
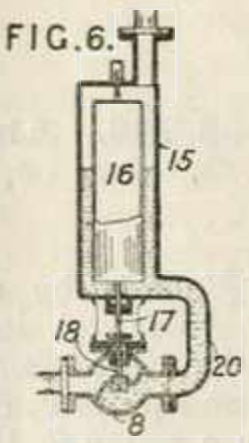


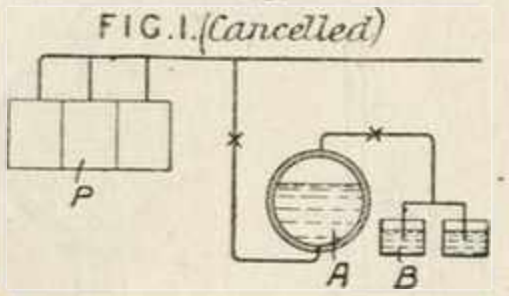
FIG. 6.



Heating by circulation of fluids.—In a steam heating-installation wherein different units such as the heating system 2 and the boiling apparatus 3 work at high and medium pressures respectively, the usual hand-adjusted throttle valve, fitted in conjunction with the non-return valve 8 in the return condensed water pipes 5, 6, to the boiler, for the purpose of equalizing the return pressure from both units, is replaced by the automatic device 15 fitted to the top of the non-return valve 8. The device comprises a chamber 15 provided with a float 16 fitted with a guide-spindle 17 which rests on the top of the non-return valve spindle 18 condensed water passing from the bottom of the chamber to the underside of the valve by the connection 20. The weight of the float is preferably equal to its buoyancy when completely immersed and the valves will automatically operate to equalize the return pressures, the heights of the water columns in the chambers 15 at any time being in the inverse ratio of the working pressures. The condensed water in the return main 5 may be returned to the boiler or to a high level tank.

157,753. Aktiebolaget Vaporackumulator. Jan. 9, 1920, [*Convention date*].

FIG. 1. *(Cancelled)*



Heating-apparatus.—The contents of a bleaching Hollander, dye vat, or like intermittingly heated receptacle are heated by steam from an accumulator containing water and receiving steam from a turbine or other steam consumer. The injector &c. for supplying the liquid to the receptacle may be operated by steam from the accumulator.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also apparatus in which the liquid in a vat &c. B is heated by steam from an accumulator A receiving steam directly from a boiler P. This subject-matter does not appear in the Specification as accepted.

Reference has been directed by the Comptroller to Specifications 6894/14 *and* 129,272, [*both in Class* 123 (ii), Steam generators], 135,474 *and* 135,479.

157,877. Deleamont, E. Jan. 19, 1920, [*Convention date*].

FIG. 1.

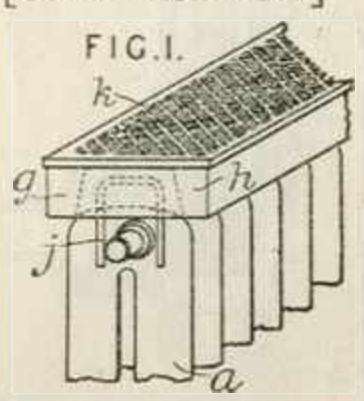
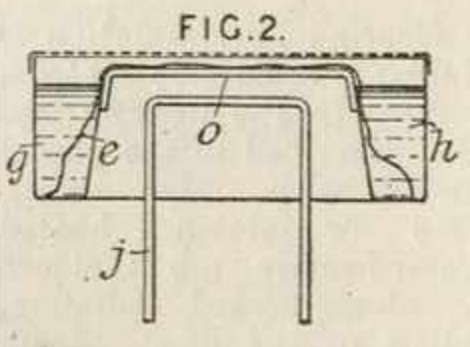


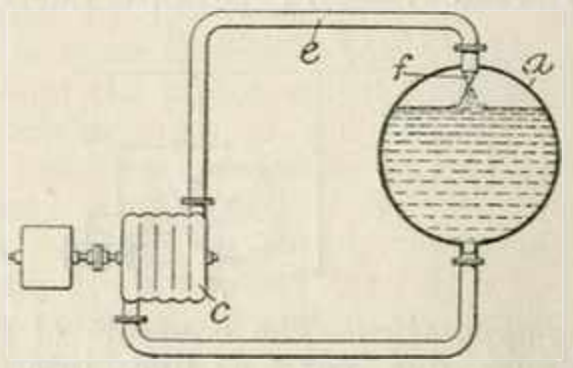
FIG. 2.



Radiators.—In a humidifier for heating apparatus such as radiators and the like, of the type comprising a liquid-containing vessel provided with one or more sheets of absorbent material dipping into the liquid and situated in the path of the hot gases, the material being such that it

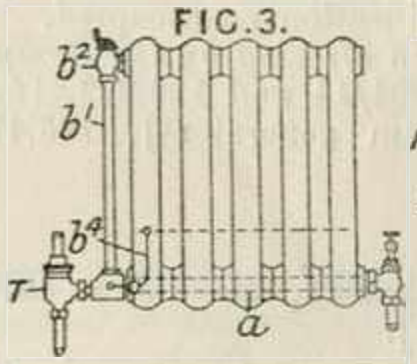
not allow the liquid to ooze or act as a syphon the vessel is made in two parts g, h, situated one on either side of the radiator a, each part receiving one end of the sheet or sheets e of absorbent material such as filter paper, the centre part of the material being above the heating apparatus. The whole structure forms a heating chamber closed at the top by the sheet of absorbent material. The end plates carry fittings j for positioning the ends, and the troughs g, h, may be fitted with a cross connection over the top of the apparatus for intercommunicating and cross bars o for supporting the sheet. The apparatus may be used in conjunction with an electrically heated contrivance with incandescent lamps instead of a radiator.

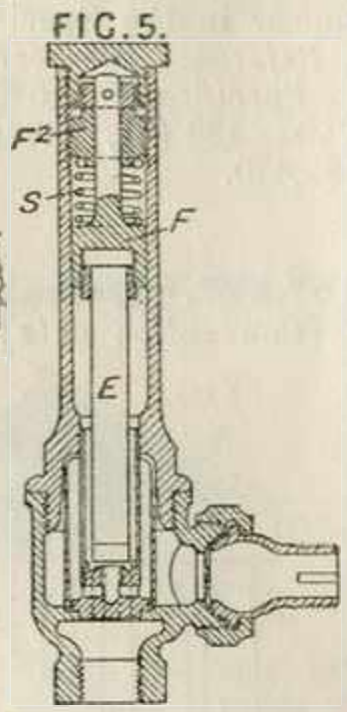
157,903. Scheitlin, E. May 17, 1919, [*Convention date*].



Heating systems and apparatus.—Liquid is circulated from a vessel a through a power-driven pump c and a delivery pipe e which is fitted with one or more throttling devices f. The liquid is thereby heated and vaporized.

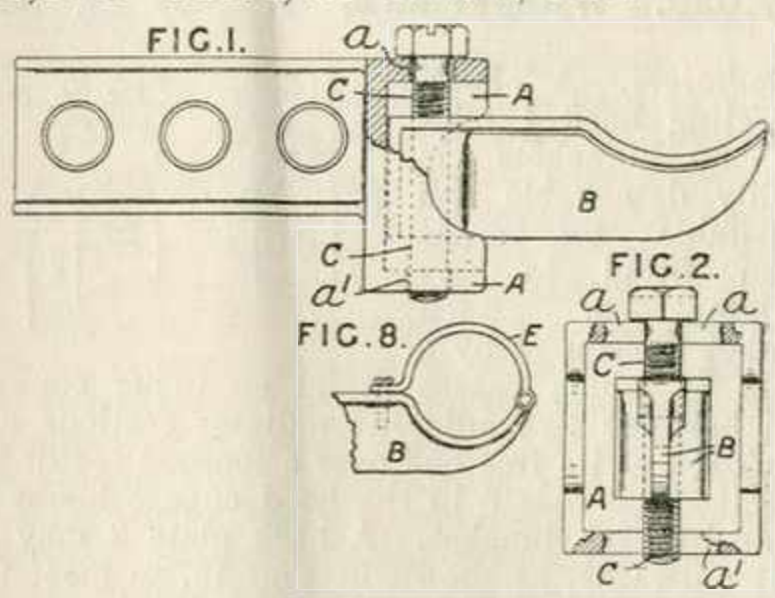
158,009. Codd, T. J., and **Johnson, H.** July 2, 1919. *Addition to* 141,107.





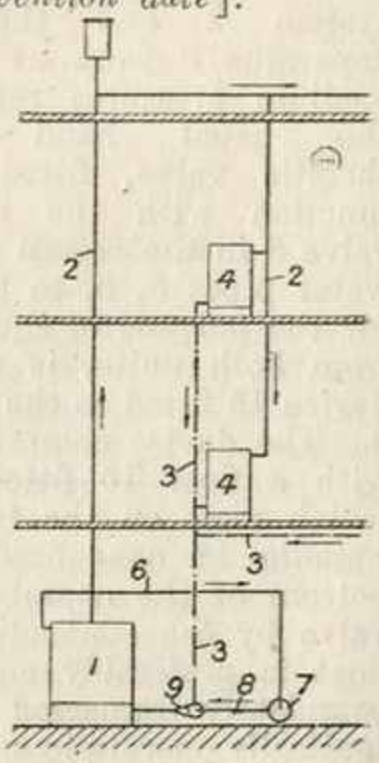
Heating by circulation of fluids; radiators; steam traps.—In the heating system described in the parent Specification, the calorifiers or steam-heated water-heaters are replaced by steam-heated radiators, rollers or the like. Steam is admitted to each radiator through a pipe a, Fig. 3, immersed in the water at the bottom of the cast iron sections, as described in Specification 163,640. The steam then passes to the top of the sections through a pipe b^1 under the control of a stop valve b^2. Water condensed in the pipe a is led off through a thermostatically controlled trap T. A pipe b^4 is so connected to the sections and to the condense outlet as to lead off water from the sections when it rises above a certain level. The outlet valve of the trap is operated by the expansion of a rod E, Fig. 5, secured to a sliding block F, as described in Specification 166,480. A spring S, between the top of the sliding block and a screwed sleeve F^2 takes up expansion of the rod after the valve has been closed.

158,379. Mort, J. Nov. 6, 1919.



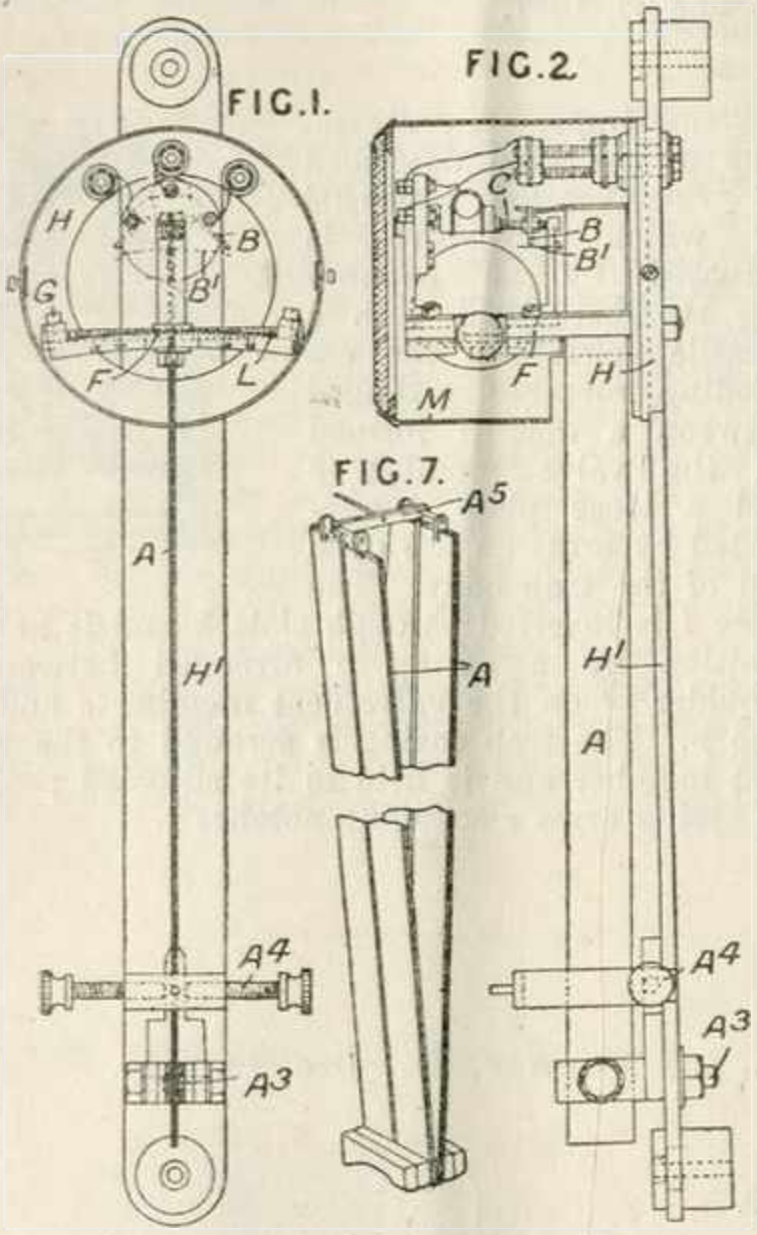
Radiators.—A support for a radiator or pipes comprises a fixed box-like member, open at the front, constructed to be built into or attached to a wall or provided with a leg and foot to stand on the floor, and supporting a movable member adjustable vertically and longitudinally by means of a bolt passing through slots in the fixed member and a tapped hole in the adjustable member. Figs. 1 and 2 show the fixed member A provided with slots a, a^1 through which passes a bolt C which screws through a tapped hole in the adjustable member B. The member B may be provided with a strap E, shown in Fig. 8, and may also be constructed so as to support two pipes.

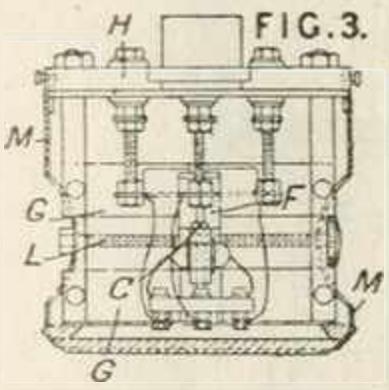
158,866. Lincke, A. R. M., and **Lincke, O.** Jan. 30, 1920, [*Convention date*].

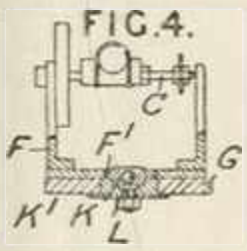


Heating by circulation of fluids.—A local circulation through the boiler 1 and pipes 6, 8 is set up by a pump 7, the flow of water through the main system 2, 4, 3, being accelerated by the ejector action on the return pipe 3 in the device 9. If the mechanical circulation fails, the system works on the usual gravity method.

158,931. Grundy, H. H. Oct. 8, 1919.



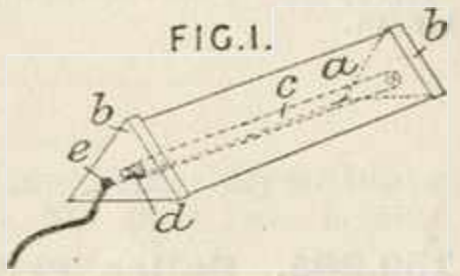




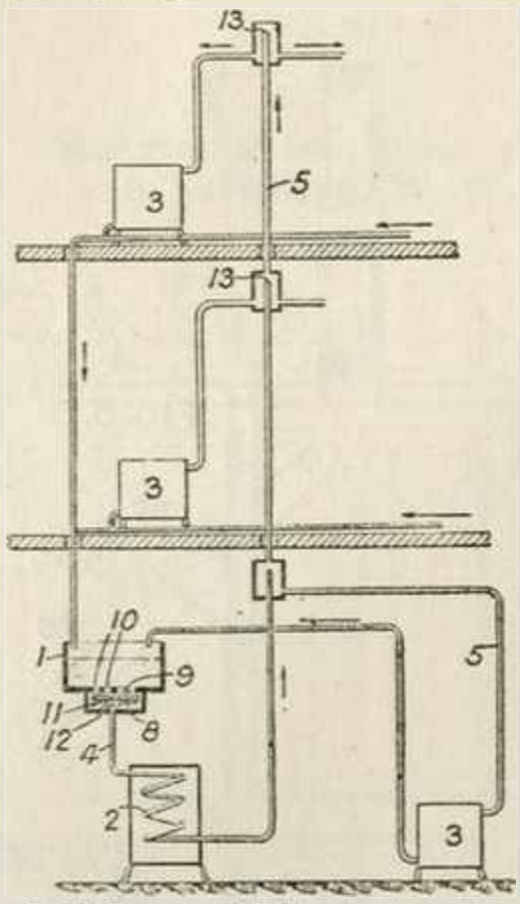
Thermostats.—Relates to thermostats of the type described in Specifications 5311/12 and 110,938, in which an operating-member A, Figs. 1 and 2, composed of one or more bi-metallic strips is adapted to actuate a rocking-switch B controlling the heating or cooling means. In order to obtain a better regulation of the temperature at which the thermostat responds, both the rocking-switch and the bi-metallic strip are capable of adjustment independently of each other, the coarser adjustment of the bi-metallic member being obtained by pivoting it at A^3 on a supporting-bar H^1 and by operating screws A^4 bearing upon the sides of the member A, and the finer adjustment of the rocking-switch B being obtained by mounting the switch on a carrier F slidable in a slotted curved plate G, Figs. 3 and 4, and operated by means of a rotatable threaded rod L engaging a nut K on the carrier. In order to allow the switch to move in a curved path while the nut K traverses a straight path, the nut is provided with trunnions K^1 engaging slots F^1 in the carrier. The rocking-switch is pivoted on a spindle C on the carrier, and a stop B^1 is mounted on the carrier to limit the movement of the switch in either direction. The support H for the plate G and rod L is in the form of an annular member supporting a cylindrical casing M having apertures for the passage of the strip A and rod L, the various apertures facilitating circulation of the air around the switch. The strip A is preferably surrounded by a casing carrying a thermometer. In place of a single bi-metallic strip A, two strips A, Fig. 7, connected at their lower ends and normally splayed apart at their upper ends, but held together under tension by a connecting-piece A^5, may be employed. The two strips A may either be straight or substantially **U**-shaped or coiled in reverse directions, the metals being so arranged that the free ends tend to move in the same direction under variations of temperature.

158,938. Thomas, B., and **Thomas, E.** Oct. 14, 1919.

Footwarmers.— A foot- or bed-warmer comprises a triangular metal casing *a* without perforations, closed at the ends by earthenware or like fitting *b* between which a central rod *d* carrying the heating element *c* is supported. The electric conductors pass through a hole *e* in one end. The casing is well spaced from the heating element.



159,178. Mennesson, G. Feb. 20, 1920, [*Convention date*].



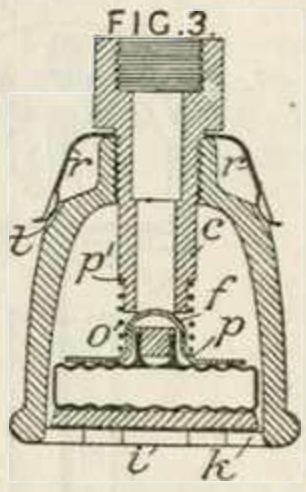
Heating buildings.—Relates to steam or hot-water heating-installations of the type comprising an instantaneous steam generator 2 supplied with water from a supply reservoir 1 through a connecting-pipe 4 provided with a valve which is controlled automatically by the pressure variations in the generator. According to the invention

the valve 8 is arranged to move vertically and when open to leave only a small passage, for example, one millimeter in width, between itself and the seat 9 for the escape of gas and air from the water during the heating operation and to be closed only when the steam pressure causes a rapid backward flow of water from the generator to the reservoir. Preferably the valve is constituted by a flat disc 8, which is guided on a central rod 11 having a limiting shoulder 12, and co-operates with a number of small apertures 10 on the bottom of the reservoir. A number of steam-separators 7 are arranged in the heating-system, in the upper parts of which the inflow pipes 5 open at 13 and from the lower parts of which are taken the pipes leading to the radiators 3, the arrangement preventing back-flow of water from the radiators to the generator. In the case of rapid heating in the generator, the heating of the radiator is almost entirely by steam; in the case of slow heating in the generator, by hot water forced through the system by steam.

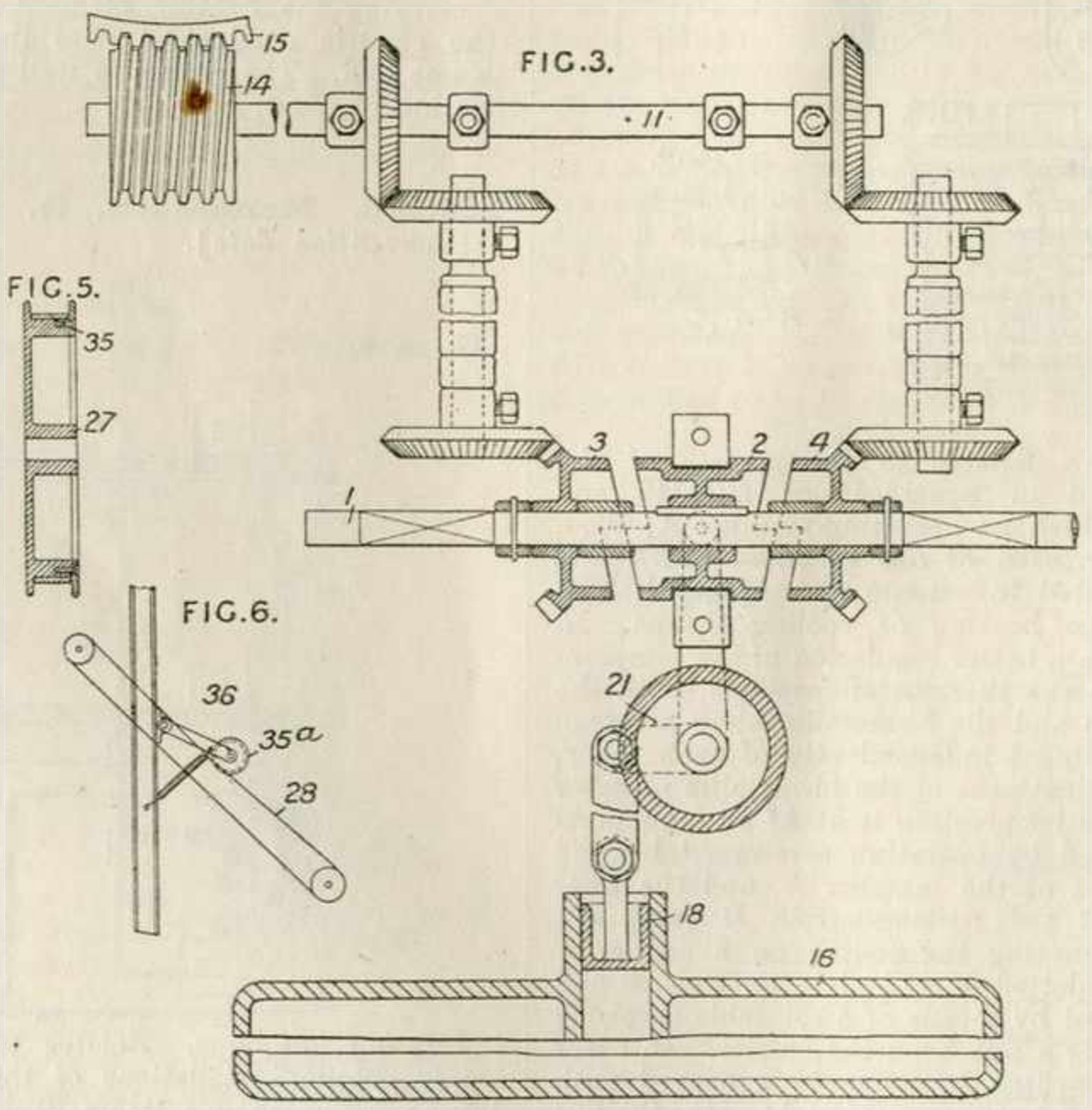
159,226. Cleland, J., and **Stewart, J. C.** June 28, 1917.

Steam-traps.—A steam-trap of the kind described in Specification 9632/03 in which a valve is actuated by an expanding member filled with a volatile spirit has the expanding member arranged between a disc *p* formed on the valve member *c* and a loose plate *i* supported by arms on the open end of the trap body. The plate *i* is inserted through slots *k* and is held in position by a spring *o* arranged between a shoulder p^1 on the valve seat member *c* and the disc *p*. The trap casing is screwed to the valve seat member and is held in its adjusted position by spring arms *r* engaging notches *t*.

FIG. 3.



159,365. Calico Printers' Association, Ltd., and **Turner, G.** Dec. 12, 1919.



Thermostats.—Relates to thermostats for operating valves or equivalents regulating the flow of heated fluids or the admission or emission of air or gas at any desired temperature, and consists in using a piston &c. operated by the expansion of mercury for mechanically moving a

double clutch slidably mounted on a continuously-rotary shaft whereby bevel or like wheels give the required motion to a shaft actuating the valve spindle &c. A mercury vessel 16, Fig. 3, has a plunger 18 connected to a lever 21, the other arm of which is adapted to slide a claw clutch 2 on the continuously rotating shaft 1. The clutch can engage the freely-mounted bevel-wheels 3 or 4 which drive through other gearing a shaft 11. A worm 14 on the shaft 11 drives a worm-wheel 15 which actuates the valve spindle. As the mercury expands or contracts with temperature changes, the plunger 18 moves and actuates the valve to restore the temperature to normal. The shaft 1 is driven by a belt, which should be capable of temporary slipping at the moment of engagement of the clutch for this purpose a jockey pully 35[a] Fig. 6 on a spring-held pivoted arm 36 may be used to tension the belt 28; or one of the belt pulleys 27 may have a frictionally held roller or band 35, Fig. 5 adapted to slip with the belt but normally rotating with the pulley. The apparatus is described for use in an ageing-plant for textiles.

159,560. Pickup, H. Nov. 21, 1919.

FIG. 2.

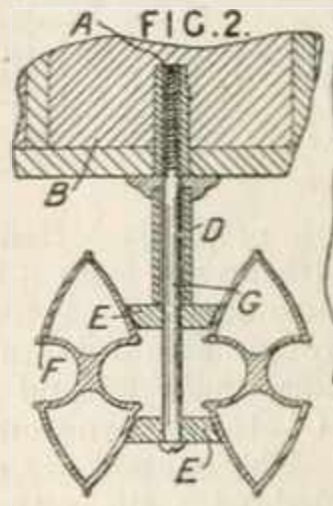
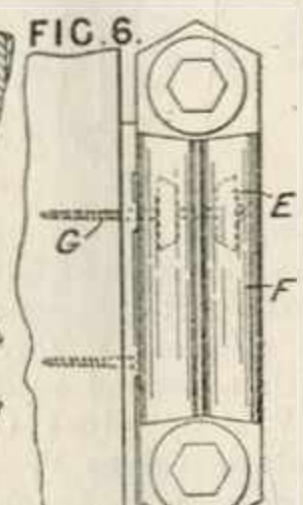


FIG. 6.

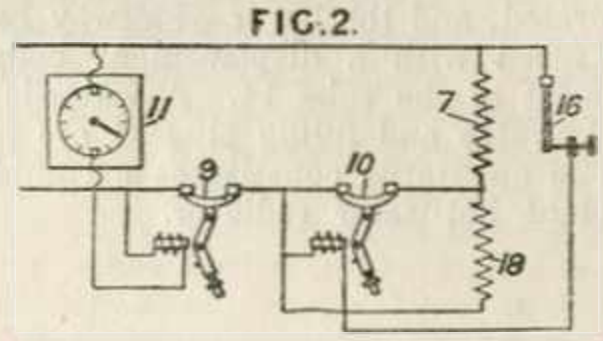


Radiators.—A clip for fixing radiators to walls, &c. comprises a plug A fitting into a hole in the wall B, a tubular distance-piece D and a pair of snugs E fitting between the sections F of the radiator, the whole being held by a screw G passing through into the plug A. The distance-piece D may be formed as a bracket to bear against the wall and support the radiator. In the modification shown in Fig. 6, a bracket L takes the weight of the radiator and in this case one of the snugs E may be formed integral with the bracket.

159,871. Metropolitan-Vickers Electrical Co., Ltd., (Assignees of *Forshee, F. F.*). March 1, 1920, [*Convention date*].

Thermostats.—Relates to a method of automatically controlling the supply of energy to electrically heated cooking-ovens. In series with the usual main heating resistance 7, the current through which is controlled by the usual clock 11 and switch 9, is an auxiliary high resistance heating coil 18 the current through which is controlled by a thermostat 16 and switch 10. Normally the switch 10 is closed and the thermostat

FIG. 2.



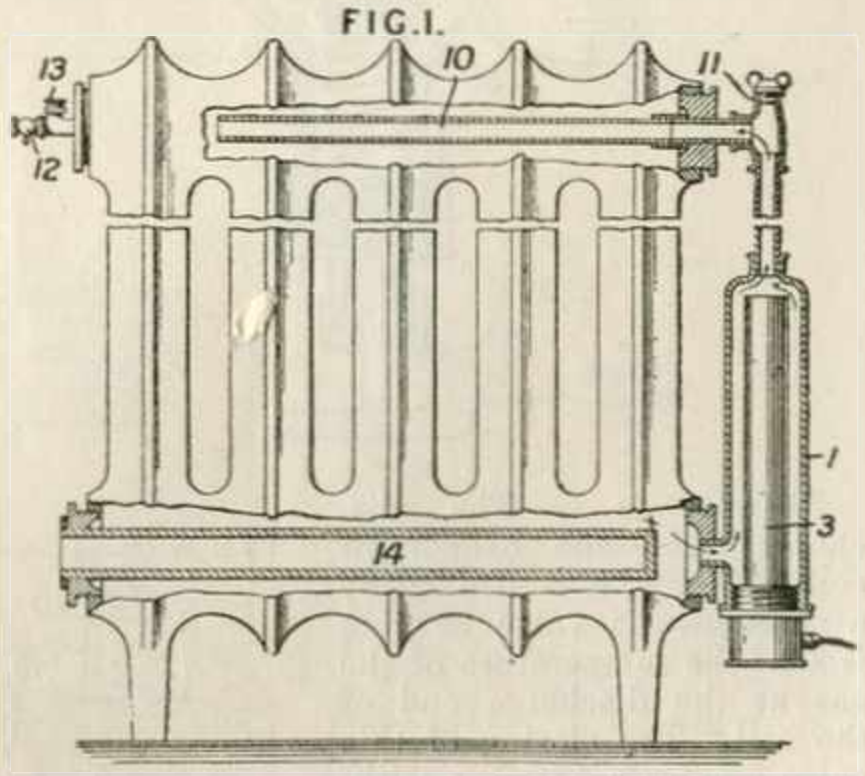
contact is open. When a desired temperature is attained the thermostat closes the control circuit, opens the switch 10, and so reduces the supply of energy just sufficiently to maintain that temperature for any desired length of time. The switch 10 may be re-closed either automatically or by hand.

159,965. Nitro-Fixation Syndicate, Ltd., and **Jenkins, H. C.** Dec. 6, 1919. *Drawings to Specification.*

Non-conducting coverings for heat.—Heat radiation is prevented from a cylinder or annular channel &c. by causing a fluid to pass through a spiral passage or a plurality of spiral passages arranged concentrically with the cylinder &c. Specifications 9815/94 and 24404/01 are referred to.

160,111. Norris, F. A., (*trading as* Norris & Co., F. A.), and **Dutton, H. W.** July 5, 1920.

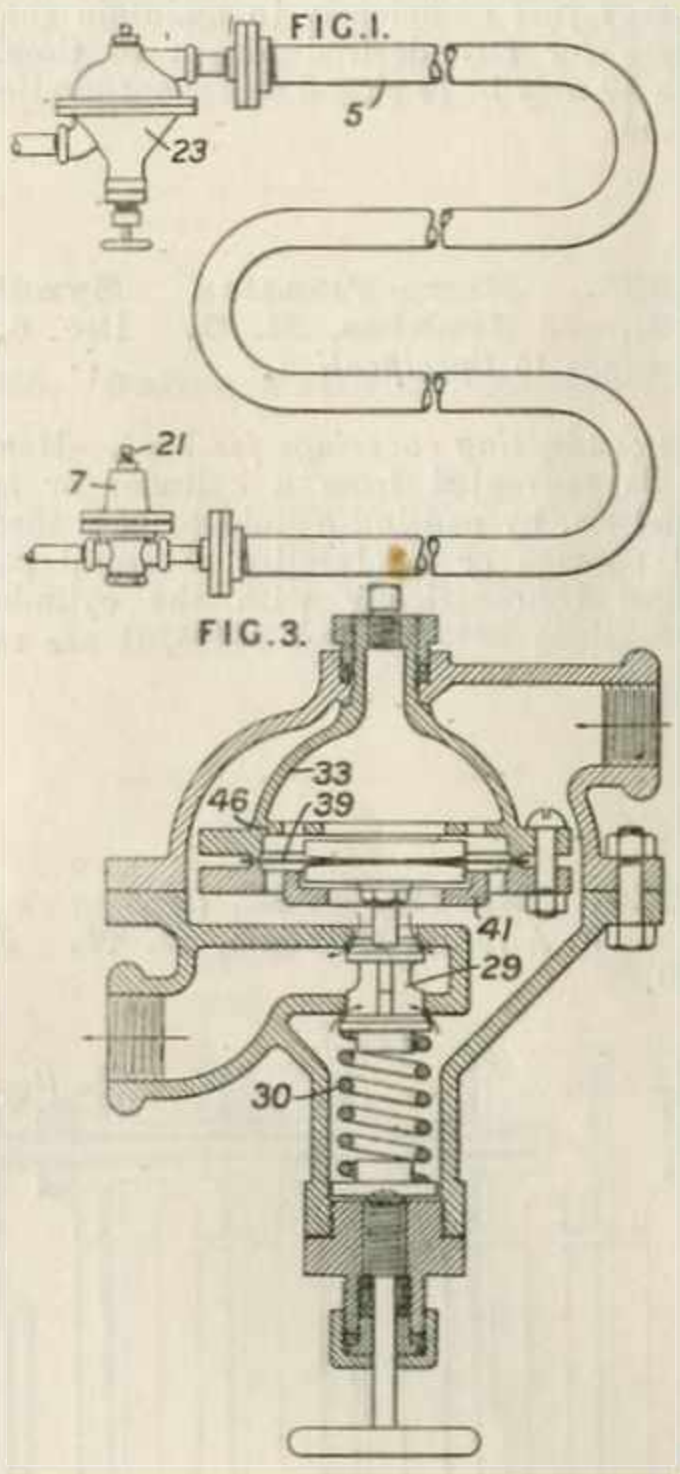
FIG. 1.



Radiators.—Hot-water circulating-radiators and like heating-apparatus such as towel rails &c. and

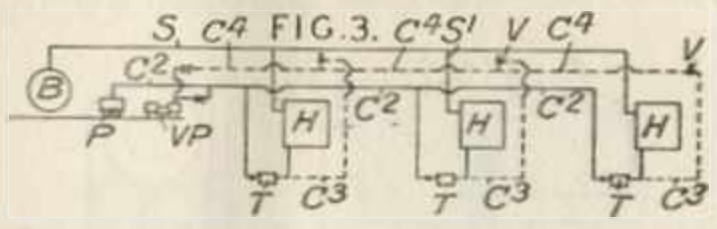
containers for warming water for domestic and other purposes, are fitted with an exterior heating-chamber 1 provided with an electric immersion heater 3, the chamber being connected to the upper and lower waterways, the upper waterway being provided with a distributing pipe 16, open at the ends and the walls of which may be perforated, and the lower waterway being preferably fitted with a displacement body which may consist of the tube 14. A water-level cock 12, safety-valve and filling plug 11 are provided. The whole apparatus constitutes a complete and independent hot-water radiator.

160,233. Wegner, G. A. Dec. 10, 1919.



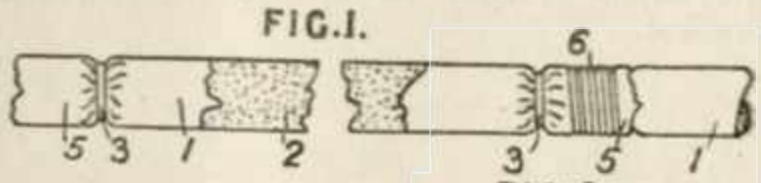
Thermostats. — The discharge from the evaporator coil 5, Fig. 1, is controlled by a thermostatic valve 23 subject to the temperature of the gas at the discharge end of the coil. The closing of this valve creates a pressure within the coil to close a pressure-actuated valve 7 controlling the supply of liquified gas to the coil, the arrangements serving to prevent the passage of saturated or unevaporated refrigerant to the compressor. A suitable pressure-actuated valve is shown in Fig. 5. The inlet valve 10 is pressed to its seat by a spring 11 located within a piston 12, but is normally maintained in an open position by a spring 20 acting through a diaphragm 16 and plates 19, 17. The spring 20 is adjustable by means of a screw 21 and is set to give a particular pressure within the evaporator. One form of thermostatic valve, Fig. 3, comprises a chamber 33 within the valve casing filled with ammonia or other expansible liquid, the base of the chamber being formed by a diaphragm 39. The gas returning to the compressor passes around this chamber on its way to the outlet valve 29, which is pressed to its seat by an adjustable spring 30. The movement of the diaphragm is limited by plates 41, 46. In a modification a bellows form of thermostat is employed.

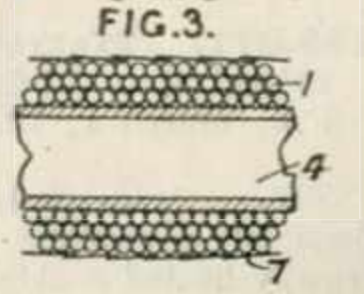
160,389. Codd, T. J., and **Johnson, H.** June 21, 1920.



Heating by circulation of fluids.—Heaters or radiators H supplied with steam from a boiler B by mains S, S¹ are connected with a return main C^2 and receiver P through steam traps T and also with a second return main C^4 and vacuum pump VP, by pipes C^3 through automatic or thermostatic valves V. The heaters are operated under pressure, connected with the return main C^2 or vacuum when connected with the main C^4. The change over may be effected by hand control of valves or may be made automatically according to the temperature of the condensate. Specifications 137,571, 158,009, and 166,480 are referred to.

160,453. Mellgren, O. J. March 18, 1920, [*Convention date*].

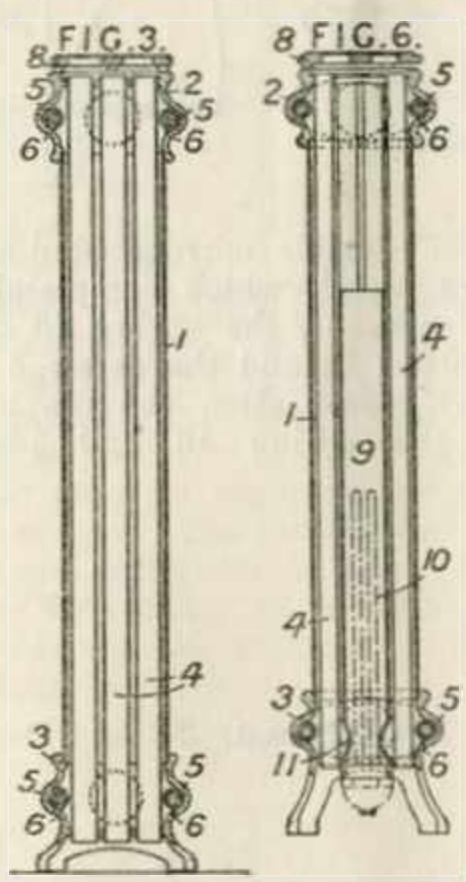




Non-conducting coverings for heat. —An insulating covering for steam-pipes, boilers, pumps, &c. comprises a flexible hose 1 of cloth or the

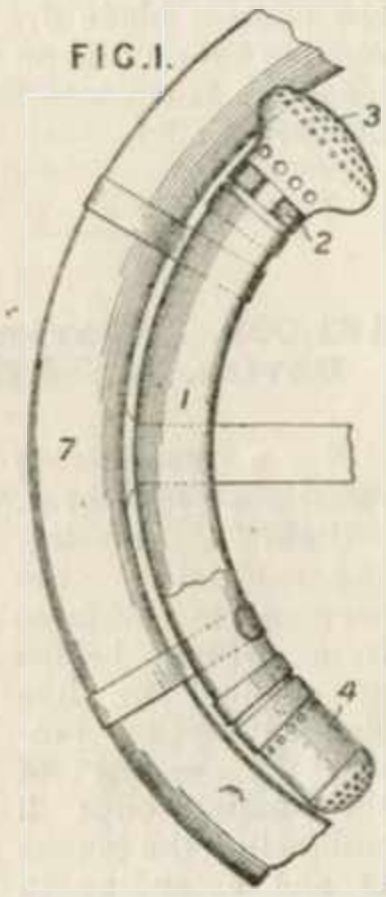
like adapted to be filled with fine-ground bark of pine as an insulating material and to be wrapped round the pipe 4 in one or more layers. Before wrapping, the filled hose is preferably dipped into water-glass or a similar coating-solution. In order to join two sections of hose, the ends of one section are tied at 3 leaving empty extreme portions 5 which are passed over the filled ends of the adjacent section and secured by a cord 6. The wrapping is preferably covered by an external binding 7 which is also coated with a protecting-material such as water-glass or oil-paint.

160,671. Scarlett, A. E., Laundy, P. H., and **Bell, A.** April 6, 1920.



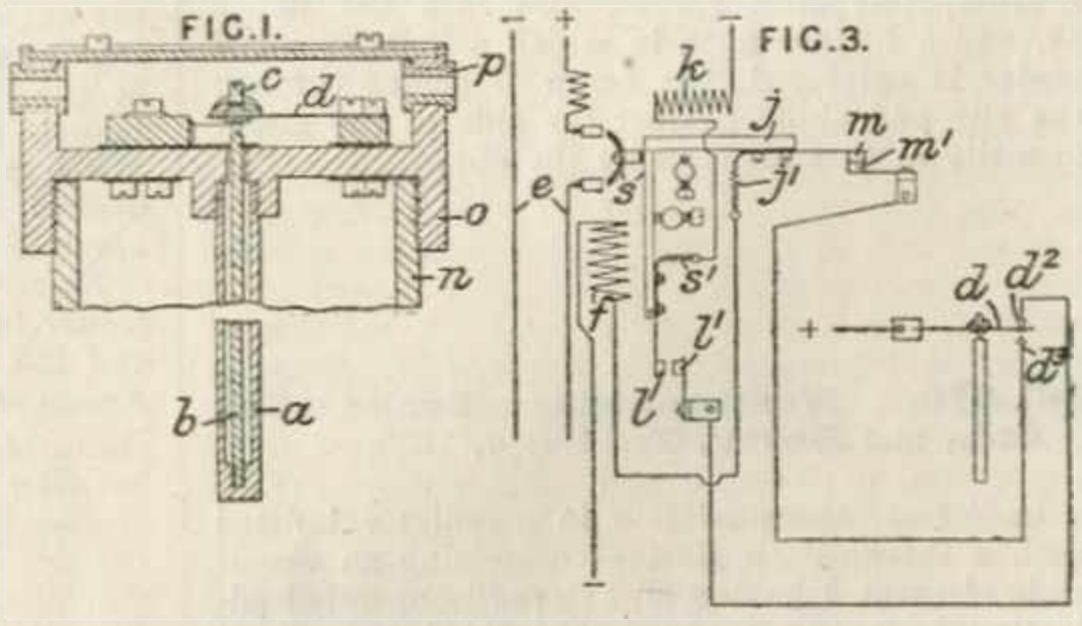
Radiators.—A radiator for heating buildings is provided with inner tubes within the radiating tubes, through which air is circulated. Water or low-pressure steam is circulated through the radiator, or it may be heated by gas or electricity. Tubular metal pipes 1 are mounted in headers 2, 3, and contain smaller tubes 4 which are expanded into the headers, allowing a free passage for air. The units are coupled together by bolts 5 passing through the headers, and the bolts are protected from corrosion by surrounding tubes 6 of non-ferrous metal. The air cap 8 may be provided with a rotating shutter to regulate the draught of air. When electric heating is employed, the resistance element may be placed in an enlargement of the bottom header, or it may be placed in a chamber 9, Fig. 6, which replaces some of the air-tubes. Ports 11 may be provided to allow the water to circulate around the resistance element 10.

160,695. Martin, J. Walter-. June 2, 1920.



Heating by chemical action.—A heater for the steering-wheel 7 of a motor car &c. comprises a curved tube 1 filled with cotton wool &c. soaked in petrol, the ends of the tube being fitted with plugs 2 containing platinated asbestos. End caps 3, 4 are provided.

160,842. McNeil, A. H. Feb. 26, 1917.

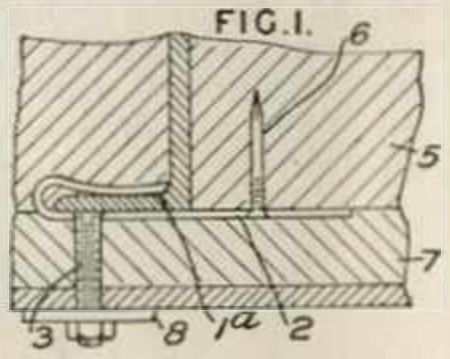


Thermostats.—An apparatus for controlling temperature, such as the high temperature of a muffle furnace or an electrically heated induction pipe of an aircraft engine, comprises a thermostat of the type in which an expansion element operates an electric switch in combination with an electric system of control as shown in Fig. 3. In this system, the main heating-circuit *e* is adapted to be closed against the action of a spring s^1 by a switch *s*, controlled by a relay *f* and adapted to be locked in the closed position by a locking-arm *j* controlled by a spring j^1 and a relay

k. The relays *f*, *k* are arranged in an auxiliary circuit and controlled by contacts d^2, d^3 co-operating with a contact blade *d* operated by the thermostatic element. In the position shown, a rise in temperature has brought the blade *d* into contact with the contact d^2 and the heating-circuit *e* has been opened. When the temperature falls until the blade *d* and contact d^3 meet, a circuit will be closed through contacts *m*, m^1 and the relay *f*, thus closing the heating-circuit *e* and allowing the spring j^1 to pull down the locking-arm *j* and separate the contacts *m*, m^1 and close the contacts *l*, l^1. If the circuit through the relay *k* is energized and the locking-arm *j* is raised, thus opening the main heating-circuit, separating the contacts *l*, l^1 and closing the contacts *m*, m^1. The thermostatic element comprises an outer tube *a*, Fig. 1, having a relatively high coefficient of expansion and an inner rod *b* of smaller expansibility and, in applying it to the induction pipe *n*, while the free end *f* the rod *b* abuts against an adjustable screw *c* carried by the contact blade *d*. The screw *c* has a pointer moving over a dial on the blade *d*, and the electric leads are taken into the cap *o* through insulating-brushes *p*.

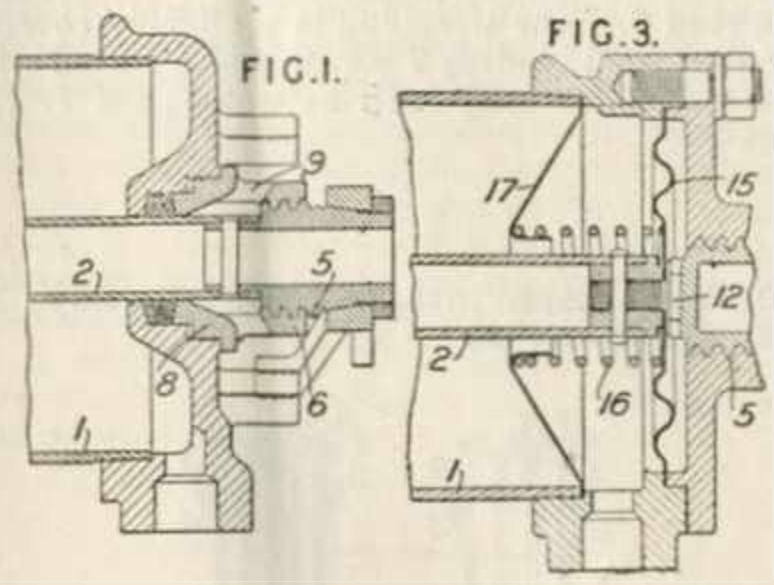
161,038. Davies, J., Jones, W. H., Davies, J., and **Hale, H. J.** Feb. 13, 1920.

Non-conducting coverings for heat.—Slabs of insulating-material are secured to surfaces from which beams of channel or like flanged section project by means of sheet-metal clips 2 embracing the flange 1^a and extending in the opposite direction. Nails 6 pass through the tail of the clip into the inner cork slab 5. The secondary layer of insulating-slab 7 is secured by means of washers 8 screwing on to studs 3 attached to the plate of the clip at the hooked end. In a modification, this stud screws also into the flange 1^a, and a further form in which a bulbous-edged girder is employed, the screw 3 passes through the clip and abuts against the side of the girder opposite to that engaged by the clip.



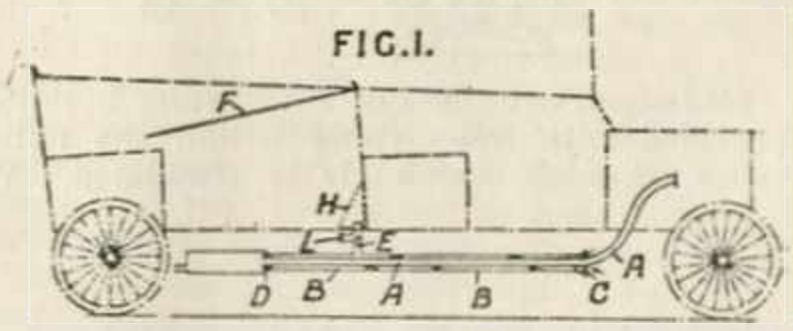
161,079. Westinghouse Brake Co., Ltd., and **Barty, T.** May 7, 1920.

Radiators; thermostats.—In a radiator 1 fitted with a thermostatic device comprising an extensible element 2 having an externally operated adjusting-device 5, means are provided to prevent access of steam from the interior of the radiator to the adjusting-device. In one arrangement the adjusting-screw 5 engages a screwed collar 6 formed as an extension of the gland 8, but separated from it by the webs 9, which allow any slight steam leakage to escape without condensing on the screwed portion 5. In a modification, the adjusting-screw 5 engages a button 12



attached to a flexible corrugated diaphragm 15, preferably of metal, which completely seals the end of the radiator, the spring 16 operating to keep the button 12 and the screw 5 in contact. In a further modification the diaphragm 15 is plain and the spring 16 and plate 17 are omitted.

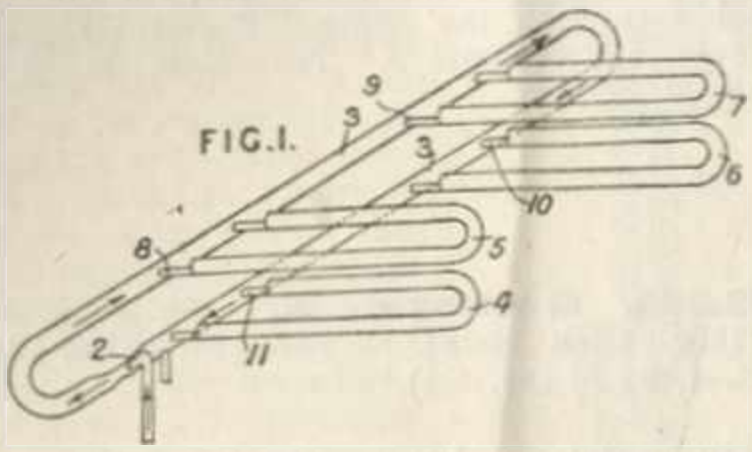
161,239. Muirhead, J. A. Dec. 29, 1919.



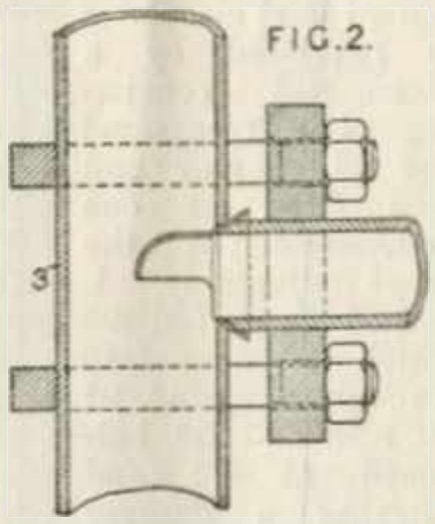
Footwarmers.—Relates to means for heating a motor car body by utilizing the waste heat in the engine exhaust pipe and consists in surrounding the exhaust pipe A with a pipe B, Fig. 1 open at the front C and closed at the rear D with a branch pipe E leading to a perforated box H. When the heat is not required, a valve L is opened. To conserve the heat in the body an apron F is provided.

Reference has been directed by the Comptroller to Specifications 7797/12, 580/13, 111,003, *and* 129,888, [all in *Class* 79 (iii), Motor vehicles, Arrangement &c. of parts of].

161,563. Pintsch Akt.-Ges., J. April 10, 1920, [*Convention date*].



Heating vehicles.—Steam circulates in an annular conduit 3 from a jet 2. Heaters 4 - - 7 are arranged along the circuit, scoops being fitted to lead the steam into the inlet connections 8 - - 11 of the heaters and also to produce a suction on the outlets. The inflow of steam to any particular heater may be regulated by altering the angle of the scoops. The heaters are arranged in pairs in the compartments as to exert a uniform heating effect by placing, for example, the heater 5 which is nearest the steam inlet 2, with the heater 4 which is furthest from it.

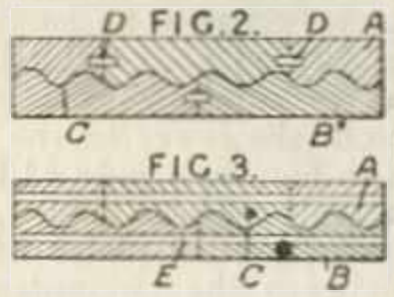


161,797. Roux, E. V. March 4, 1920.

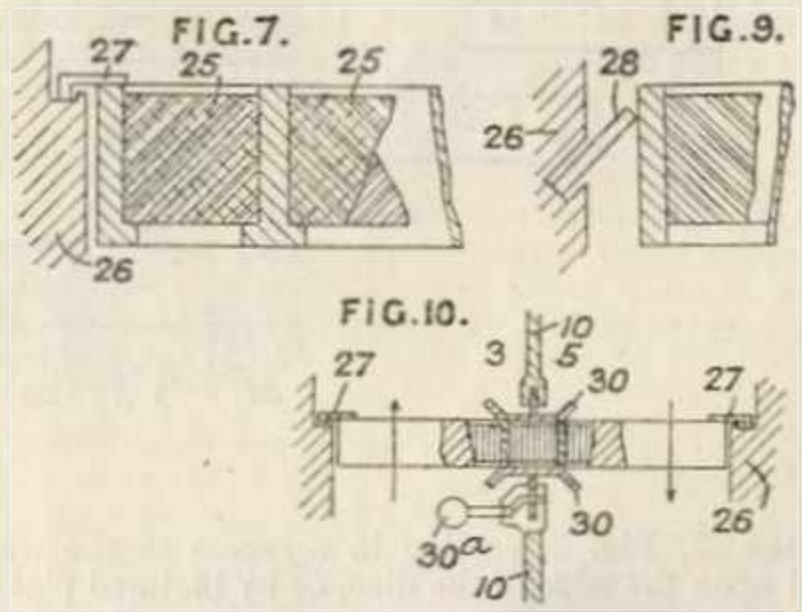
Non-conducting coverings for heat.—A building element or block suitable for the walls of refrigerating-chambers is formed of chopped-up tubular or pithed vegetable substances such as reeds, bamboo or the like E, bound together by a binding-agent F such as cement, either pure or mixed with clay, wood, sawdust or powdered cork. A reinforcement of metal or vegetable material may be used. Crossed rows of vegetable tubes or stems C are shown.

162,033. Cuthbertson, J. Jan. 2, 1920.

Non-conducting coverings for heat.—An insulating slab A, constructed of plastic material such as granulated cork mixed with a bituminous compound has one side B smooth and the opposite side C formed with ridges, recesses, corrugations, or projections so that two such surfaces will interlock when cemented together. The slabs break joint and may be keyed together by pins D, Fig. 2, while holes E, Fig. 3, may be made through the slabs for lightening them and to act as air spaces. Specification 1879/94, [*Class* 36, Electricity, Conducting &c.], is referred to.

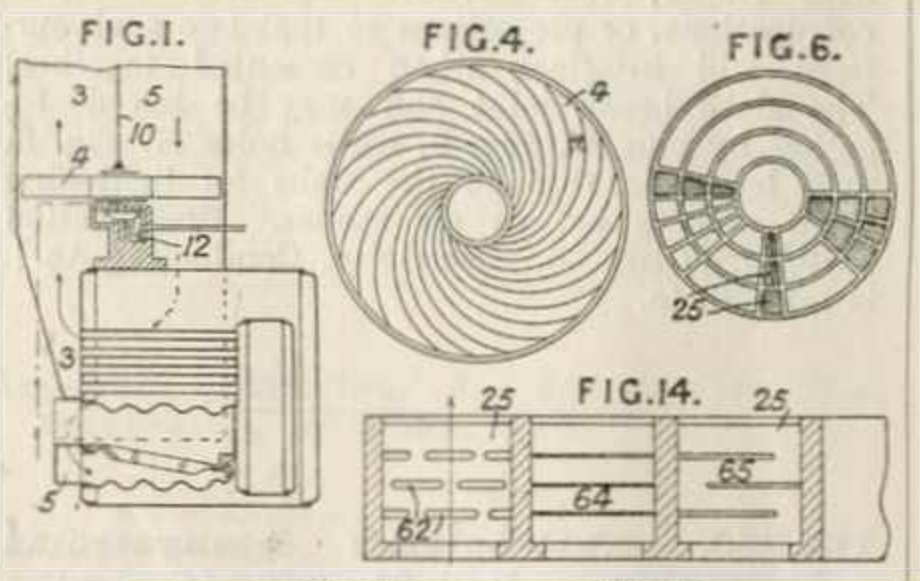


162,250. Aktiebolaget Ljungströms Angturbin. April 23, 1920, [*Convention date*].



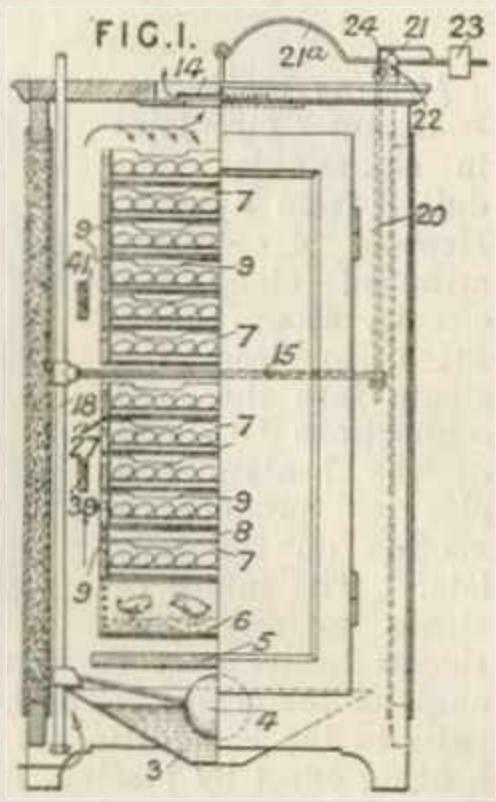
Heat-storing apparatus.—Relates to apparatus for transferring heat from one gas or liquid to another as from furnace gases to air for combustion, from the foul air of a room to fresh air for ventilation, or from warm to cold water when changing the water in swimming-baths, in which the two fluids are passed alternately through the same passages in a movable mass of regenerative material. The apparatus consists, in one form, of a rotating disc 4, Fig. 1, arranged in the path of the furnace gases escaping from a boiler through the uptake 3, and of the air for combustion passing to the furnace through the con-

parated from the uptake by a partition 10. The disc is rotated by gearing 12 and is provided with radial plates, ribbed or corrugated, forming passages for the air and gases. Preferably the plates are arranged parallel to one another, and they may be radial, or curved as shown in Fig. 4. The disc may be divided into compartments by radial and circular ribs, as shown in Fig. 6, the compartments being provided with parallel plates 25 arranged radially or circumferentially. As shown in Fig. 14, the plates 25 may be perforated or slotted, as shown at 62 and 65, or sub-divided, as shown at 64, so as to minimize or prevent conduction of heat from the lower to the upper parts of the plates. The compartments of the disc may be filled with gravel or loose stone, slag, or tiles supported on perforated plates 36, Fig. 15. Sealing-means between the circumference of the disc and the stationary wall 26 surrounding it are provided by



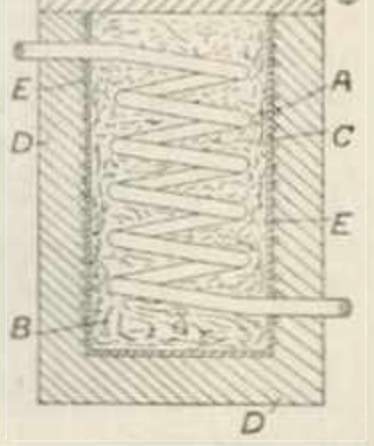
plates 27, Fig. 7, resting in a recess in the wall and upon the edge of the disc, or by inclined plates 28, Fig. 9, resting in a recess in the wall and on the disc. To prevent the passage of gases between the partition wall 10 and the discs, slides 30, Fig. 10, are provided on the partition and adapted to bear against the disc by gravity and by a weight 30^a. Perforated steam pipes may be arranged above and below the disc for removing soot. For ventilating rooms, the disc 4 is rotated in an aperture in the wall 50 so as to transfer the heat from the foul air forced through the the conduit 3 by the fan 55 to fresh air forced through the conduits 5 by the fan 56. Preferably, the disc is stationary and the conduits 3 and 5 are rotated about the centre of the disc. A modification is shown in Fig. 11 in which plates 25 are arranged to form a cylinder which is rotated so that the plates 25 are exposed alternately to hot gases passing through the channel 3 and air passing through the channel 5. The plates 25 may be inclined.

162,294. Güttinger, H. April 26, 1920, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*].



Thermostats.—An incubator in which heated air circulates is regulated by a thermostat consisting of a compound bar 15 of zinc and iron fixed at one end, and at the other adjustably attached to a rod 20 which is connected through a spring 21 to a lever 21^a balanced at 22 and carrying a damper 14 and counterweight 23. The temperature is adjusted by means of a screw 24 which bends the spring 21 and is turned to raise or lower the rod 20 relatively to the lever 21^a. The damper 14 is located in a recess in the wall of the incubator in order that it may be maintained at a sufficiently high temperature to prevent condensation thereon.

162,628. Durando, G. Feb. 27, 1922.



Heat-storing apparatus.—Steam is generated in a coil A immersed in a substance B which melts and accumulates heat at the temperature correcponding to the desired steam pressure, and which is heated by an electric resistance E. The substance may be a metal, a metal alloy, a salt, a hydrate or an oxide. The receptacle C has a non-conducting covering D. The water may be supplied to the coil in drops, steam being generated instantaneously.

163,085. Clorius, A. V., and **Clorius, O. T.** Jan. 13, 1920.

Thermostats.—Relates to thermostats of the type in which a liquid enclosed in a reservoir *i*, Fig. 1, is adapted, on expanding, to act upon a currugated flexible membrane *f* or upon a piston so as to control the movements of a valve *b* regulating the heating-apparatus of a building &c. According to the invention, the reservoir *i* is provided with a piston *p*, the position of which in the reservoir is adjustable by means of a screw *s* and a spring *t*, the initial tension of the spring being greater than the friction of the piston against a washer *o*, and the piston serving to fill the apparatus and to act as safety member against accidental overheating. The washer *o* is held in place by a closure *q* so as to form a water-tight joint with the piston *p*, and the screw *s* preferably engages an opening in one of the removable supports *l* of the apparatus. The piston in the construction shown in Fig. 1 is hollow and provided at its lower end with lateral openings *u* so that the apparatus can be filled by removing the support *l* and withdrawing the piston until some of the openings *u* come above the washer *o*. When the apparatus is in operation any accidental overheating after the valve *b* has closed causes the piston *p* to be driven upwardly against the action of the spring *t*, and in exceptional cases the openings *u* may finally come above the washer *o* and permit a leakage of the liquid. The temperature at which the valve *b* closes may be varied by adjusting the initial position of the piston by the screw *s*. In a modification, a solid piston is employed and during its insertion in the reservoir leakage is permitted between it and the washer *o*, which is arranged between two discs so that it can subsequently be compressed to form a tight joint upon the piston.

FIG. 5.

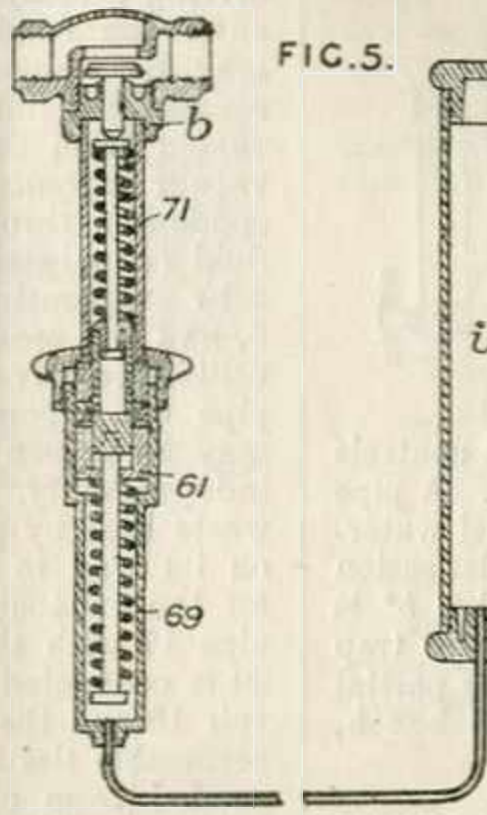
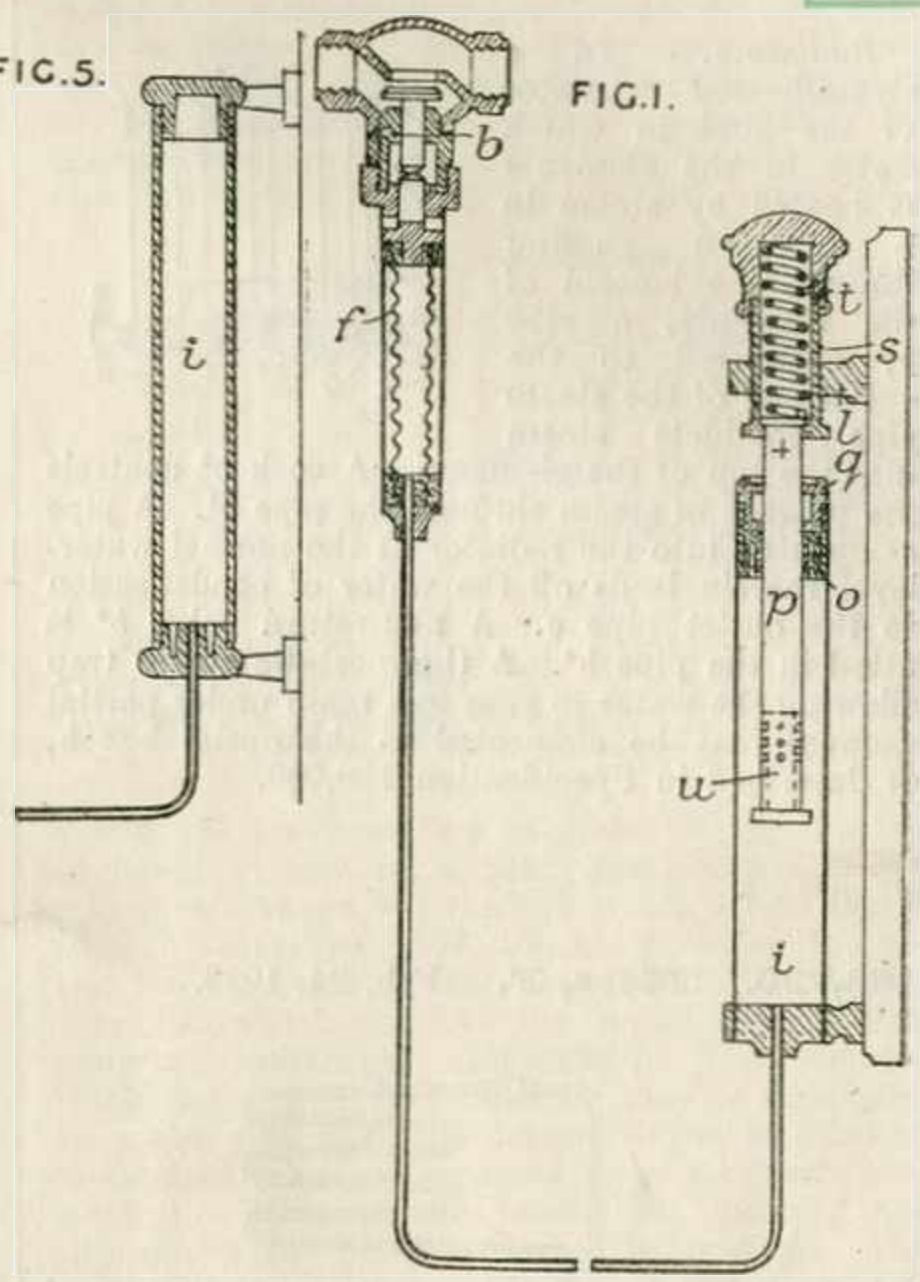


FIG. 1.

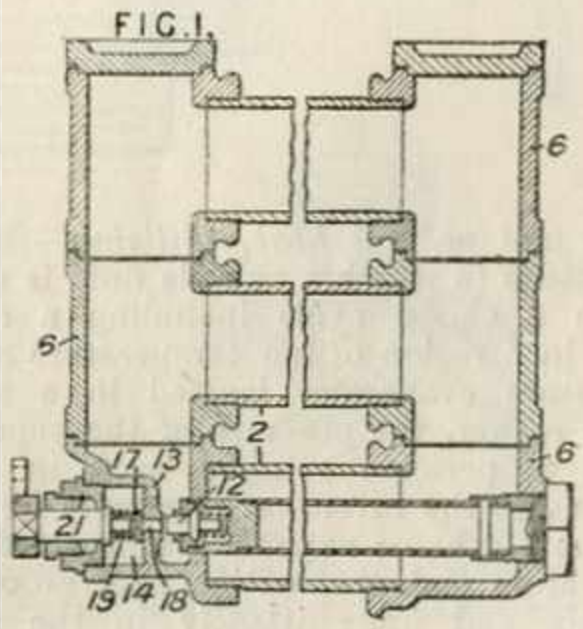


The spring is arranged either between the top of the piston and a screw-cap for tightening up the washer and adjusting the piston, or between a disc at the lower end of the piston and the lower disc for the washer. In a further modification Fig. 5, the piston 61, instead of being arranged in the reservoir *i* directly is arranged in a a cylinder 69 connected to tthe reservoir and replacing the membrane *f*, the piston being adapted to move so as first to actuate to the valve *b*, and then to compress a spring 71 to compensate for overheating.

163,613. Westinghouse Brake Co., Ltd., and **Barty, T.** July 5, 1920.

Radiators.—In a radiator for heating railway carriages, &c., steam is admitted to a compartment 14 formed by a partition 13 in a cap at the end of one of the elements and passes into the elements through an aperture 18 under the control of a thermally-operated valve 12, on one side of the partition, and of a hand-operated sliding valve 17 on the other side. The valve member of the sliding valve is mounted eccentrically on the valve spindle 21, and is pressed against its seating by a spring 19. The radiator consists of a number of tubes 2 secured to cylindical end caps 6 having their axes at right-angles to the axes of the tubes.

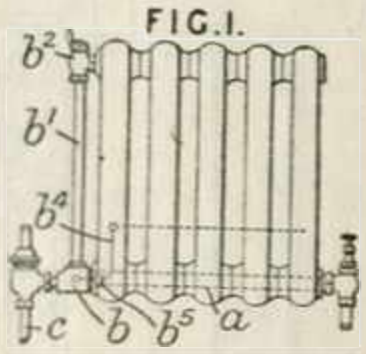
FIG. 1.



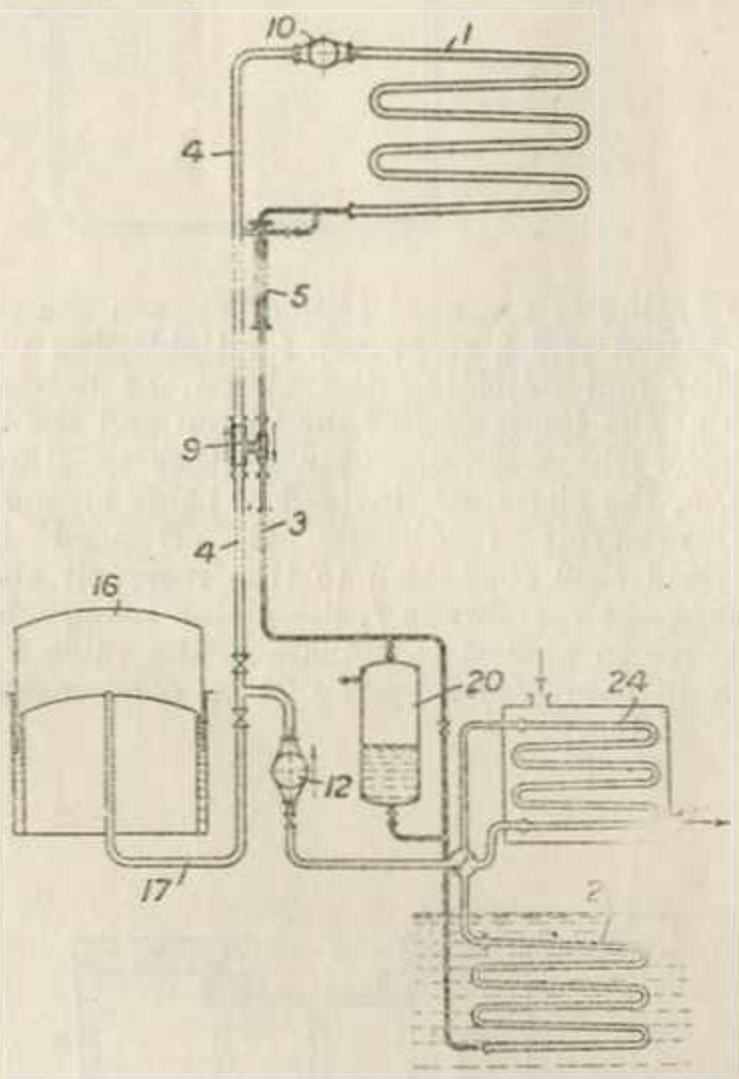
Codd, T. J., and **Johnson, H.** May 1, 1920.

Radiators. — In a steam-heated radiator of the kind in which water in the elements is heated by steam in a pipe *a* passing through the bottom of the elements, a pipe *b*, connected to the outlet end of the steam pipe conducts steam into the top of the elements. A cock b^2 controls the passage of steam through the pipe b^1. A pipe b^1 opening into the radiator at the normal water-level therein leads off the water of condensation to the outlet pipe *c*. A non-return valve b^5 is fitted in the pipe b^4. A thermostatic steam trap allowing the water to pass to a main under partial vacuum may be connected to the outlet box *b*, as described in Specification 158,009.

FIG. 1.



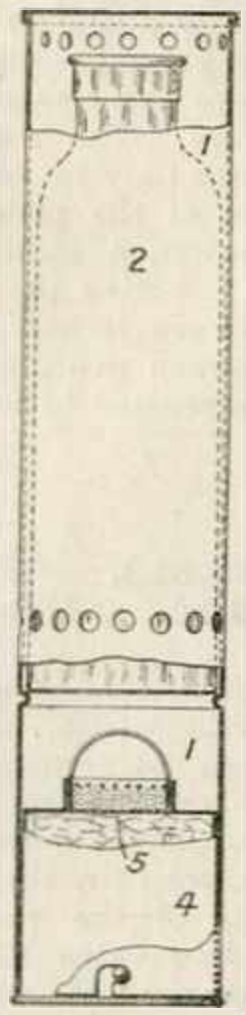
163,790. Merz, F. Feb. 24, 1920.



Solar and natural heat, utilizing.—Relates to installations in which a volatile fluid is circulated through a closed cycle including a condenser located in a region of low temperature and a low temperature evaparator located in a somewhat warmer region, the pressure of the vapour being utilized to perform external work in a motor. According to the invention reservoirs for the condensed and exhaust vapours are provided, so that condensation and evaporation may proceed independently and intermittently in the event of adverse local changes of temperature. A part of the power from the motor may be employed in driving a compressor for the vapours before they enter the condenser. The evaporator 2, which may be immersed in warm sea water or surrounded by air, is supplied with the liquefied vapour from the condenser 1 by a pipe 3. The vapour expands in a motor 12 and returns to the condenser through a pipe 4. The circulating fluid is maintained in a liquid state in the pipe 3 by evaporating a portion of it through a jacket 5, and the pressure of the liquid column may be utilized to drive rotary fans 9 in the return vapour pipe 4. A compressor 10 near the condensed 1 may be driven indirectly from the motor 12 or independently. The vapour may be heated by waste heat by passage through an interchange 24 on its way to the motor 12. The reservoir 16 for the exhaust vapour is connected by a valved pipe 17 with the pipe 4, and the liquid receiver 20 is connected to the pipe 3. The vapour reservoir 16 and the pipe 4 may be made of light impermeable tissue, and the condenser may be suspended from captive balloons at a considerable height. Suitable volatile fluids mentioned are carbonic acid; ammonia; sulphurous acid; methylchloride; sulphuric ether; carbon-bisulphide; and petrol.

163,918. Martin, J. Walter-. June 2, 1920.

Heating by chemical action. —A copper tube 1 adapted to receive a bottle 2 containing the liquid to be heated is provided at one or both ends with a burner 4 comprising a container filled with wick soaked in petrol, the vapours from which traverse a layer of platinated amianthus on a grid 5.



164,216. Kiell, J., and **Moon, W.,** (Representatives of *Hearson, C. E.*). May 4, 1920.

FIG. 1.

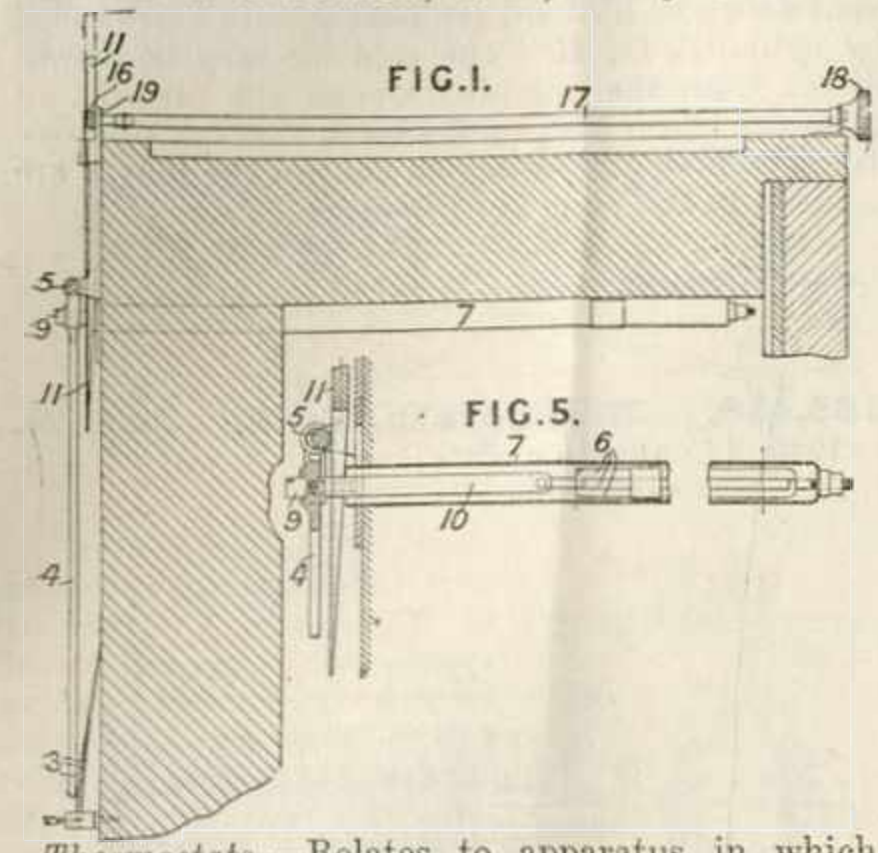
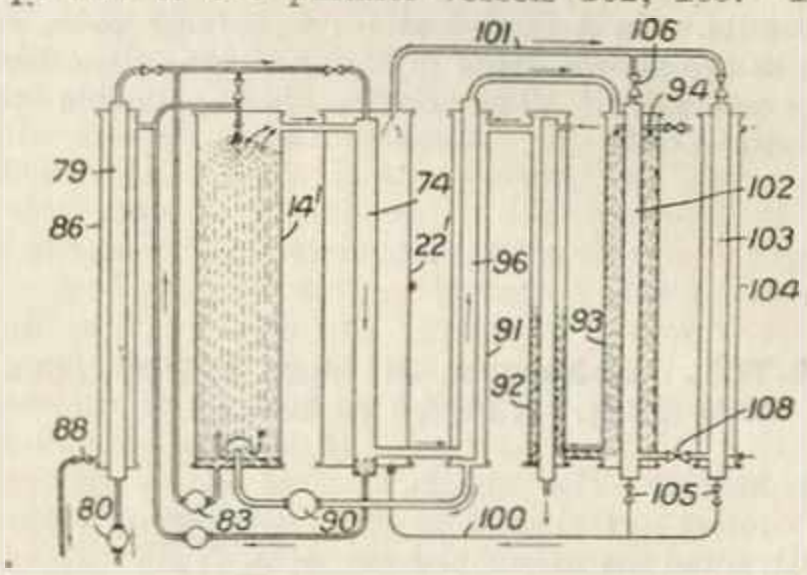


FIG. 5.

Thermostats.—Relates to apparatus in which the action of the thermostat is regulated by adjusting its position relatively to the transmission mechanism which controls the supply of heat, and consists in using a slidable member such as a wedge for the adjustment. The apparatus may be placed at the back of the oven, the temperature of which is to be controlled, in which case, the gear for sliding the adjuster is placed at the front and a scale is placed on the adjuster to face forward. The thermostat 6, 7 of nickel steel and brass is arranged horizontally in an oven, and the terminal piece 10 is coupled to a screw 9 in an arm 4 pivoted at 5. The abutment for the tube 7 is formed by the wedge member 11 which is adjusted by the rack and pinion 16 operated by the rod 17 and knurled knob 18. On the rod 11 is a temperature scale which faces the front of the oven, the reading being taken at the level 19. The arm 4 when moved by the thermostat co-operates with spring contacts 13 and cuts in or out one or more of the heating coils. The apparatus at the back of the oven is provided with a cover. Specifications 102,538, 121,097, and 128,316 are referred to.

164,595. Merz, F. May 6, 1920. *Addition to* 152,753.

Heating by chemical action.—The apparatus is shown diagrammatically. The concentrated solution is supplied by a pump through a regenerator 79 to the vessel 14^1 in which it is sprayed through a gas, saturated with water vapour, supplied by a pump 90. The gas heated by the dilution process and the condensation of the water vapour, passes by a duct 74 through a vessel 22^1 containing an easily-vapourized liquid, and also a motor for utilizing the vapour. From the duct 74 the gas passes through vessels 96, 93, in the latter of which it is again treated with water supplied by a pipe 94. From the vessel 93, the water-laden gas flows through a chamber 92 traversed by a pipe conveying a hot liquid, and through a vessel 91 surrounding the vessel 96 so that an exchange of heat takes place. From the vessel 91 the saturated gas is supplied to the vessel 22^1 by the pump 90. The exhaust vapour from the motor passes by a pipe 101 to the parallel vessels 102, 103. The



vessel 102 traverses the saturator 93 so that an exchange of heat takes place and the vessel 103 traverses a vessel 104 through which a cold liquid flows. Valves 105, 106, 108 are provided to control the flow through the vessels 102, 103, to the pipe 100 which conveys the liquid back to the generator-containing vessel 22^1. The concentrated solution in the vessel 14^1 may be circulated by a pump 83 until the desired degree of dilution is reached when it is passed away for fresh concentration through the vessel 86, heating the solution in the duct 79 during its passage. The partly-diluted solution collecting in the duct 74 is returned by the pump 83 to the vessel 14^1 or when the valve 88 is open passes away through the vessel 86.

164,663. Trane, R. N. Oct. 9, 1920.

FIG. 1.

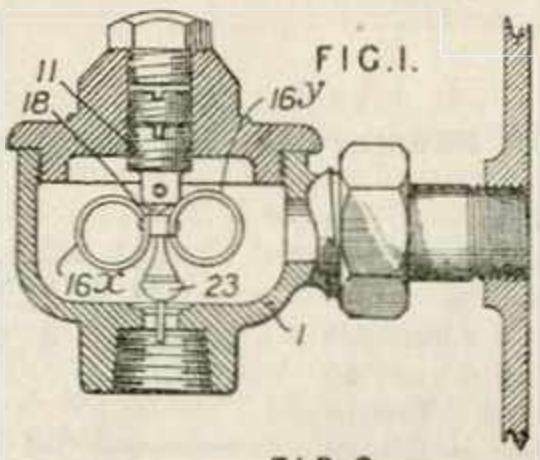
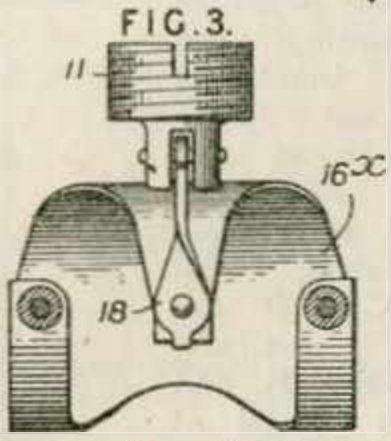


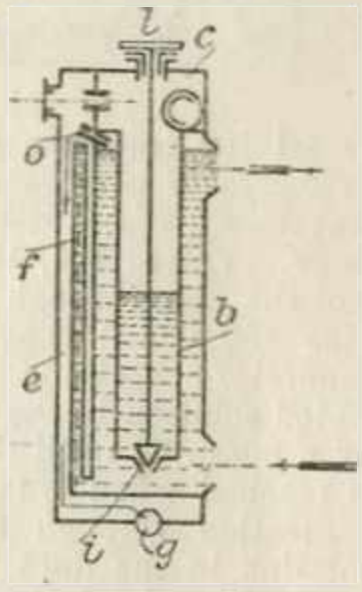
FIG. 3.



Steam traps; thermostats.—A steam-trap 1 is fitted with two Y-shaped bi-metallic blanks 16y,

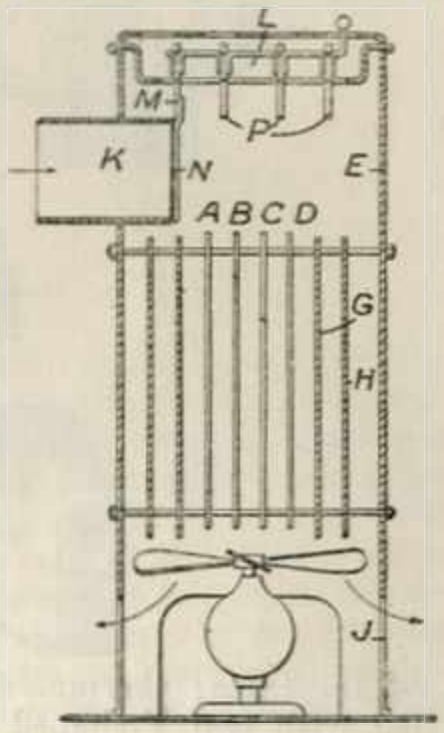
into circular form, the corresponding arms of the blanks being connected rigidly together and the lugs being connected respectively to a valve 23 and a support 18. Preferably the valve 23 has a spherical seat and the support 18 is pivotally suspended from an adjusting-screw 11, the opening in the top of the arms 18 being large enough to permit universal movement within limits. In a modification, two large pairs of blanks are shown fitted in series so that the effect is cumulative. The device is applicable to radiators.

164,701. Schwarz, J. June 5, 1920, [*Convention date*]. *Addition to* 147,063.



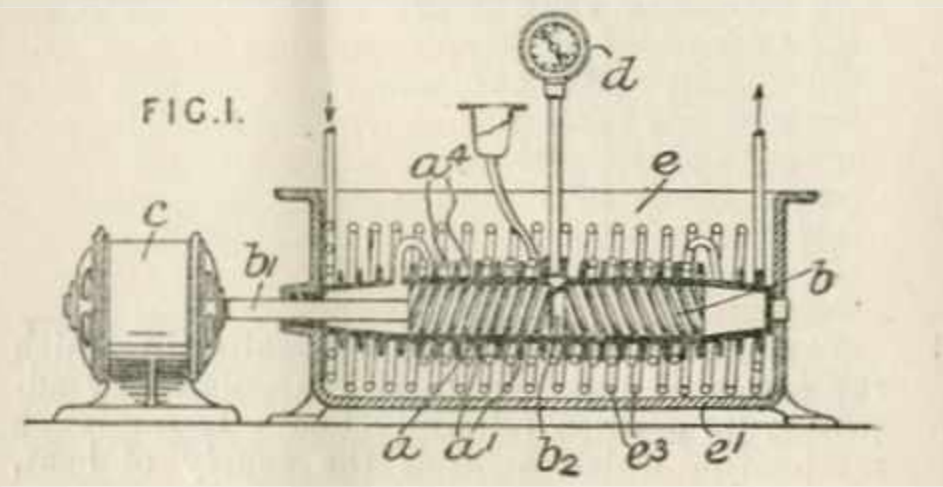
Radiators.—The heating effect of radiators constructed as described in the parent Specification is regulated by controlling the displacement of water from the steam heating unit itself. In the example shown the overflow pipe *f* is arranged in a chamber *e* from which the pipe *g* for the removal of condensate is branched, and the by-pass conduit *o* forms a direct communication between the steam admission chamber *c* and the chamber *e*. A valve *i* controlled by a handle *l* regulates the height of the water in the heating chamber *b* and hence to the area of heating surface exposed.

165,129. Mower, G. A. Oct. 12, 1920.



Radiators. — In heating and ventilating apparatus comprising hot elements enclosed in a casing and having means whereby air is drawn down through the casing, insulating means are interposed between the elements and the casing. Four electric heating elements A - - D are arranged vertically in the casing E, and a fan is placed at the bottom for drawing air downwardly through the casing and forcing the heated air through openings J at the floor level. To prevent direct radiation the elements are surrounded by cylinders G, H. The cold air may be drawn direct from the outside through the pipe K, or from the upper part of the room through a louvre L. The plates M, P which control the louvre are coupled to the plate N of the pipe K.

165,410. Noeggerath, J. E. June 23, 1920, [*Convention date*].

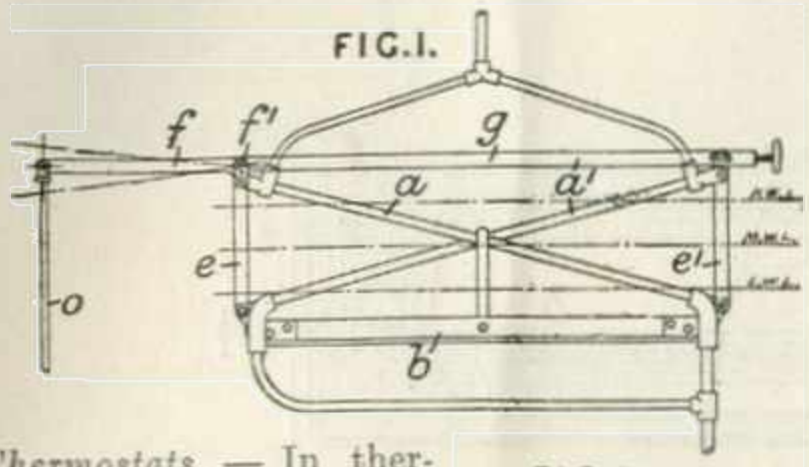


Thermostats.—Comprises methods and means for measuring various physical quantities by means of a viscous substance. The effect of viscosity set up between two surfaces in relative movement dependent on the quantity to be measured or regulated is employed for measuring or influencing the said quantity. The viscosity effect is manifested as a pressure. Several applications are described in the Specification by way of example. The first example is that of a viscosimeter, in which the viscosity is itself determined. A hollow cylindical casing *a*, having ribs a^1 encloses a rotatable cylindrical body *b*, on the surface of which are cut two fine helical grooves of opposite pitch. The shaft b^1 is rotated by the motor *c* and propels the viscous material towards the centre b^2 of the apparatus where the pressure produced is measured by a gauge *d*. Temperature coils e^3 are fitted and the inlet pipe a^4 is coiled around the casing *a* in the bath e^1. A shaft with fine helical grooves is a feature of all the examples described in which the viscosity effect is utilized to measure various physical quantities. Among the examples are revolution counters, weighing-machines, and governors for prime movers. The actuation or indication effected of these examples is brought about by variations in pressure of the viscous material utilized.

The Specification as open to inspection under Sect. 91 (3) (a) states that the viscosity effect is also manifested as a delivered or supplied volume, hydraulic energy or as a rise in temperature. In these connections apparatus for use as lubrication testers and thermostats were described. This subject-matter does not appear in the Specification as accepted.

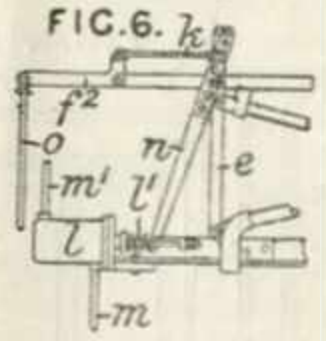
165,473. Woodroffe, F. K., Allen, K. M., Allen, D. M. L., Allen, V. M. B., and **Allen, T. W.,** (Representatives of *Allen, M.*). Dec. 20, 1919.

FIG. 1.



Thermostats. — In thermostatic apparatus for controlling the feed-supply to boilers &c., of the kind comprising oppositely inclined tubes in communication with the boiler and operating the feed-valve by the sum of the movements caused by the expansion and contraction of the tubes, the tubes are arranged to cross each other at the mean boiler water-level, and the upper ends of the tubes are connected together and to the feed valve. The movements of the inclined tubes a, a^1, Fig. 1, are communicated to the valve-rod o through pivoted links e, e^1 and a bell-crank lever f. A rod g between the upper ends of the links is adjustably connected to one of the links e^1, and is pivoted to the other by the pivot pin f^1 of the bell-crank lever. The tube a is secured to the short arm of the lever, and the tube a^1 to the upper end of the link e^1. The cross-bar b at the base of the tubes may be replaced by a tubular reservoir in communication with the boiler water space, the tubes opening into the ends of the reservoir. The reservoir may be formed with gills or with a cooling-jacket. In addition to the thermostatic control, the opening of the feed-valve may be controlled by the pressure of the feed-supply by means of a piston device l, Fig. 6, the feed pressure acting through a pipe m^1 on one side of the piston and the boiler pressure acting through a pipe m on the other side. The feed pressure is opposed by a spring l^1, and presses the piston-rod against the long arm of a lever n pivoted to the link e. A rod k adjustably connected to the short arm of the lever is pivoted to the short arm of a second bell-crank lever f^2 on the end of the bell-crank lever f. The valve-rod o is connected to the lever f^2. In a modification, the lever n is pivoted to the link e^1 and its short arm adjustably connected to the rod g. According to the Provisional Specification, the thermostatic tubes may operate the steam-valve of a feed-pump, or may be used for regulating the temperature of liquids or gases by admixture with other liquids or gases of different temperatures.

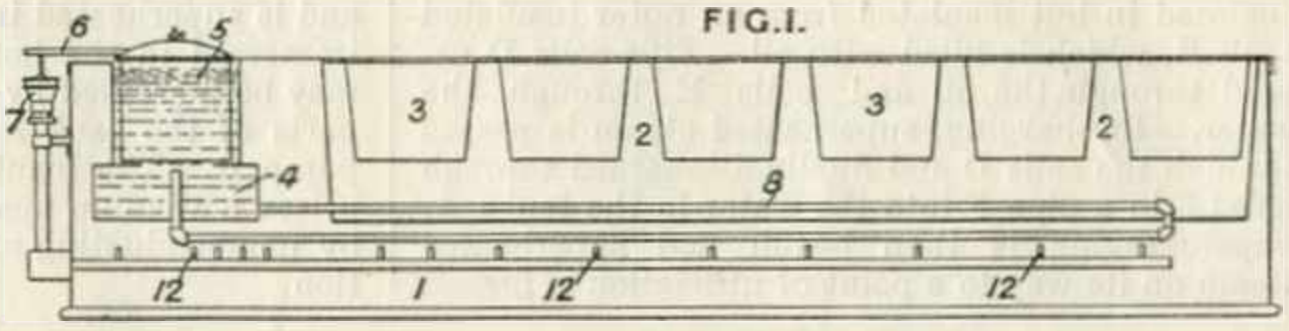
FIG. 6.



165,610. Stott, V. H., and **Schofield, L.** May 7, 1920.

Heating by circulation of fluids; thermostats. — In water heaters, ovens, hot closets, or other heating-apparatus wherein a float or inverted cup 5 is employed to regulate the supply of heating medium, a water circulating pipe or pipes 8 passes from the float chamber 4 into, through, or in contact with the tank, or oven, 2 to be heated and back to the float chamber, the heating medium being positioned under or in the tank, or the float chamber, or both, according to the temperature it is desired to maintain. Water may or may not be used in the tank according to whether a low or high temperature is desired. A gas-heated cabinet for glue-pots, suitable for a comparatively low temperature, comprises a chamber 1 containing the tank 2, with glue-pots 3, and the float chamber 4 containing the float 5 which operates the spring-controlled valve 7, controlling the gas, steam, or vapour supply, through the lever 6, to the burners grouped under the float chamber and spaced under the tank, or the burners under the tank may be omitted if a very low temperature is desired. The tank is heated by the circulating water assisted by the spaced burners. An arrangement for medium temperatures shows the burners arranged chiefly under the tank. In a modification, for comparatively high temperatures, the pipe 8 and all the burners are fitted under the tank. In a cabinet for liquefying metals, such as lead, the pipes 8 are fitted externally on the sides of the tank, out of influence of the burners.

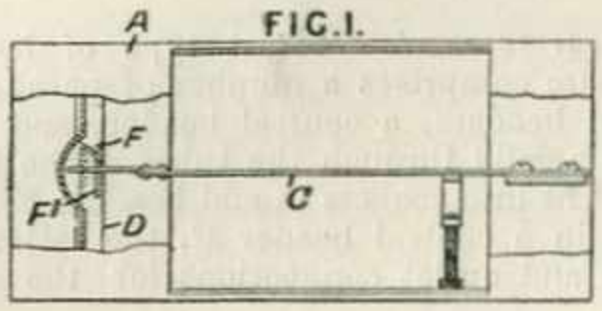
FIG. 1.



165,964. Pizzey, C. F. April 9, 1920.

Thermostats.—A thermostatic valve is placed in the pipe leading from the cylinder of an internal-combustion engine to the top of the radiator. It comprises a casing A containing a throttle valve, the transverse spindle D of which has cut in it two slots having a part F^1 parallel

FIG. 1.



with the axis and the part F helical. Pins on a bimetallic (invar-zinc for example) strip C engage the slots moving first along the straight portion until a certain temperature is reached and then along the helical slot to open the valve.

166,039. Schmidt, W. June 22, 1920.

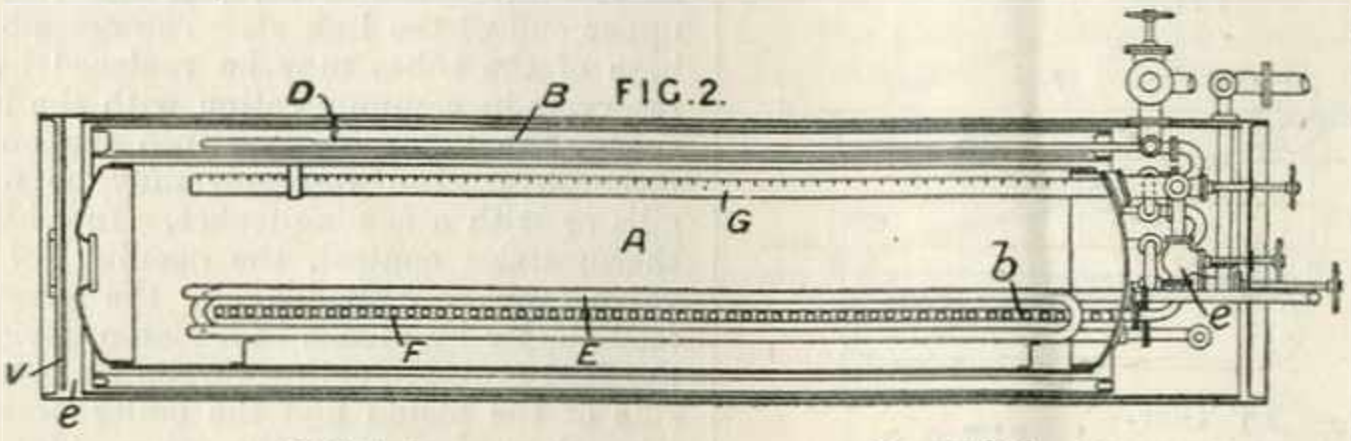


FIG. 2.

FIG. 1.

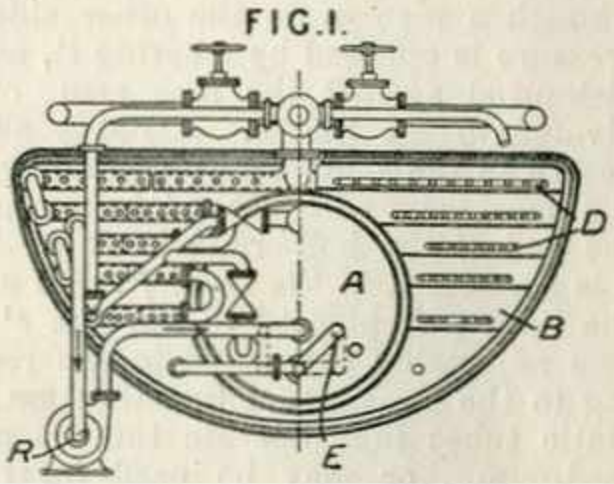
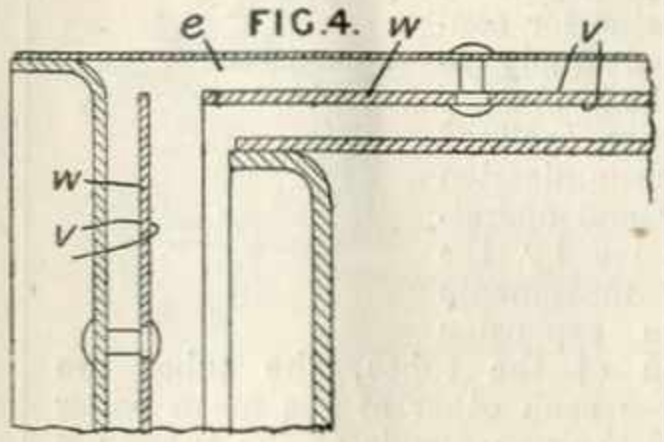


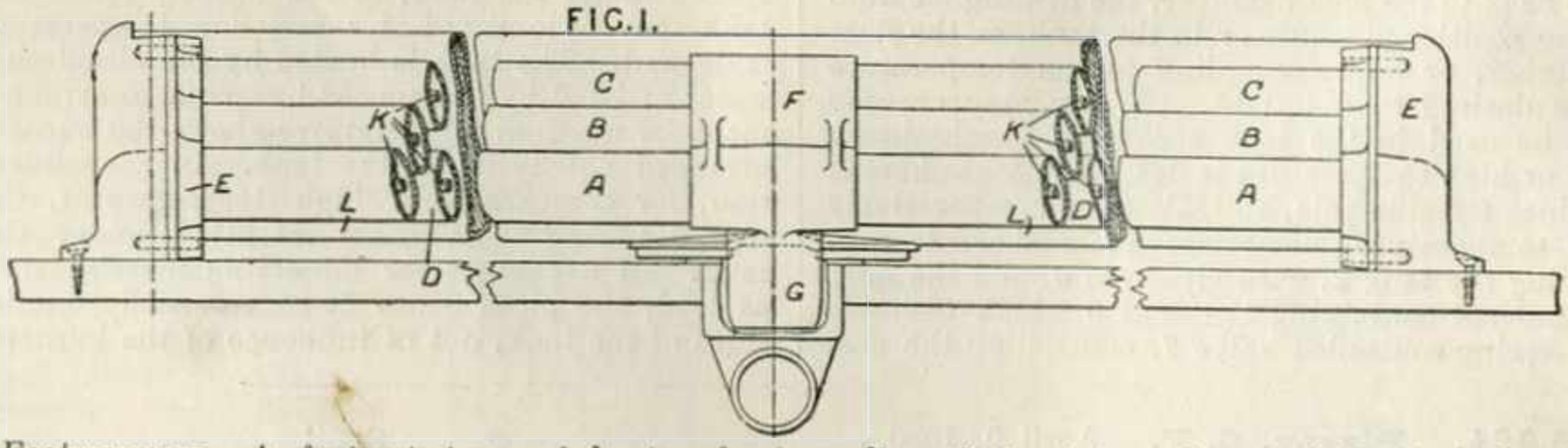
FIG. 4.



Heat-storing apparatus; non-conducting coverings for heat.—A steam accumulator having two working substances of different boiling points is provided with means for super-charging with heat the substance of the higher boiling point. In the example shown, a water-tank accumulator A is enclosed in but insulated from an outer insulated tank B, which is filled with oil. Pipe-coils D extend through the oil and coils E through the water. In charging, superheated steam is passed through the coils D and finally discharged through holes *b* in a pipe F into the water in the tanks A. Supercharging is then begun and superheated steam on its way to a point of utilization is passed through the upper coils D until the whole oil content is highly heated. Furnace gases may be used for this purpose or a part of the charging steam may be returned and re-circulated through the superheater. In discharging, steam passes from the inner tank A through the collecting pipe G and is superheated in traversing the upper coils D immersed in the hot oil. The output of steam may be increased by circulating oil from the lower parts of the tank B through the coils E by the pump R. The insulation of the outer tank comprises a vacuum space *e* with plates V separated by non-conducting material W to minimize radiation.

166,055. Arc & General Equipment, Ltd., and **Jones, A. Denman-.** Aug. 4, 1920.

FIG. 1.



Footwarmers.—A footrest type of heater for motor-cars comprises a number of parallel tubes, two end headers, a central header, and tie rods passing axially through the tubes. The tubes A, B, C, D fit into sockets in end headers E and into sockets in a central header F, the latter having inlet G and outlet connections for the heating-medium fitting into sockets in holes in a plate in the floorboards. The units are held together by tie-rods K and may be screwed to the floor. On removal from the car, the holes in the plate are covered by a disc. A back deflecting-plate L may be provided.

166,350. Fitzsimmons, J., and **Anderson, Ltd., T.** April 14, 1920.

FIG. 1.

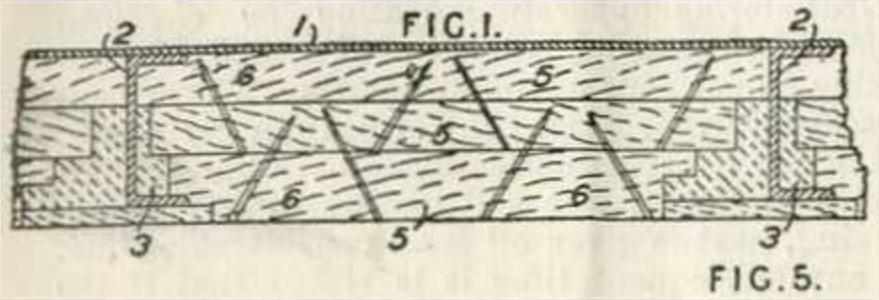
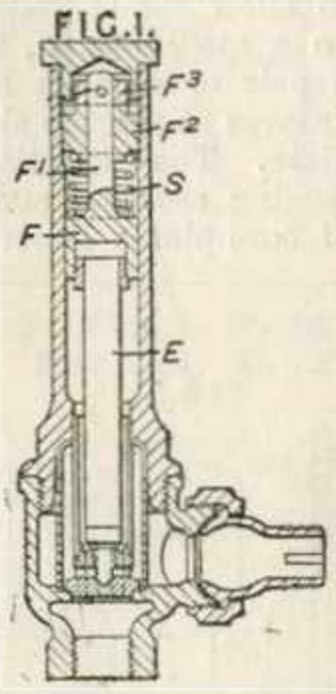


FIG. 5.

Non-conducting coverings for heat.—Cork slab insulation for cold-storage chambers in ships or otherwise are put on in layers and supported by stepped shouldered or inclined elements secured to the walls or to webs or stiffeners on the walls, and are held together by adhesives or pinned together. For a ship's bulkhead 1, Fig. 1, with a flanged beam 2, a stepped member 3 is attached to the beams and the cork layers 5 are slidden endways into position, securing-pins 6 being used. Instead of pins, a bent key may be used, the part 8, Fig. 5, being placed in one slab and used as an axis; the curved portion 10 is then driven up into the next overhanging slab. Where there are no beams, the stepped or shouldered surface is attached directly to the main surface.

166,480. Codd, T. J., and **Johnson, H.** May 1, 1920.

FIG. 1.



Steam-traps.—Relates to traps for use in heating systems, of the kind in which the outlet valve is controlled by the expansion and contraction of a metal bar E, and consists in securing the bar to a sliding block or piston F which allows the bar to expand against the compression of a spring after the valve has closed. A spring S is interposed between the piston and an adjustable block F^2. A rod F^1 on the piston moves freely through the adjustable block, a collar F^3 fixed on the end of the rod seating on the top of the block.

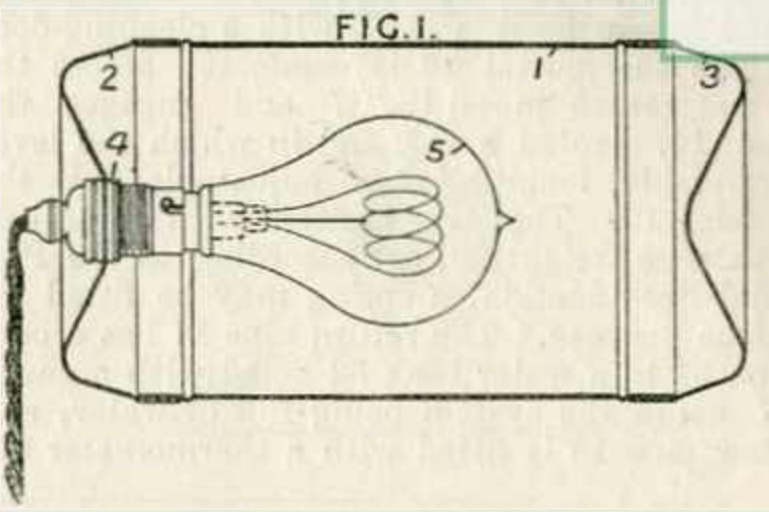
166,603. Lyon, D. Oct. 23, 1920.

Footwarmers and the like.—A bed-warmer or the like consists of a sheet-metal casing 1 having one or more detachable end-caps such as 2, 3 having inwardly recessed conical or domed surfaces, one of which provides a housing for the exterior part of a holder 4 for an electric lamp. The warmer may be enclosed in a fabric covering having drawing strings at each end and may be provided with a hook, ring, or chain by which it may be suspended beneath a garment.

(*For Figures see next column.*)

166,603.

FIG. 1.

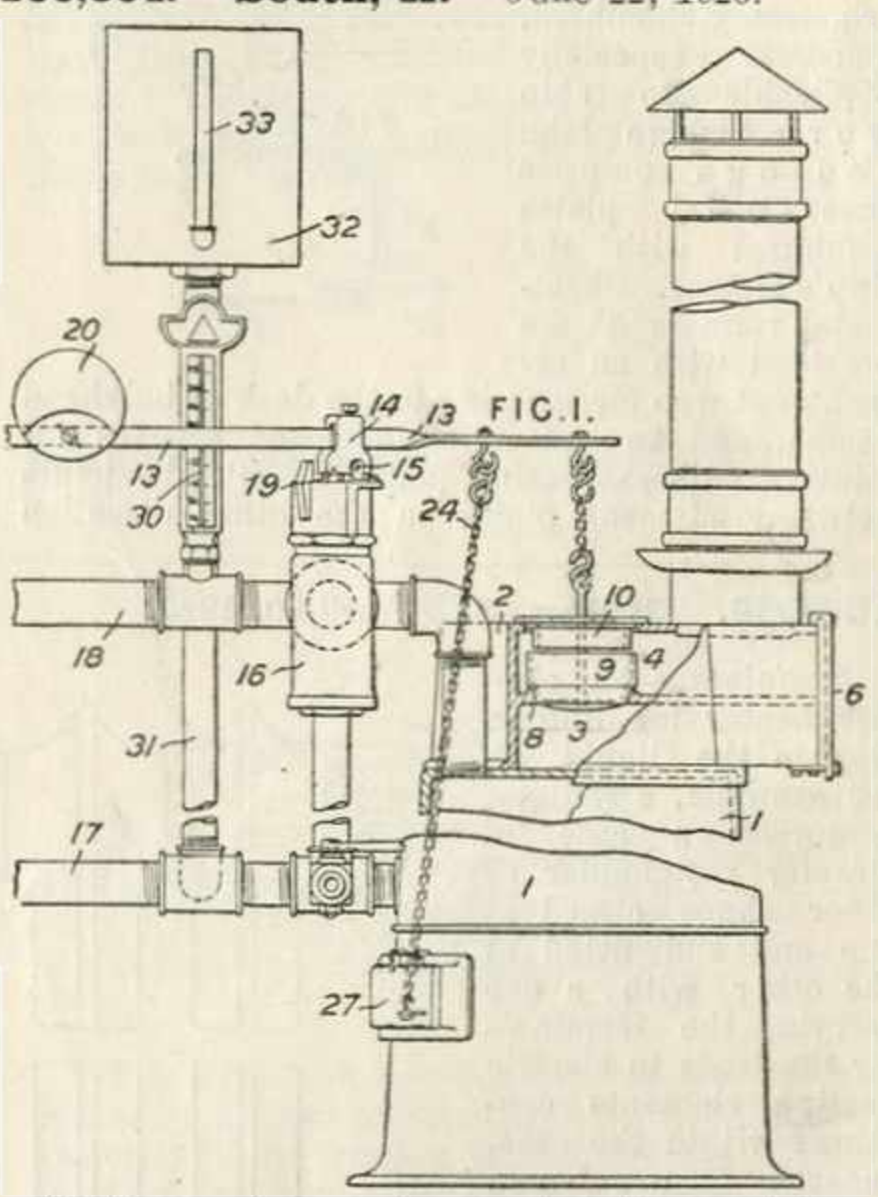


166,609. Quenby, A. G. H., and **Quenby, H. F.,** (*trading as* Quenby Bros.). April 6, 1920.

Heating by circulation of fluids.—The water in the radiators and cylinder jackets of internal-combustion engines and in other circulating systems is prevented from freezing by the addition to each gallon of 6 oz. of common salt, 4 oz. of sugar, and colouring matter. According to the Provisional Specification glycerine also is added.

166,804. South, H. June 22, 1920.

FIG. 1.



Heating systems and apparatus; thermostats.—The boiler 1 of a water-heating installation, which may be used in connection with incubators or brooder and rearing houses, is provided with a smoke hood 2 in two compartments 3, 4 fitted with a dish-shaped plunger damper 9 controlling an aperture 8 between the compartments and adapted to be raised or lowered around a depending air inlet ring 10, in the upper compartment, by means of a lever 13 operated by a thermostat. The lever also has a chain connection 24 to a

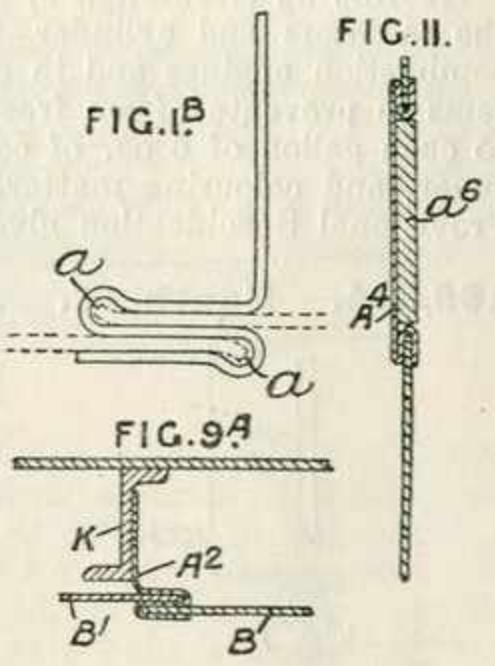
knight and front door 27 fitted to the boiler grate, and the smoke hood is fitted with a cleaning-door 6. The thermostat 16 is connected across the flow and return pipes 18, 17 and engages the bracket 14, pivoted at 15, and in which the lever is preferably longitudinally adjustable, by the knife-edge 19. The lever is fitted with an adjustable balance weight 20, or, according to the Provisional Specification, a spring may be fitted for the same purpose. The return pipe 17 has a connection 31 to a water tank 32 fitted with a gauge 33 to ensure the system being full of water, and the flow pipe 18 is fitted with a thermometer 30.

167,373. Bartlett, H. July 12, 1920.

Heat-storing apparatus; heating by chemical action.—A container is filled with a mixture comprising 80 per cent of sodium acetate, 10 per cent of sodium hypo, 5 per cent of sodium carbonate, and 5 per cent of lubricating oil. After immersion in boiling water and closing of the filling-opening, heat is given off for a considerable time. At any subsequent time it is stated that if the stopper is removed for 5 seconds and the device shaken vigorously, a further period of heating can be obtained.

167,517. Cammell, Laird, & Co., Ltd., Carter, Sir G. J., and **Berney, G.** Feb. 19, 1920.

Non-conducting coverings for heat.—Comprises means for securing in position and strengthening sheet-metal cover-plates such as insulating-casings for refrigerating-chambers, and is especially applicable to ship work where the casings comprise sheet-metal plates combined with the ship's frames. Sheet-metal runners A^2 are provided with an attachment web for securing to the deck or bulkhead beams, and two reversibly-disposed grooves for jointing adjacent casing plates B, B^1, the joints between adjacent plates in the other direction

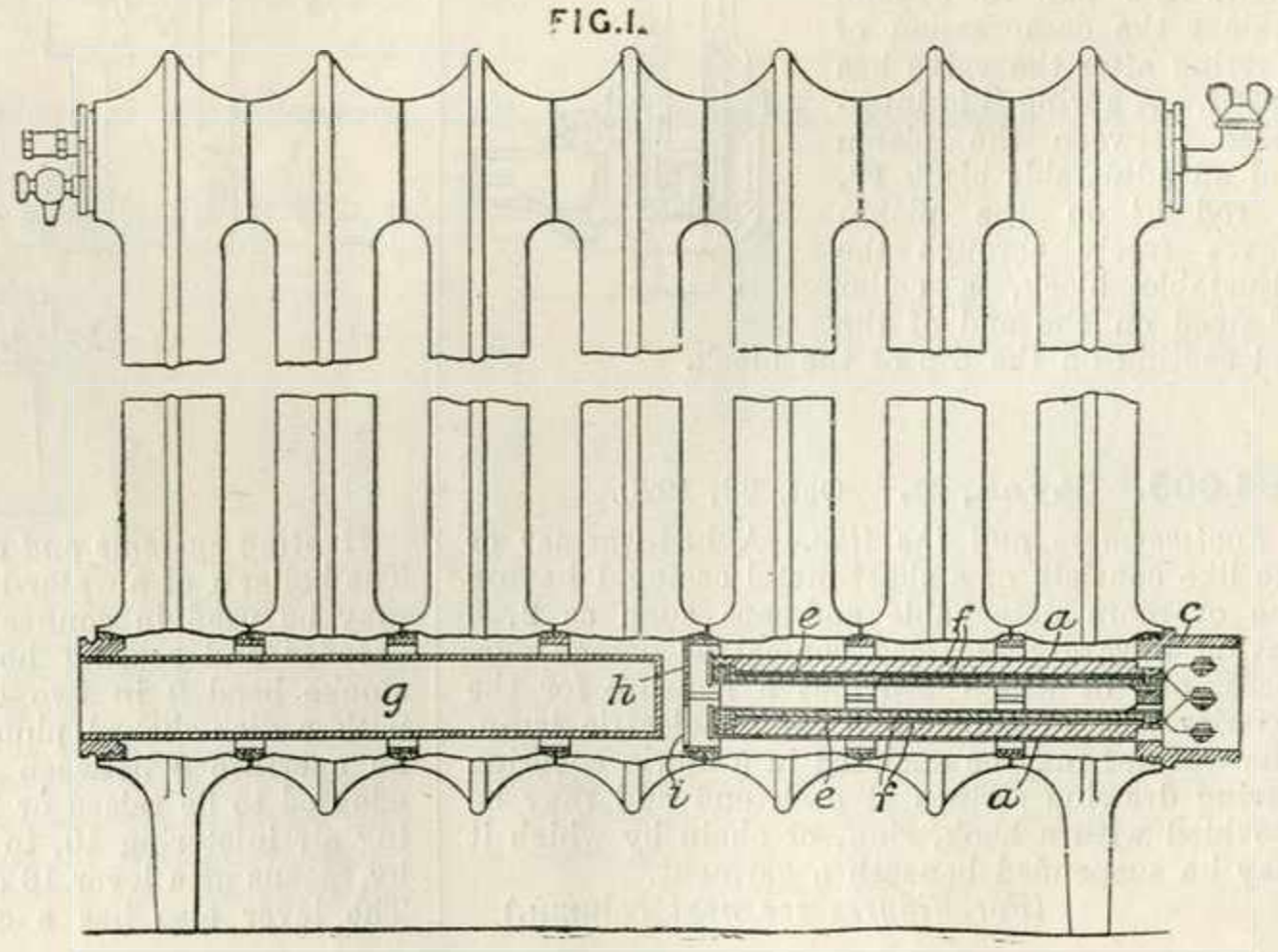


being made by similar runners with reversibly-disposed grooves, and preferably fitted with a stiffening-web. In a modification, alternate casing plates are secured directly to the beams, the plates in some cases being bent to form two reversible-disposed grooves to make the joint in one direction. In another modification, the runners and plates are twisted as shown at *a*, Fig. 1^B, so as to lock the plates. For jointing side and ceiling plates, a continuous runner is bent in the plane of its web, which is secured to the deck and bulkhead beams. A further modification comprises runners such as those used as key plates, Fig. 11, the runners being formed with a pair of reversibly-disposed grooves at each side, the intermediate part being plane, or set to the desired angle when used to joint plates in different planes. The key plates A^4 are a sliding fit and fitted with stiffening pads a^6, their object being to allow the introduction of insulating material. In a modification, the key plate is formed with a pair of grooves at the bottom side only, the grooves at the top side being formed on the casing plate. The invention is stated to be applicable to lagging casings, and the jointing and supporting of core-plates generally.

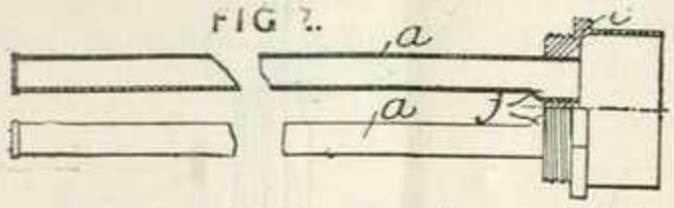
167,539. Nolan, J. April 30, 1920.

Radiators.—An electric heater for immersion in the liquid of, for example, a radiator comprises a case of circular rectangular or other shape closed at one end and fitted at the other with a cap carrying the terminals for the leads to electric heating elements contained within the case. In the form shown, the case consists of two D-shaped portions *a* facing each other and attached at one end to a bush *c* which screws into the radiator. Each heating element *c* comprises resistance wire wound round mica plates and protected on each side by mica

FIG.1.

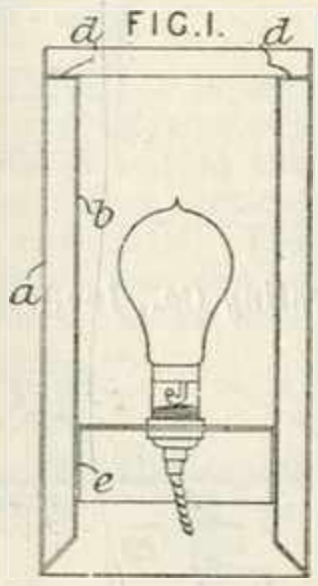


plates. These elements are clamped between metal plates *f*, one of which is curved to fit the **D**-shaped case. The ends of the elements



may be rebated so that a number may be connected together. The radiator may have a tube *g* fitted at the other end to diminish the quantity of water and so to permit the temperature to be raised more quickly. A nipple *h* with an opening *i* divides the lower part of the radiator into two chambers. The tubes *a* have tapered portions *j* so that as the heating elements are pushed in they are forced into good contact with the sides of the tubes.

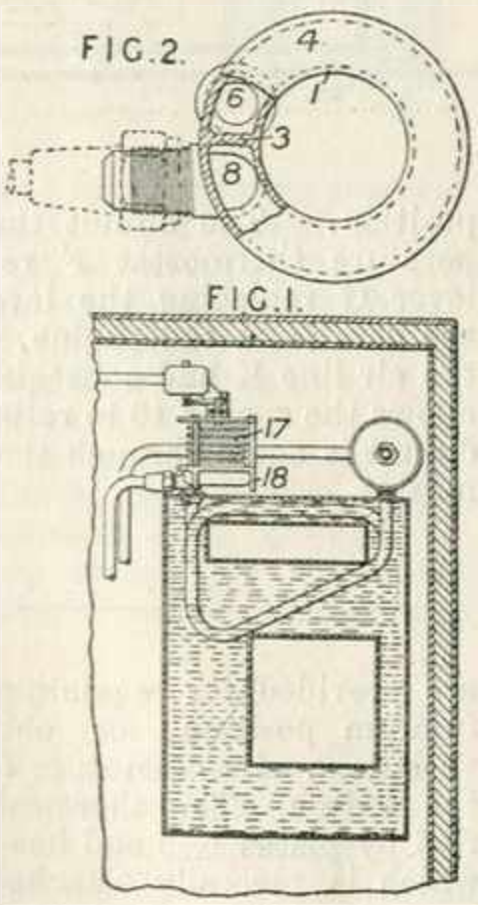
168,661. Edwards, L. A. June 4, 1920.



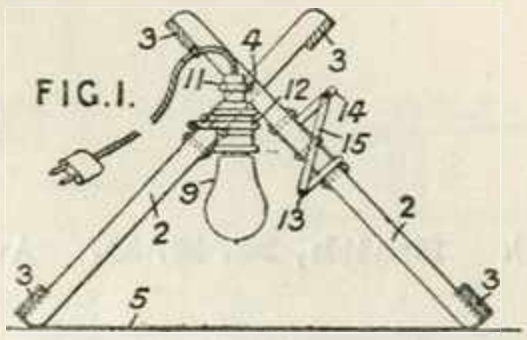
Footwarmers.—An electrically heated footwarmer comprises a cylindrical member having an air-jacket enclosed in double walls *a*, *b* and containing a lamp or other heating resistance mounted on a spring-fitting sliding sleeve *e* adapted to be adjusted within the member.

168,768. Heideman, F. J., Fowl, P. M., Krueger, H. R., and **French, C. E.** Aug. 16, 1920.

Thermostats. — Thermostats of the kind which rest on a portion of the circulating conduit are provided with means whereby the conduit and thermostat interengage. A hollow ring 1 forms part of the conduit and has an inlet 6 and outlet 8 on either side of a partition 3, Fig. 2. On the flat top 4 rests the thermostat 17, Fig. 1, which has projection 18 adapted to engage the edge thereof and prevent relative movement.

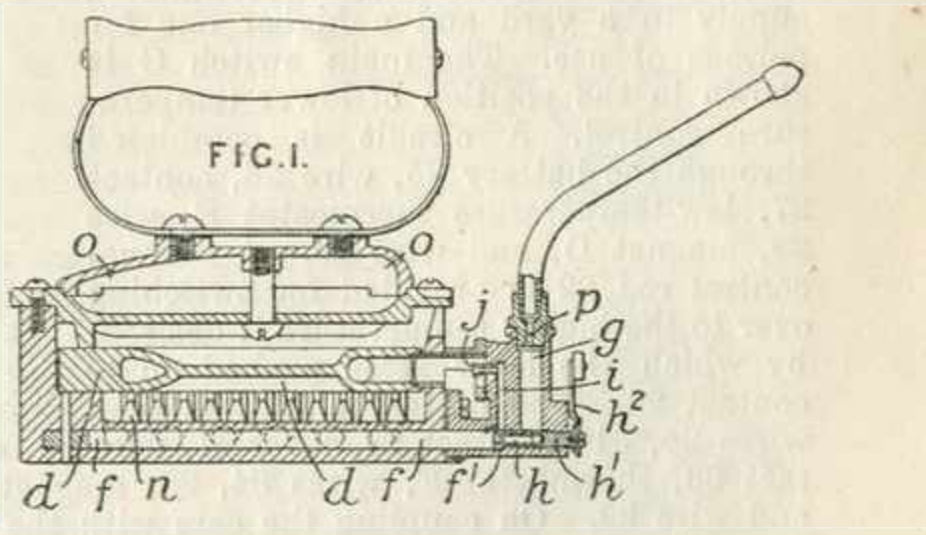


168,856. Guggenbühl, H. Sept. 7, 1920, [*Convention date*].



Bed-warmers. — An electrically-heated bed-warmer comprises a colapsable **X** or other shaped frame which may be formed by cross-pieces 2 connected by longitudinal members 3, an electrical source of heat such as a lamp 9 being supported in the cavity between the cross-pieces by bending the mid-portion 11 of the pivot 4 of the frame into a loop to carry a socket. A loop 12 passing round the lamp-holder and one of the cross-pieces assists in keeping the lamp in position. Flexible strips 5 maintain the frame in its open position. A projection 13 prevents the frame from being closed when the lamp is in its holder, and other obstructions 14, 15 prevent the lamp from being inserted when the frame is closed. The lamp circuit may be provided with a switch which is automatically closed on the frame being opened.

169,055. Ireland, J. July 13, 1920.

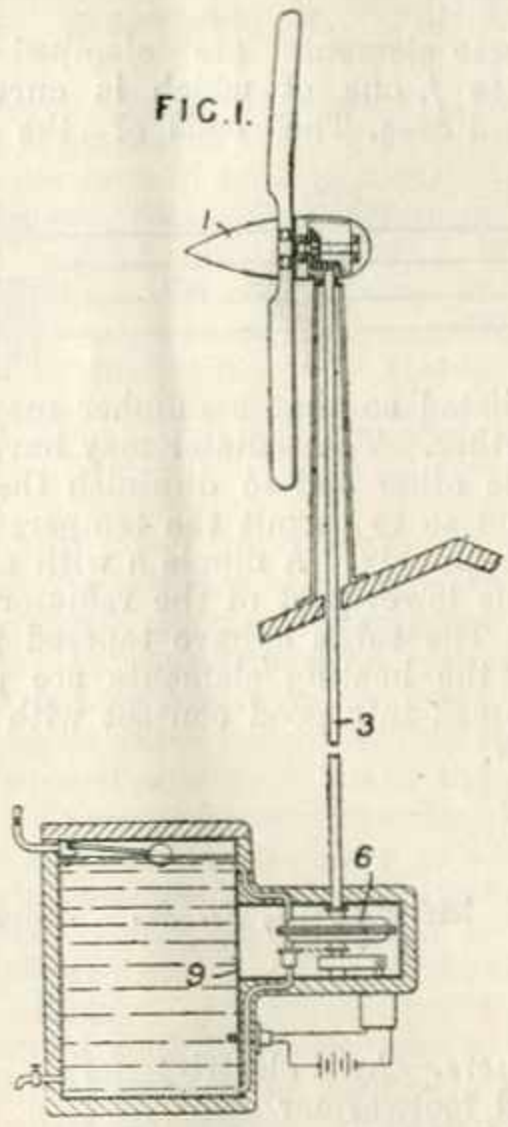


Thermostats.—A gas-heated flat iron is controlled by a thermostat comprising a metallic rod *f* enclosed in a housing in the base, and having one fixed end, the other free end f^1 being adapted to form a valve to throttle the gas inlet passage *h*. The valve seating and inlet passage are formed in a hollow screw h^1 provided externally with an adjustment handle h^2. The gas passes through a chamber *g*, past the valve f^1, through the vertical passage *i*, and jet *j*.

169,358. Smith, M. E. D. Aug. 3, 1920.

Heating systems.—A windmill 1 drives a friction device 6, the heat evolved being absorbed by water circulating from a tank 9. Thermostatic control may be used to regulate the speed of the shaft 3. The water may be used for heating buildings, ovens, &c.

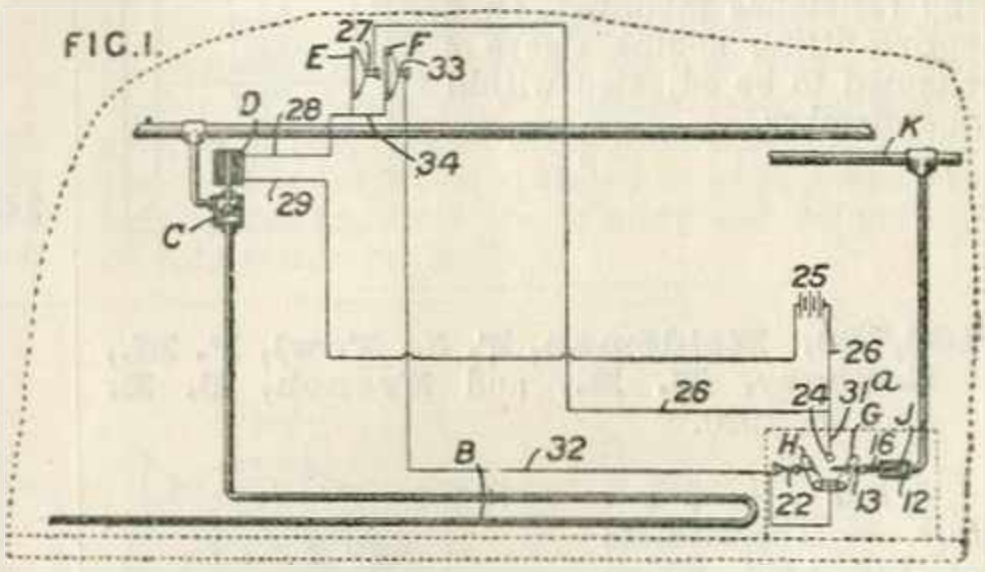
FIG. 1.



169,497. Brougham, F. J., (*Vapor Car Heating Co., Inc.*). June 22, 1920.

Heating vehicles.—In a steam-heating system for railway cars, the valve C on the supply-pipe to the radiators B is automatically controlled by two independent thermostats E, F set at two different temperatures, a lower one for when the cars are connected to a steam supply in a yard and a higher one for periods of use. The main switch G is shown in the position of lower temperature control. A circuit is completed through the battery 25, wire 26, contact 27, low-temperature thermostat E, wire 28, magnet D, and wire 29. A manual control rod 22 is provided for switching over to the higher temperature if desired, by which the lever H is pushed on to contact 24. The battery circuit is then through wires 26, 31^a, contact 24, lever H, wire 32, contact 33, thermostat F, wires 34, 28, magnet D, and wire 29. On coupling the cars with the engine for use, the air signal line K is put under pressure and the piston 12 in the cylinder J is moved, causing the lever G to pass on to the contact 24. At the same time the rod 13 pushes the lever H off the contact 24 back to its normal position. The circuit through the higher temperature thermostat F remains the same, the lever G replacing the lever H. On uncoupling the cars from the engine, the fall in pressure in the air line K and consequently in the cylinder J allows the spring 16 to return the lever G, and the circuit is again through the low-temperature thermostat.

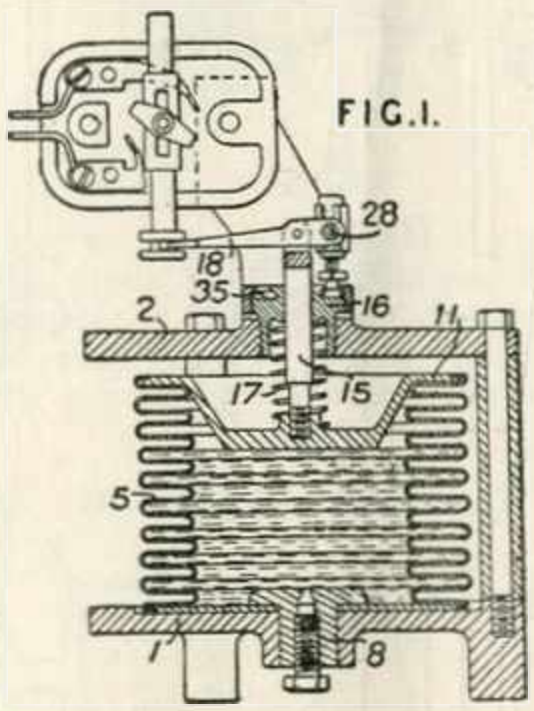
FIG. 1.



169,594. Heideman, F. J., Fowl, P. M., Krueger, H. R., and **French, C. E.** Aug. 16, 1920.

Thermostats.—In thermostats in which an electric switch is actuated by a lever controlled by a heat-responsive element and a spring, means are provided for regulating the spring and lever fulcrum position for obtaining predetermined variations of temperature for opening and closing the switch. The thermostat 5, Fig. 1, is carried by plates 1, 2 and has an operating rod 15 to which is pivotally attached the switch-operating lever 18. The container 5 is filled with a fluid

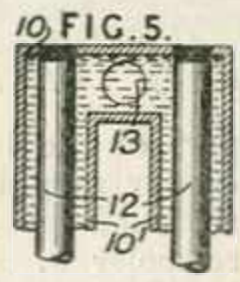
having a large coefficient of expansion such as sulphur dioxide, a filling-cap 8 being provided in the base. The upper part is closed by a dished plate 11 against which bears a spring 17, the compression of which is regulated by adjusting



the nut 16. The fulcrum of the lever 18 is carried by a rod 28 which rests in an annular groove 35 in the nut 16, so that on movement of the latter, the fulcrum has a corresponding vertical movement but is not displaced horizontal. The position of the fulcrum on the rod 28 can also be independently adjusted vertically by screw-and-nut gear.

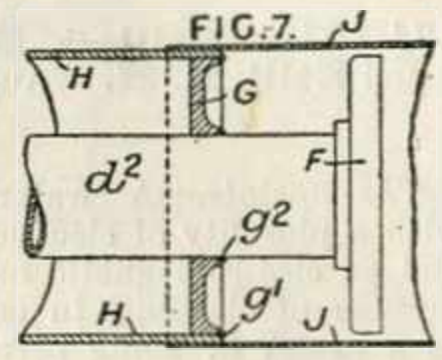
170,718. Bernard, P. J. H. Aug. 18, 1920.

Radiators.—A radiator comprises a plurality of cast standard sections consisting of rectangular base and head portions 10 joined by a pair of parallel columns 10^1 fitted with internal copper tubes 12 screwed into the casting, internally threaded bosses 13 being provided in the base and head portions for connecting-nipples. The columns 10^1 may be corrugated and the end sections cast with feet. A water-supply tank has connections to the base and head portions of one end section, and an end plug and air valve are fitted to the base and head portions respectively of the other end section. An electric heater is fitted to the base portion of the water intake section, the radiators comprises a single heating unit. The radiators may be used in connection with ordinary steam and hot water systems however, in which a number of radiators are installed.



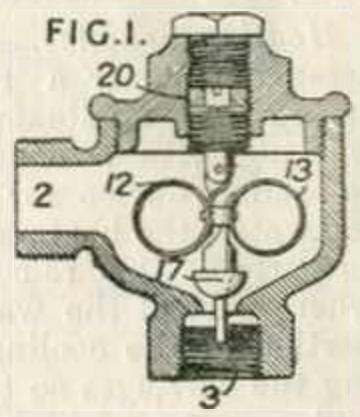
170,894. Cammell, Laird, & Co., Ltd., Carter, Sir G. J., and **McLay, W. J.** June 17, 1920.

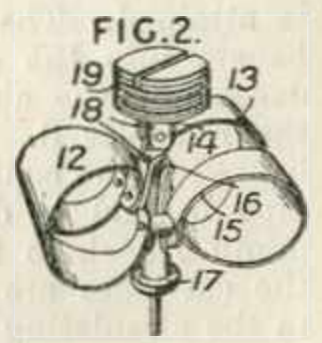
Non - conducting coverings for heat; heating by circulation of fluids. — Steam-pipes d^2 used for heating oil in tanks pass through the oil in the nearer tanks on the way to the more distant and are insulated up to the point of utilization as heating means. The insulating medium is enclosed in cylindrical casings H supported by flanges G of disc form as shown or of **C**-section to allow for expansion. The joints between the parts are made fluid tight, for example by welding at g^1, g^2. The flanges F are cased in by a cylindrical plate J, which need not be fluid tight.



170,983. British Thomson - Houston Co., Ltd., (*General Electric Co.*). Aug. 19, 1920.

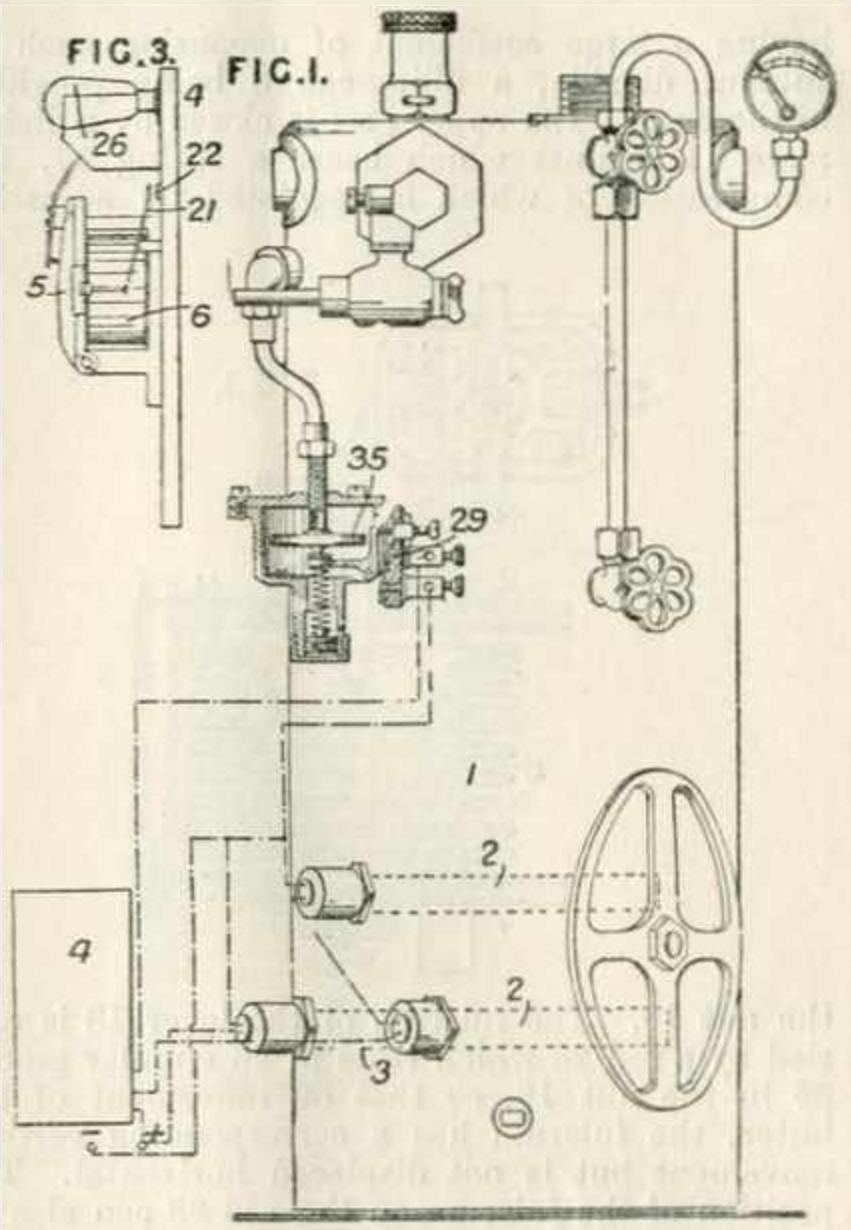
Thermostats.—A valve is operated by a thermostat comprising two curved metallic elements which are combined to give a straight-line motion to the valve. As applied to a steam heating system, the inlet passage 2 and outlet passage 3 are connected by a valve 17 controlled by thermostatic elements 12, 13. Each element has two prongs 14, 15 at one end a single prong 16 at the other end. The two prongs of each element are connected together, and the two free ends are connected, one to the valve and the other to the support 18. The resultant motion of the valve is rectilinear. The opening of the valve is adjusted by means of the supporting-screw 19, which is locked by the nut 20.





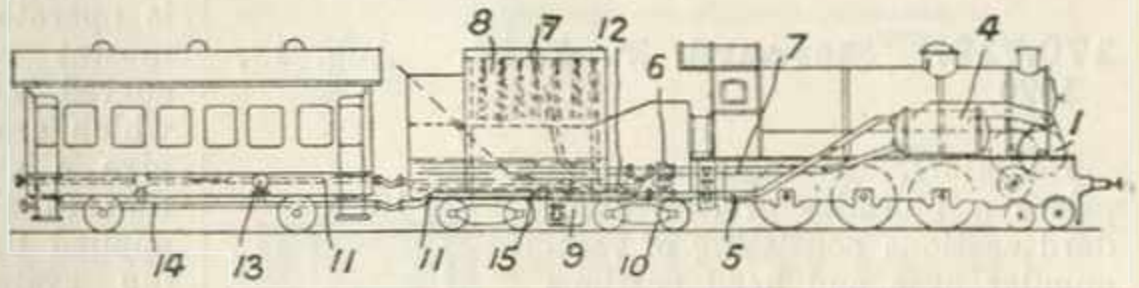
171,181. Still & Sons, Ltd., W. M., and Still, E. H. Aug. 11, 1920.

Thermostats.—A water-heater 1 is provided with a plurality of electric heating-elements 2, 2, and an electromagnetic main switch 4 varies the number of elements in use, at least one, shown as a heater 3, being permanently in circuit. A capsule 35 opens or closes a switch 29 in circuit with the main switch in accordance with the pressure within the vessel 1. The switch 4 has a pivoted member 5 attracted from the open position by means of a solenoid 6 when the capsule closes the switch 29, thus closing a circuit through the heaters 2. The switch 4 has a by-pass switch 21, 22 leading through lamps 26 to reduce the current flowing in the magnet 6 when the switch is closed.



171,377. Boltshauser, H. Nov. 12, 1920, [*Convention date*].

Heating vehicles.—In a heating arrangement for a railway train driven by a steam locomotive working with a condenser and a re-cooling device for the circulating water, the heaters are arranged as parts of the re-cooling device where part of the waste heat of a portion of the cooling water is utilized for heating the carriages so that a better re-cooling effect and consequent higher vacuum in the condenser is attained. The steam from the turbine 1 exhausts into the condenser 4 and is there condensed by the air-cooled circulating water from the re-cooler 8. The circulating water is delivered to the condenser 4 through a pump 10 and pipe 5, and is discharged through pipe 7 and pump 6 back to the re-cooler 8. Heaters 13, in the carriages are connected by pipes 11 and 14 to the circulating water circuit through valves 12 and 15 respectively and by adjusting these valves part of the hot circulating water from the condenser may be passed through the heaters and returned through valve 15 to the tank 9 in the re-cooler 8. The discharge water from the heaters may be led into the re-cooling device 8 for the purpose of being further cooled.



The Specification as open to inspection under Sect. 91 (3) (a) comprises also a reheater through which the cooling water may be passed before entering the train heating system. This subject-matter does not appear in the Specification as accepted.

171,402. Naamlooze Vennootschap Import & Exporthandel Globe, (Assignees of *Stiegelmeyer, J., and Sartorius-Werke Ges.*). Nov. 11, 1920, [*Convention date*].

Thermostats.—A device for regulating the flow of heating liquid in an incubator consists of a bell 14 depending into and rising out of a sealing-liquid which surrounds the upstanding outlet pipe 11. The bell 14 is attached to a lever 13 operated by a thermostat so that when the temperature in the incubator rises the bell is depressed to interrupt the flow. In a modification, a small slot 23 in the bell serves as a by-pass. Fig. 1 shows the device adapted to a number of incubator units, the arrangement comprising a water heater 4, pipes 5, 7, 8 and regulators 14 operated by the thermostats 12 controlling the

FIG.4.

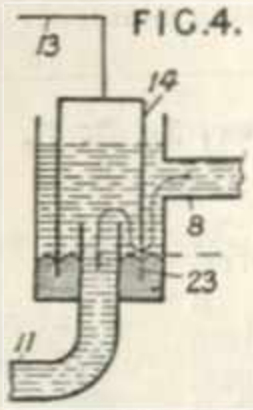
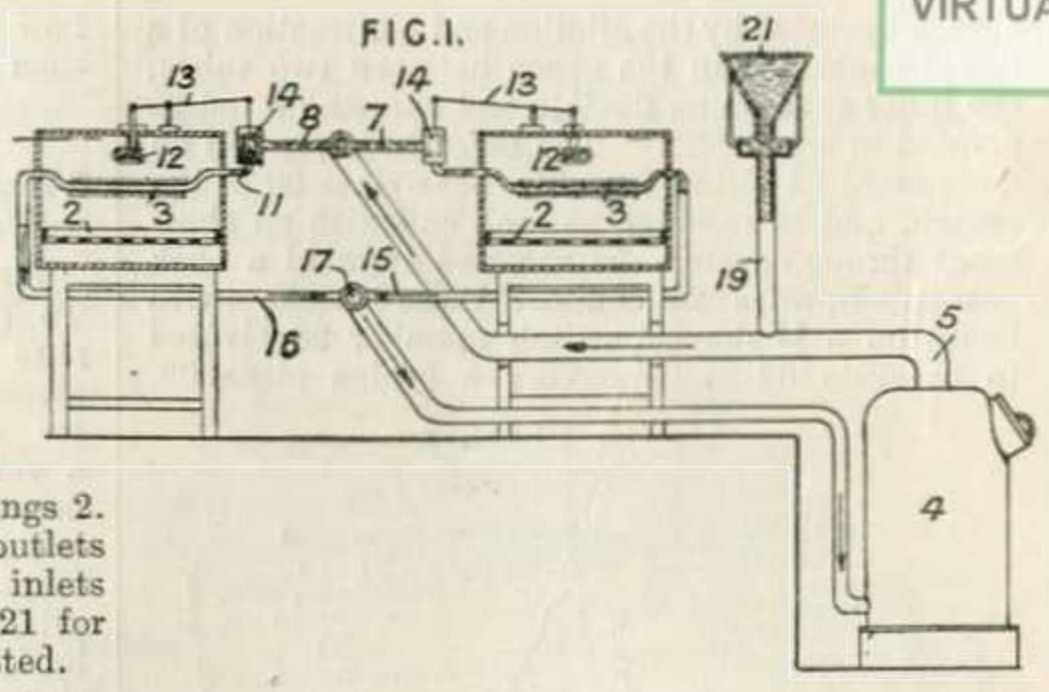


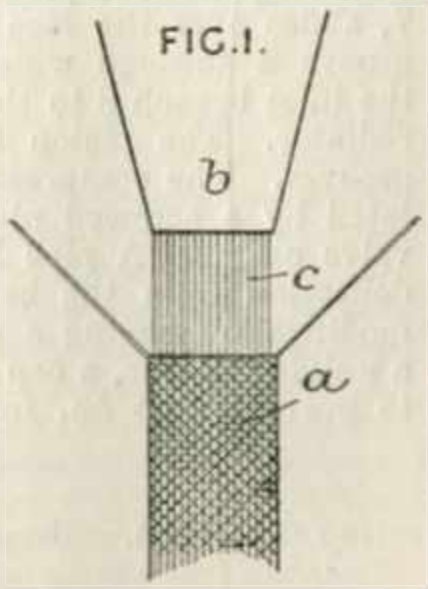
FIG.1.



flow of water to radiators 3 above egg-gratings 2. Return flow pipes 16, 17 are fitted, the outlets 15 being above the radiators but below the inlets 11. An overflow pipe 19 and a reservoir 21 for maintaining constant the water level are fitted.

171,428. Nadin, A. March 17, 1921.

FIG.1.



Non - conducting coverings for heat.—Relates to heat-insulating coverings for the pipes of refrigerating-machines and the like of the kind comprising a tubular sheath of fibrous material filled with granulated cork or similar material and adapted to be wrapped as a rope in one or more layers around the pipe. According to the invention, the sheath *a* is made in a braiding-machine and the granulated material is simultaneously delivered from a shoot *b*, being guided into the sheath by means of a ring of warp threads *c* which pass through the shoot into the rope and form an integral part of the finished rope.

171,998. Metropolitan - Vickers Electrical Co., Ltd., (Assignees of *Dann, W. N.*). Nov. 29, 1920, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Radiators.—A radiator intended particularly for use in cooling the oil or other cooling-liquid around electric transformers is built up of elements each consisting of two pressed metal plates having pressed-out end portions 7, the plates being welded together along their edges. The pressed-out ends on adjacent elements are welded together at their inner edges. Vertical ridges 9 in the plates divide the liquid spaces between the plates into a number of separate passages. The edges of the ridges in the two plates of an element are spot welded together. The elements are secured to the sides of the oil-tank by bolts passing through flange plates 18, 19.

(*For Figures see next column.*)

171,998.

FIG.2.

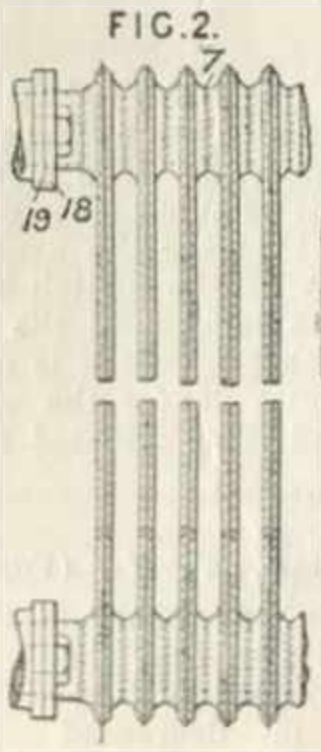
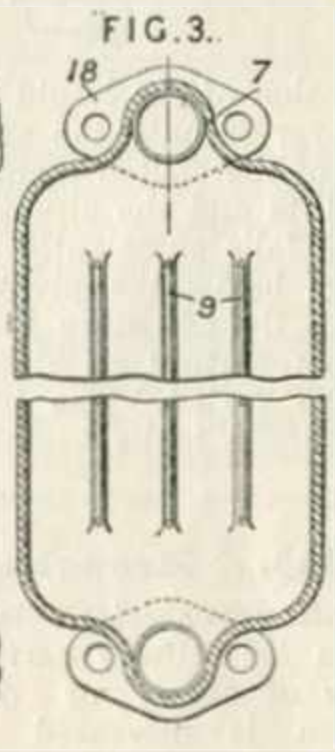
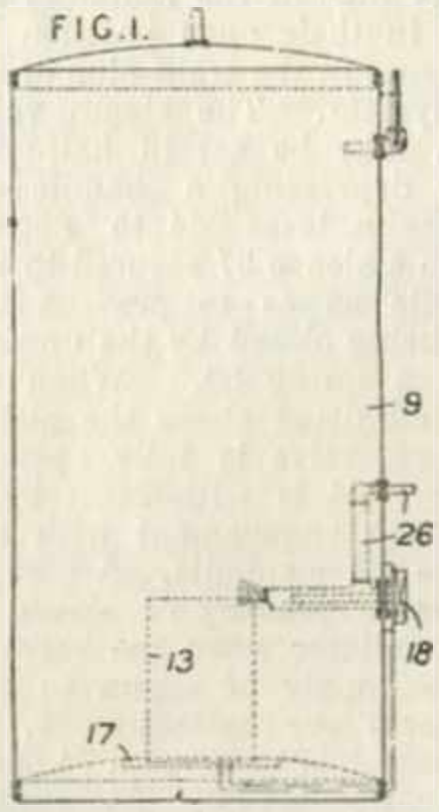


FIG.3.



172,036. Marks, E. C. R., (*Langguth & Haar*). May 21, 1920.

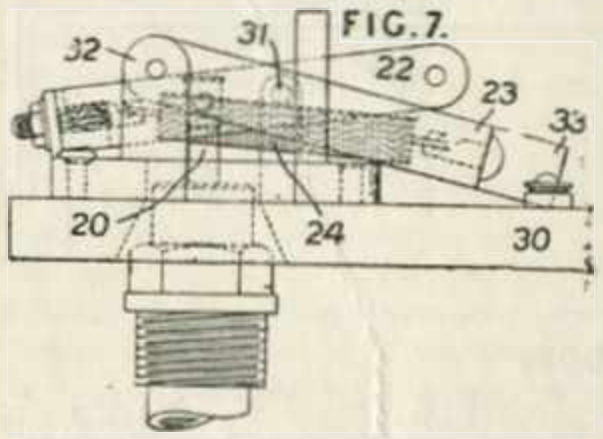
FIG.1.



Thermostats.—The current through the resistances of an electric liquid heater is controlled by a

switch operated by the dilation and contraction of a liquid contained in the space between two tubes, the inner tube being flexible and carrying a rod 20 pivoted to a lever 22. The lever 22 is pivoted on a standard 31 rising from the base-plate 30 of the switch, and is provided at each end with an abutment through which the screwed stem of a hook passes. Springs 24 connect these hooks with hooks on a **U**-shaped switch member 23 pivoted in brackets 32 and carrying a bridge piece 33.

FIG. 7.

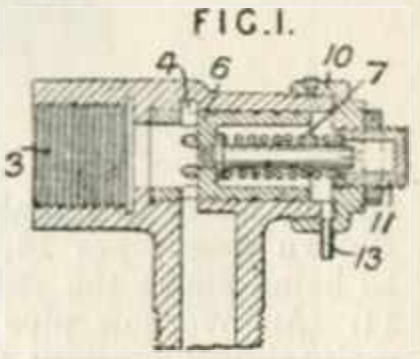


Expansion of the liquid raises the rod 20 moving the lever 22 until the axes of the spring pass the pivot of the switch member 23. The member 23 then lifts and the circuit remains open until the rod 20 falls sufficiently to bring the axes of the springs below the pivot of the switch member again. By adjusting the tension of the springs the temperature at which the switch is operated may be varied. The inlet 26 for the water or other liquid to be heated is so situated that the flow is directed first on to the thermostat and then on to the heating element.

172,335. Tolmer, L. J. C. Dec. 4, 1920, [*Convention date*].

Heating vehicles. — To equalize the pressure throughout a steam-heating system for railway carriages, a valve device is fitted between the steam main and each radiator, the device comprising a piston 6, having a sleeve extension with radial parts, which, when the pressure in the radiator rises above a certain limit, and forces the piston outwards against the pressure of a weight or spring 7, slides over the face of the circular admission groove 4 through which the steam passes from the inlet branch 3 to the branch connected to the radiator. The piston is formed with expansion grooves. The compression of the spring is regulated by a screwed plug 11 in a cap 10 on the valve casing. A pipe 13 leads off water of condensation from the back of the piston. In a modification having a piston pressed inwards by a weighted lever, a cap is soldered over the piston to prevent dust &c. from entering the device.

FIG. 1.



172,345. Brougham, F. J., (*Vapor Car Heating Co., Inc.*). June 12, 1920.

Heating vehicles.—In a heating system for railway carriages &c., the supply of steam or other heating-medium is increased or decreased according to whether the signalling or other apparatus, which is connected up when the carriages are assembled, is in or out of operation. Valves in the steam-supply pipe of the radiators are maintained in their open position by the air pressure in the train pipe of the signalling system. The steam valve 25, Fig. 2, may be set in half-open position by depressing a handle 42, which causes a lever 44 to engage with a lip on a sleeve 37 secured to the valve spindle so as to prevent the valve from being closed by the upward pressure of a spring 30. When air pressure is admitted above the piston 28, the steam valve is fully opened, and the lever 44 is withdrawn by a spring 49 from engagement with the sleeve on the valve spindle. A port 27 allows a small quantity of steam to pass to the radiator when the valve is closed. The supply of steam to the main and auxiliary radiators K, L, Fig. 3, is controlled by a valve 74 operated by a thermostat 80. The supply to the auxiliary radiator is further controlled by a four-way valve 84 operated by piston device 98 connected

FIG. 3.

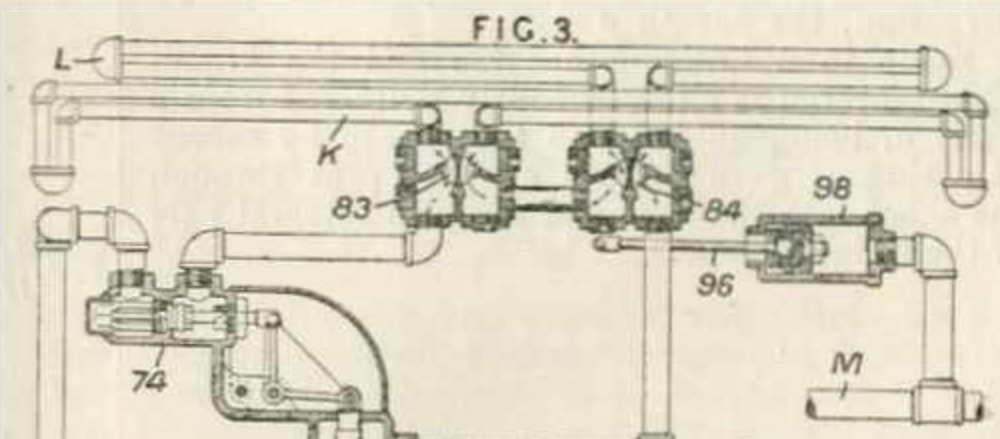


FIG. 2.

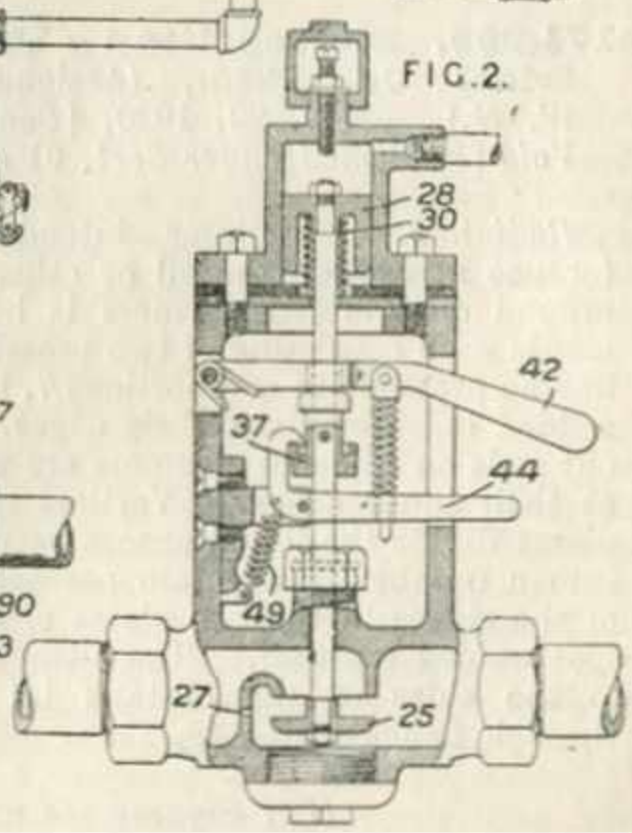
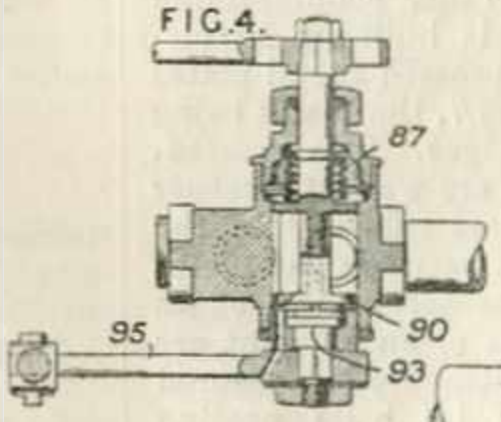


FIG. 4.

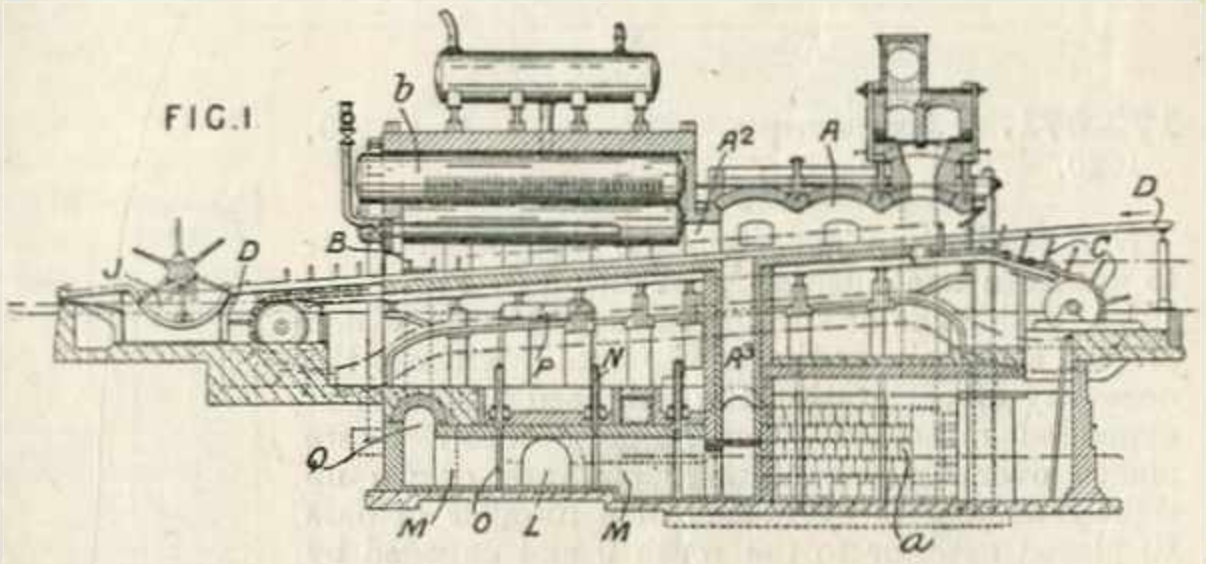


to the air-pipe M of the signalling system. A lever 95, Fig. 4, pivoted to the end of the piston-rod 96 rotates a member 93 having lugs adapted to engage in slots in a disc 90 on the end of the valve member. The valve may be operated by hand by raising it against the pressure of a spring 87 out of engagement with the lugs. The steam supply to the main radiator passes through a hand-operated valve 83.

172,381. Lavaud, D. S. de, Clark, B. F., and **Baines, C. W.** Aug. 31, 1920.

Heating systems and apparatus.—In means for utilizing waste heat given off by heat-treated articles during cooling, heat-utilizing means, such as a steam generator, is provided in the cooling chamber to which the articles are passed from a heating chamber. Means are also provided for passing the waste gases from the heating chamber during the period when articles are not being treated, directly into the cooling chamber wherein their heat is absorbed by the heat-utilizing means. In the apparatus shown, the heating chamber A communicates by means of a passage A^2 with the cooling chamber B in which is situated a steam generator *b*. The articles are passed through the chambers A and B on rails D by a conveyer C and are delivered to and through a quenching or coating bath J. Situated beneath the cooling chamber B is a passage M communicating with vertical shafts Q leading to the cooling chambers and with regenerators *a* beneath the heating chambers and connected therewith by vertical shafts A^3. Dampers N and O adapted to be raised and lowered alternately by a wheel P are provided in the passage M on each side of a tunnel L leading to a smoke stack. Normally the damper O is down and the damper N raised so that when articles are being treated, the hot gases from the heating chamber pass down the shafts A^3, through the regenerators *a* and away to the stack through the passage M. When articles are not being treated, the damper N is lowered and damper O raised so that the gases from the furnace pass through the cooling chamber wherein their heat is absorbed by the heat-utilizing means *b*, down the shaft Q and away to the stack through the passage M.

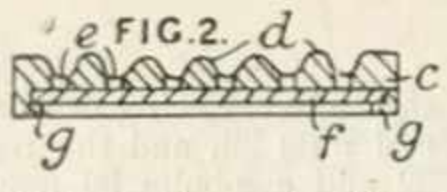
FIG. 1



172,571. Tocchio, M. April 14, 1921.

Heat-storing apparatus.—A cooking grill comprises a corrugated metal slab *c* which is preliminarily heated and is of sufficient mass to cook, by residual heat, the underside of a joint placed upon it. Elongated holes *e*, situated at the bottoms of the corrugations *d*, are arranged in transverse rows and are opened or closed by a sliding shutter *f* having slots corresponding with the holes *e*. The shutter slides in guides *g* and closes the holes *e* during the preliminary heating. The shutter and grill are provided with handles.

FIG. 2.



172,602. Marriott, C. W. Dec. 10, 1920, [*Convention date*].

Thermostats.—Electrically heated kettles and other appliances are provided with a depression in the base around the walls of which is placed an easily detachable electric heating unit which incorporates a thermostat such as a fusible plug control of the switch. The bottom 2 of a kettle,

FIG. 1.

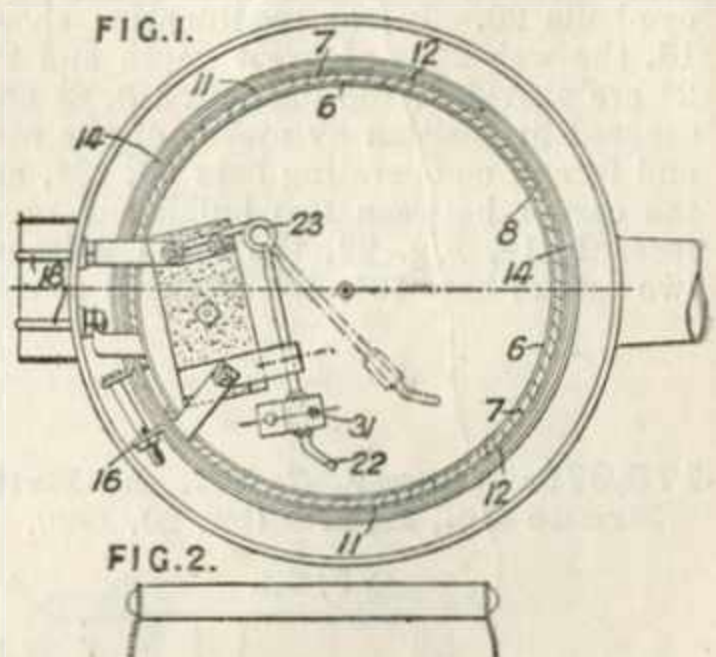


FIG. 2.

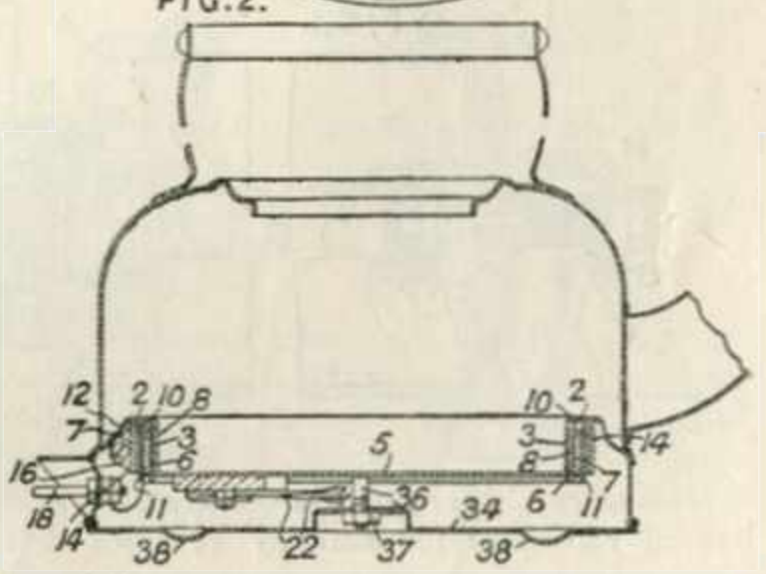
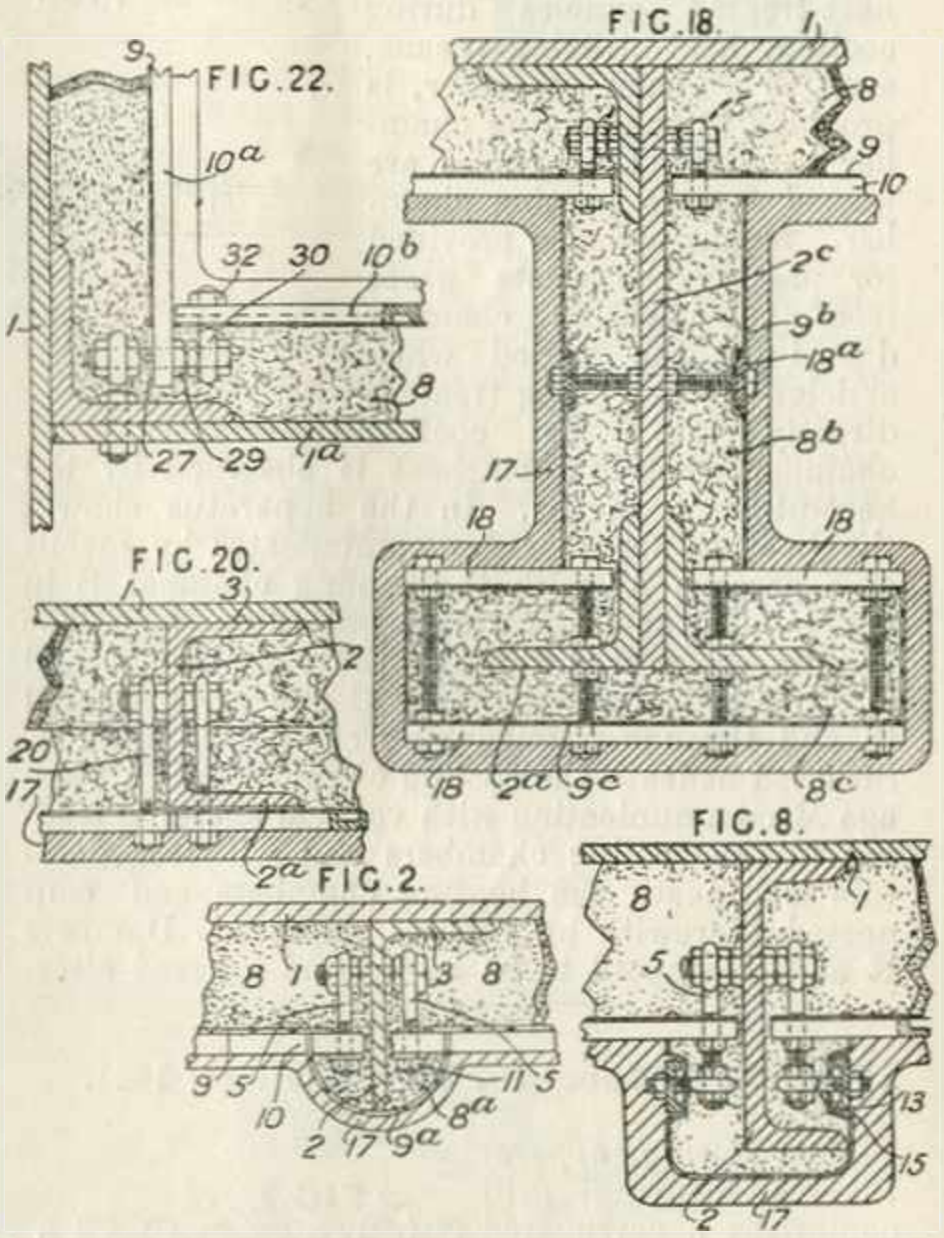


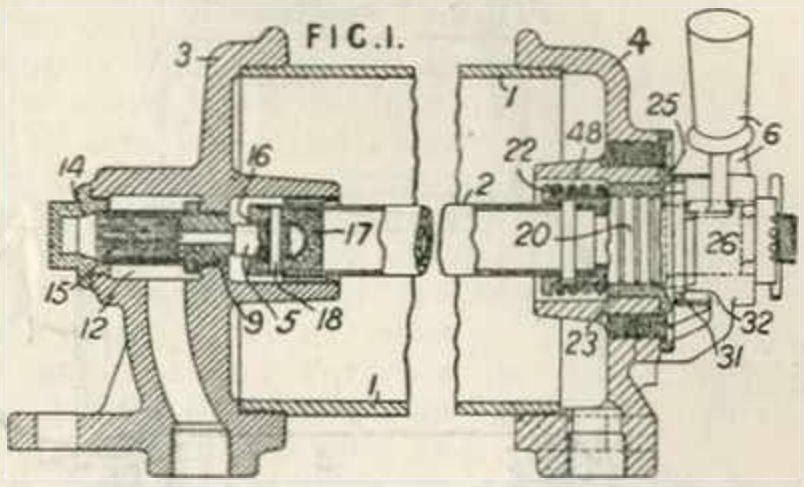
Fig. 2, has a depression 5, the wall 3 being surrounded by a resistance comprising an inner insulating rim 6, a heating element 8 on a mica core 7, a top insulating ring 10, an outer insulating rim 11, a copper rim 12, and finally a split rim 14 with clamping lugs 16. Of the two terminals 18, Fig. 1, one is connected with one end of the resistance wire 8, and the other to an arm of a switch 22. The lever is formed with a loop spring 23, or a separate spring may be used, and is normally held in the closed position by a pin 31 of fusible material. The outer end of the lever may project through the side of the vessel to indicate when the switch is in or out. A bottom cover 34 is held in place by the stud 36 and nut 37 and has depressions 38 forming feet.

172,871. Anderson, R. W. Dec. 29, 1920.

Non-conducting coverings for heat.—In order to secure a heat-insulating covering 8, Fig. 2, to ships' bulkheads or similar surfaces 1 from which project stiffeners or like abutments 3 without the necessity of perforating the bulkhead 1, sheets of expanded metal or other metallic mesh 9 are placed over the insulation 8 and are drawn up tightly against it by means of a number of bars 10 placed exterior to the mesh 9 and engaged by bolts 5 and nuts 11 or similar tightening-means carried by the stiffeners 3. In the construction shown in Fig. 2, the web 2 of the stiffener is of greater depth than the insulation 8 and a local insulation 8^a held in place by expanded metal 9^a laced to the mesh 9 is necessary to cover the projecting portion of the web 2. Such local insulation 8^a may also be held in place by lengthening the bolts 5, or, as shown in Fig. 8, by the use of auxiliary eye-bolts 13 mounted on the bolts 5 and co-operating with a second series of rods 15. When the web 2 is of less depth than the insulation 8, no local insulation 8^a is necessary, and, in some cases, where the stiffener 3 has a flange 2^a, it may be necessary to perforate this flange 2^a, as shown in Fig. 20, for the passage of the eye-bolts 20. In the modification shown in Fig. 18, the web 2^c is of great depth and two flanges 2^a are provided, the insulation 8, 8^b and 8^c being secured in position by means of the meshes 9, 9^b and 9^c and co-operating bars 10, 18^a, and 18. At the corner between two bulkheads or other surfaces 1, 1^a, Fig. 22, the mesh 9 is engaged by two sets of bars 10^a, 10^b arranged at right-angles, the rods 10^a being drawn up by means of bolts 27 and nuts 29, and the rods 10^b by means of nuts 32 and eye-bolts 30 mounted on the bolts 27.



173,370. Cross, J. W., and **British Air Brake Co., Ltd.** Oct. 20, 1920.



Radiators; thermostats.—Relates to steam-heated radiators for railway vehicles &c. of the type in which the admission of steam is thermostatically controlled by means of a valve 5 carried by an inner rod 2 having a higher coefficient of expansion than the outer casing 1, and in which the rod 2 is longitudinally adjustable so as to vary the temperature at which the valve closes. The valve seating-member 9 is mounted in the end-cap 3 of the radiator so as to be capable of removal therefrom without disconnecting the steam supply pipe from the heater or the end-cap 3 from the casing 1. With this object, the valve seating-member 9 is screwed into the end-cap 3 at the inner end of a chamber 12 through which the steam passes before entering the central passage in the member 9, and the outer end of the chamber 12 is closed by a removable plug 14 by which access is gained to the chamber 12

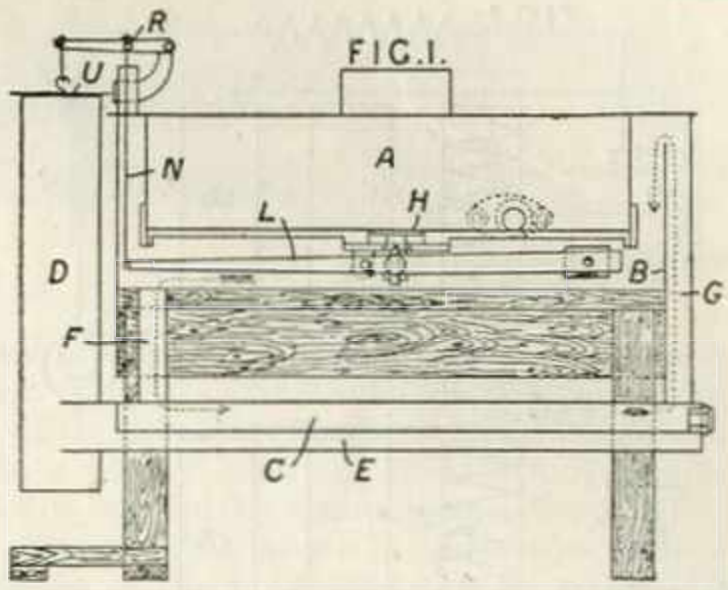
and member 9. A strainer 15 is arranged in the chamber 12 between the outer end of the member 9 and the plug 14. In order to ensure accurate seating of the valve closure-member 5 on the member 9, the closure-member is made of cylindrical form with a hemispherical end and is located in a recess 16 of slightly larger diameter than the member 5, the plug 17 in which the recess 16 is formed being secured to the expansion rod 2 by means of a pin 18 of slightly less diameter than the holes through which it passes in the rod 2 and plug 17. At the opposite end the rod 2 is connected to a sleeve 20, which passes through a cylindrical bush 23 in the end-cap 4 and is formed with a reduced portion 2 to receive a loosely-fitting operating-handle 6. The contacting surfaces of the bush 25 and the handle 6 are formed with cam surfaces 31, 32 respectively so that longitudinal movement is imparted to the rod 2 by rotating the handle 6. A spring 48 located between the bush 25 and a flange 22 on the sleeve 20 maintains the cam surfaces in contact.

173,417. Bacon, J. Dec. 9, 1920. *Drawings to Specification.*

Heating systems and apparatus.—A portable heater for use with fire-grates or gas, oil, or other stoves, consists of a flat boiler supported close in front of the grate &c. and connected by flexible flow and return pipes with an adjacent liquid container, which is in the form of a water-jacketed chamber adapted to contain a rack for plates &c.

173,672. Dawson, R. S., and **Letts, J. J.** Nov. 17, 1920.

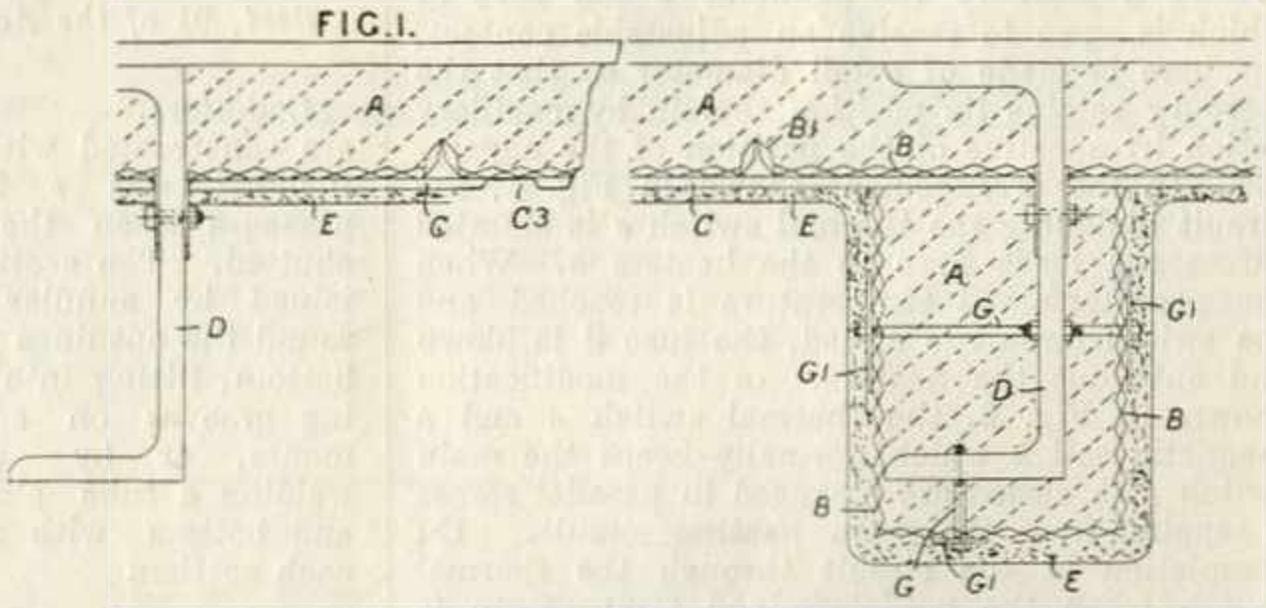
FIG. 1.



Thermostats.—In order to regulate the temperature of the contents of a vessel A which is heated by water contained in a surrounding tank B, the tank B is arranged in a circulating system comprising connecting-pipes F, G and a channel C in which the water is heated by means of hot air passing through an adjacent passage E, and the temperature of the circulating water is controlled by a capsule H located in the tank B and operating through the medium of levers L, R and a connecting-rod N a damper U situated over a flue D. According as the damper is open or closed more or less of the air, which is heated by a flame or an electric or other lamp, passes through the flue D, the remainder passing through the passage E to heat the circulating water.

173,682. Bean, A. Dec. 2, 1920.

FIG. 1.



Non-conducting coverings for heat.—Insulation A for boiler and engine casings, ships' bulkheads, decks, &c. is held in position by expanded metal B having indentations B1, the metal being pressed closely against the insulation by indented straps C secured at their ends to the stiffeners or beams D. The indentations C3 in the straps give a holding grip to the cement E with which the covering is finished. Bolts G having large washers G1 secure the insulation and expanded metal around the stiffeners or beams.

173,811. Hall, L. Aug. 11, 1920. *No Patent granted (Sealing fee not paid).*

Thermostats.—An alloy comprising 70—91 per cent of iron and 30—9 per cent of nickel, preferably 91 per cent of iron and 9 per cent of nickel, is melted in a clay or plumbago crucible or in an open hearth or electric or other furnace in which it does not come into contact with solid fuel, and the product is used in the construction of heat-regulators.

Lee, F. W. R., Lee, E. R., and **Golledge, V. F. H.** Oct. 20, 1920.

FIG. 1.

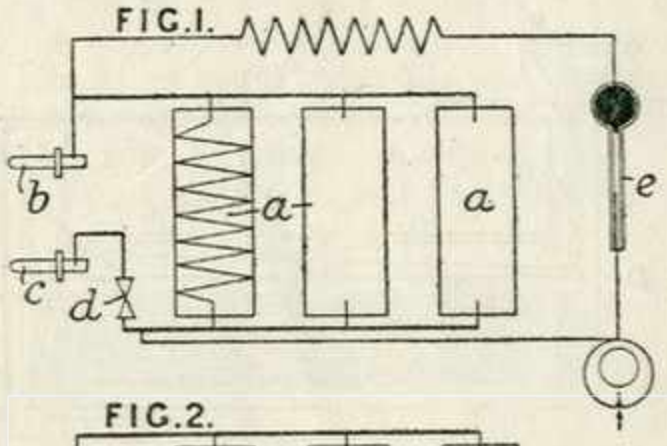


FIG. 2.

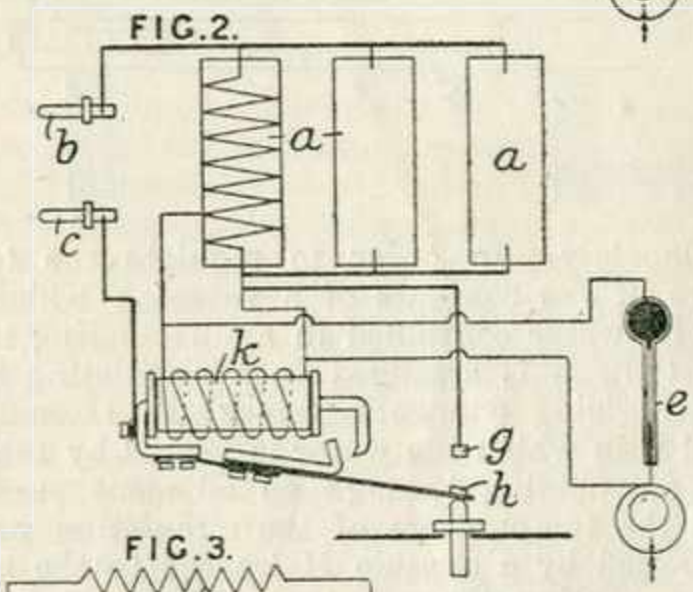
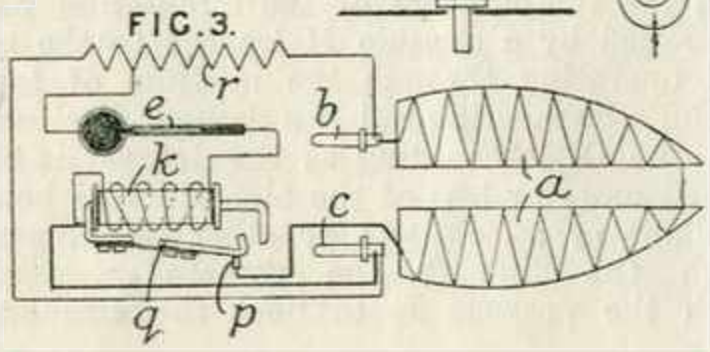


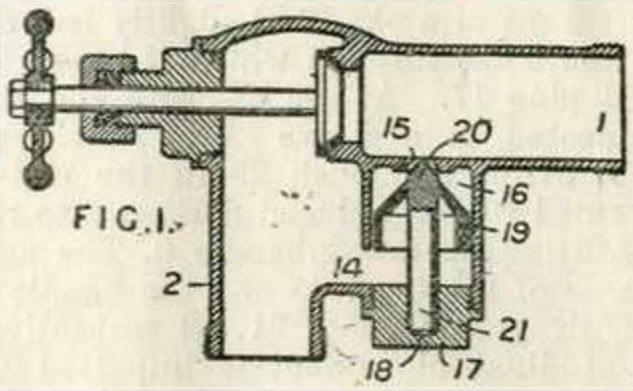
FIG. 3.



Thermostats.—In electric heating-apparatus, such as kettles, flat-irons, sterilizing-apparatus, &c., of the type in which the temperature is controlled by a thermostat or thermal switch comprising a mercury thermometer *e* the bore of which is open to receive an adjustable contact, the bore is made of small diameter so that the mercury retains its position therein by capillary action irrespective of the position of the apparatus. In the arrangement shown in Fig. 1, the circuit including the thermal switch *e* is shunted across the leads *b*, *c* to the heaters *a*. When the predetermined temperature is reached and the switch circuit is closed, the fuse *d* is blown and cuts out the heaters. In the modification shown in Fig. 2, the thermal switch *e* and a magnetic coil *k* which normally keeps the main switch *g*, *h* closed are arranged in parallel across a tapping from the main heating circuit. On completion of the circuit through the thermal switch when the predetermined temperature is reached, the magnetic coil *k* is short-circuited and the main switch *g*, *h* opened. In a further arrangement shown in Fig. 3, the main switch *p*, *q* for the heaters *a* is normally closed, but is opened when the magnetic coil *k* arranged in series with the thermal switch *e* is energized. The switch *e* and coils are supplied with current from a potentiometer *r* connected between the mains *b*, *c*. When the temperature falls and the thermal switch is again opened, the main switch *p*, *q* re-closes. Instead of a single contact extending into the bore of the thermometer, more than one contact may be employed, one of which is selected by a selective switch according to the temperature required.

174,449. Parker, J. F. Oct. 28, 1920.

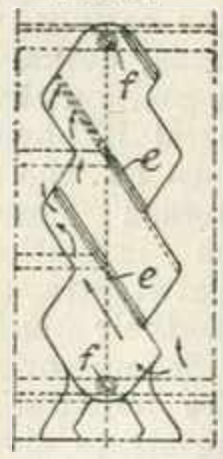
FIG. 1.



Steam-traps.—A valve device particularly adapted for draining condensed steam from radiator pipes comprises a guided lift valve 20 fitted with a depending skirt 19 and arranged in a pocket formed in a stop valve casing. The stop valve which is of ordinary construction controls the passage of steam from the inlet 2 to the outlet 1. The drain valve is guided by a spindle 21 adapted to work in a socket 18 in a removable cap 17. The skirt 19 on the valve member 20 works loosely in a chamber 16 connected to the inlet by a passage 14 so that inlet pressure holds the valve against a conical seat 15 so long as that pressure is maintained. When the pressure is cut off, the valve falls and condensation in the outlet drains back into the inlet.

174,632. Cabanes, E. Jan. 27, 1921, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

FIG. 1.

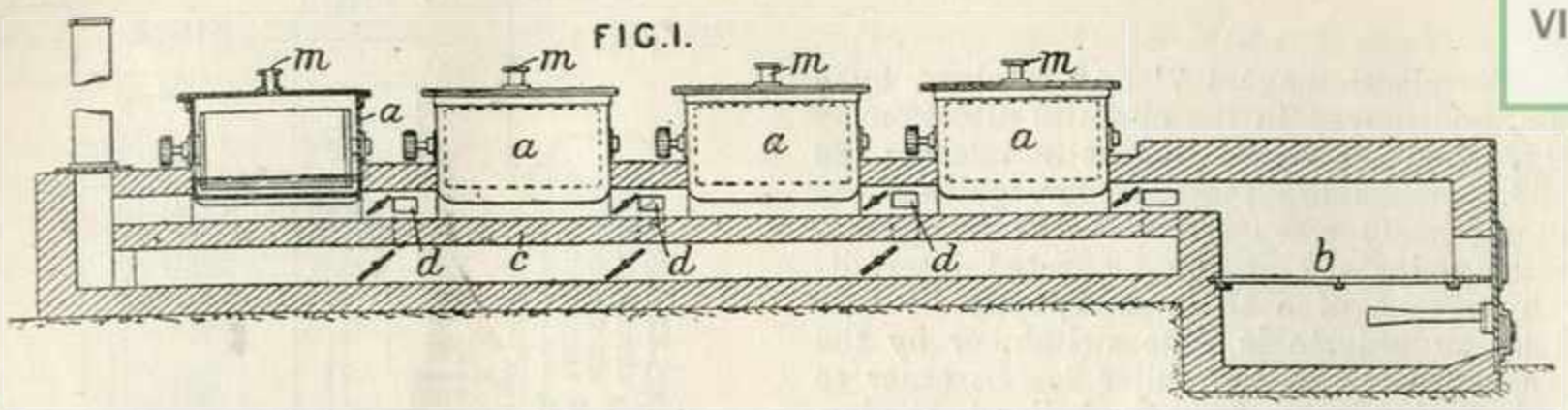


Radiators. — Radiator units are constructed with projecting inclined ribs *e* forming air passages when the units are abutted. The sections may be joined by annular projections round the openings *f* at top and bottom, fitting into corresponding grooves on adjacent elements, or by autogenously welding a tube along the top and bottom with openings to each section.

174,690. Thermal Industrial & Chemical (T.I.C.) Research Co., Ltd., Duckham, Sir A. M., and **Morgan, J. S.** Oct. 20, 1920.

Heating systems and apparatus.—In heating solids or liquids by immersion in a molten metal, either by carrying the material through the metal

FIG. 1.



by contact with a moving drum or other surface as described in Specification 174,974, or, in the case of a liquid, by causing it to travel against a stationary inclined surface submerged in the metal as described in Specification 170,617, [*Class* 64 (i), Heating liquids &c.], the material is submitted to successive different temperatures either by passing it in succession through a series of bath of different temperature, or by regulating the time of successive immersions by varying the speed of movement of the drum or other surface or by varying the inclination or length of the submerged inclined surface. The material may be permitted to cool between the successive immersions. In the fractional distillation of tar oil, the oil is passed in succession through a series of stills *a* of the kind described in Specification 174,974, heated by gases from a furnace *b*, passing along a flue above a horizontal partition *c*. Portions of the hot gases may be passed through by-pass flues *d* to a lower flue so as to regulate the temperatures of the stills. The vapours generated in each still pass through outlets *m*. The process is applicable to the destructive distillation of wood.

174,771. Read, J. C. C., Duddy, D. E., and **Godfrey, W. H.** Nov. 8, 1920.

FIG. 1.

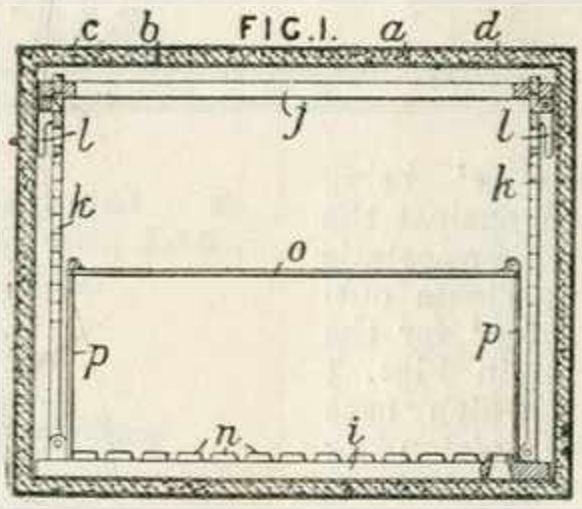
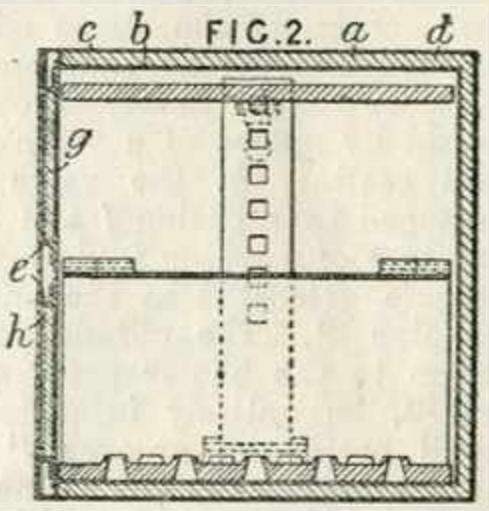


FIG. 2.

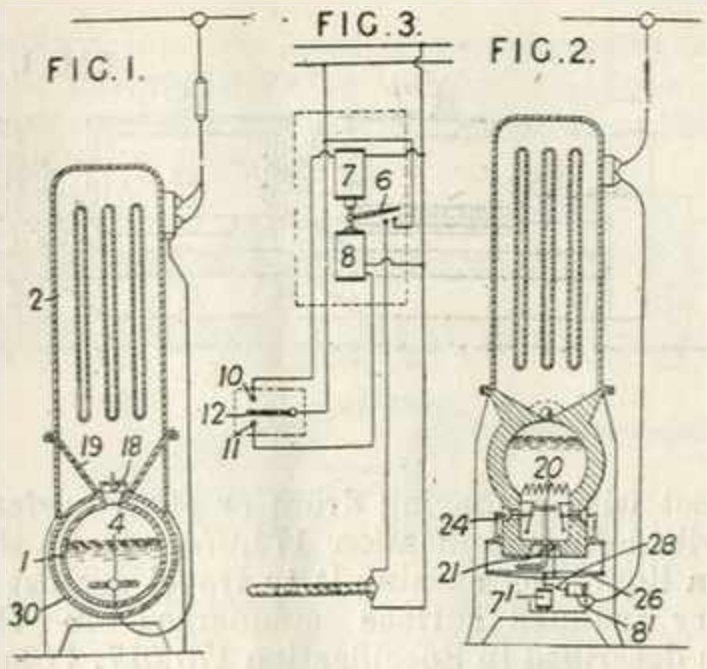


Heat-storing apparatus.—In a cooking appliance of the type in which superposed heated metal plates are employed that can be brought into contact to be simultaneously heated, the upper heating plate is adjustably carried so that the distance between the upper and lower plate can be readily varied. As shown, the cooker *a* is formed of hollow walls *b*, *c* of metal filled with heat-insulating material *d* and is provided with an opening at the front closed by doors *e* having glazed inspection apertures *g* and a door *h* fitting against the doors *e*. The bottom plate *i* which is provided with holes *n* has pivoted thereto slotted bars *k* which adjustably support the top plate *j* by means of catches *l*. A shelf *o* with pivoted legs or side plates *p* divides the space between the heating plates into two compartments. In a modified arrangement the heating plates are connected at the corners by pairs of hinged links.

174,774. Balda, J. A. O. Nov. 10, 1920.

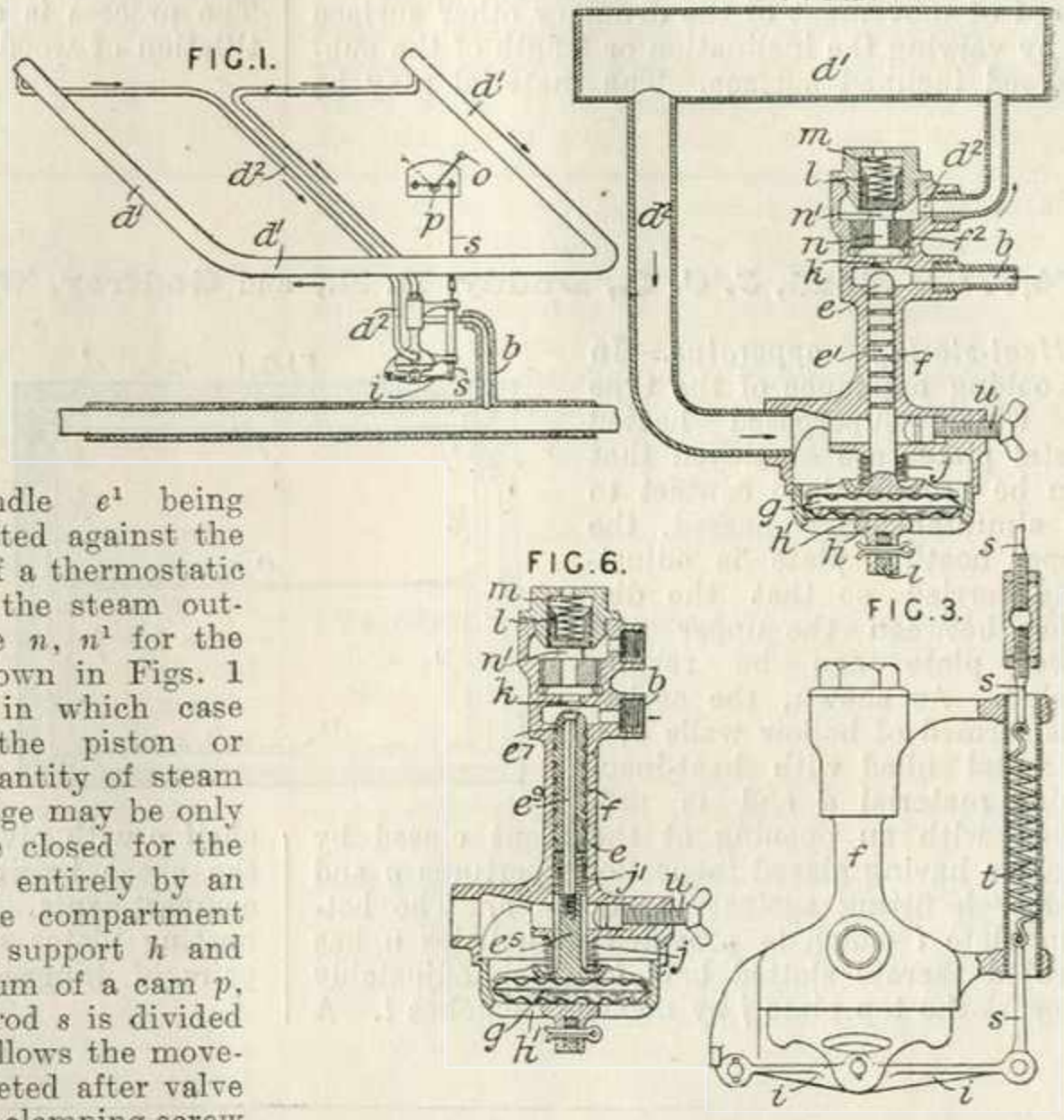
Radiators; thermostats.—In a radiator for heating buildings &c. of the kind comprising a liquid-heating chamber 1 communicating with a heat-radiating body portion 2 by a passage controlled by a valve or similar means 18, the valve is intermittently and automatically opened by the steam pressure in the chamber or boiler 1, and the heat is supplied intermittently to the liquid so as to maintain the temperature of the radiator between two predetermined limits. In the construction shown in Fig. 1, an electric heating-element 4 is employed, the current to which is regulated by a switch 6, Fig. 3, which is opened or closed according as one or other of two electromagnets 8, 7 is energized, a thermostat 12 co-operating with adjustable contacts 10, 11 at the two limits of temperature to complete the circuits through the electromagnets. In a modification, Fig. 2, the heating is effected by a gas burner 20, to which the supply of gas and air are controlled by valves 21, 24 respectively, the valves being actuated by a lever 26 moved in one direc-

tion by the electromagnet 7^1 and retained by a catch 28, and moved in the opposite direction by a spring, when the electromagnet 8^1 releases the catch 28. Means are provided for igniting the gas automatically when the valve 21 is opened. The heating, instead of being effected intermittently by means of a thermostat, may be controlled by an adjustable time switch, or by the pressure generated in the boiler 1. In order to prevent radiation losses from the boiler 1, the latter is preferably surrounded by a vacuum 30 or other insulation. The lower walls 19 of the body 2 are sloped inwardly so as to return condensed water to the boiler 1.



174,926. Pottier, J. F., and **Lannois, L.** Feb. 3, 1921, [*Convention date*].

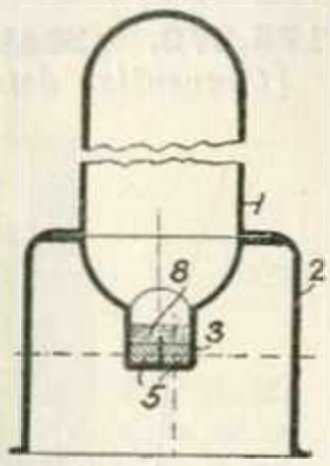
Heating vehicles; thermostats.—The admission of steam into each separate heater d^1, Figs. 1 and 2, of a railway train or like heating system is controlled by a piston-valve l which is normally held open by a spring m, but tends to close under the steam pressure entering from the feed-pipe b, while a further control of the steam admission effected by the temperature of the heater is obtained by means of a valve e and seating k, the valve spindle e^1 being arranged in a casing f and actuated against the pressure of a spring j by means of a thermostatic capsule g located at the end of the steam outlet pipe d^2. The normal passage n, n^1 for the steam to the heater may, as shown in Figs. 1 and 2, be entirely interrupted, in which case small peripheral grooves f^2 on the piston or similar passages admit a small quantity of steam to the heater, or the normal passage may be only restricted. The valve e may be closed for the purpose of cutting out the heater entirely by an operating-handle o located in the compartment and adapted to lift the capsule support h and valve spindle e through the medium of a cam p, rod s, and pivoted lever i. The rod s is divided by an interposed spring t which allows the movement of the handle o to be completed after valve e has engaged the seating k. A clamping-screw u is provided to engage the spindle so as to retain the valve e in its closed position, for example, when it is desired to substitute a new capsule. Blowing off or draining away of the condensed water takes place through the outlet pipe d^2 and openings h^1 in the capsule support h. In a modification, the piston valve, instead of being operated entirely independently of the valve spindle e^1, is mounted on the latter so as also to be actuated by the capsule g. In a further modification, the piston valve has lateral ports and is arranged to slide over the valve spindle e^1, a spring being interposed between the piston valve and a shoulder on the valve spindle e^1. In still further modifications, the valve spindle e^1 is made in two parts with an interposed spring j^1, Fig. 6, and the lower part e^5 has a square-sectioned rod e^9 passing through a circular passage in the upper part e^7. When, owing to the expansion of the capsule g, the upper part e^7 engages the seating k, the lower part e^5 and rod e^9 continue their movement, thus placing the feed-pipe b into communication with the atmosphere through the passage in the part e^7 and giving a more direct blow-off of the condensed water. The use of the spring j^1 avoids the necessity of the spring t between the two parts of the rod s, as shown in Fig. 3.



174,937. Topp, W. B. Feb. 5. 1921. [*Convention date*].

Radiators.—An electrical heating-apparatus comprises a closed chamber 1, and an attached or integral receptacle 3 at the lower end thereof containing electrodes 5 separated by imperforate insulating partitions, the electrodes being connected to a source of alternating current and having their upper surface below the top of the partition; the receptacle is filled, when cool, with a vaporizable conducting liquid to a level above the partition so that as the liquid vaporizes the current varies with the volume of the liquid. The chamber 1 and the receptacle 3 may be made of metal lined with an insulating enamel or the receptacle 3 may be of porcelain and may contain four electrodes separated by three partitions. Acids or salts may be added to the water to increase its conductivity.

FIG. 1.



The Specification as open to inspection under Sect. 91 (3) (a) states that mercury may be used as the vaporizable liquid. This subject-matter does not appear in the Specification as accepted.

174,974. Thermal Industrial & Chemical (T.I.C.) Research Co., Ltd., and **Morgan, J. S.** Sept. 7, 1920.

FIG. 2.

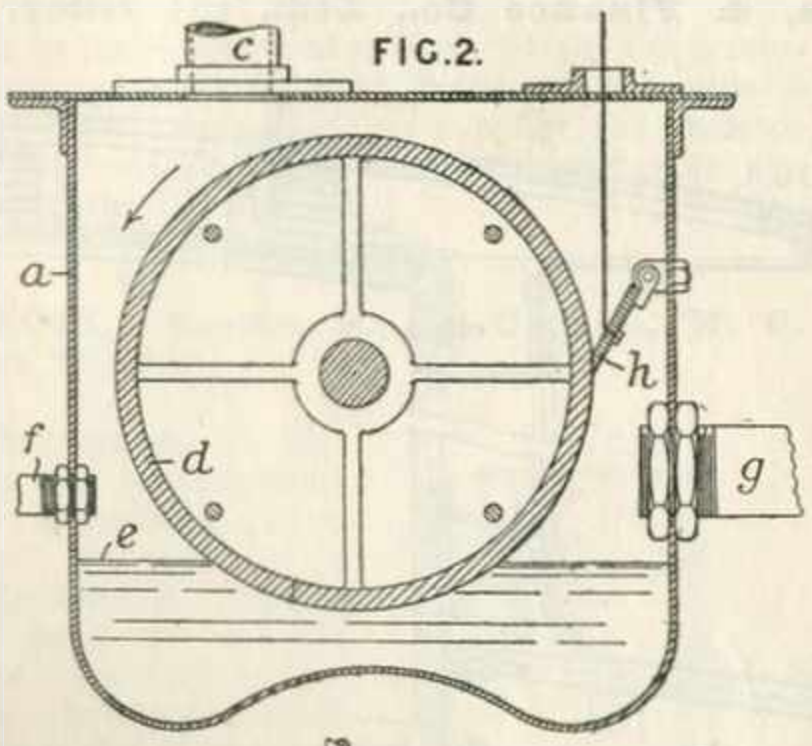
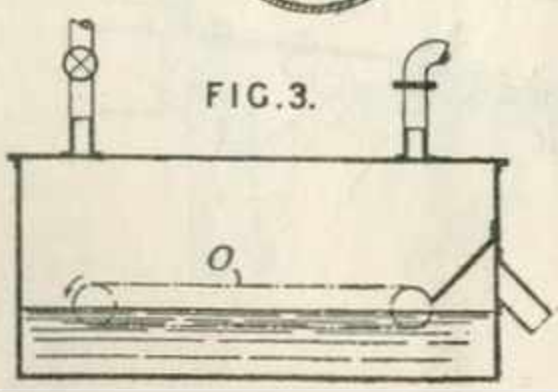


FIG. 3.



Heating systems.—Material, such as liquid or subdivided solid, is subjected to heat treatment in contact with molten metal, and is carried into the molten metal as a film or layer by means of a travelling surface such as a rotating drum or endless band. A still for dehydrating tar or oil comprises a closed vessel *a* containing molten lead *e* and having a rotating drum *d* partly immersed in the metal. The hydrated tar enters by a pipe *f* and floats on the surface while it is gradually brought into contact with the drum *d* and carried into the metal. The dehydrated tar leaves by the pipe *g*, and vapour by the pipe *c*. A scraper *h* may be provided to remove the tar from the surface of the drum. In a modification, Fig. 3, which is particularly applicable for distilling carbonaceous material such as sawdust, the material is carried into the molten metal by an endless band *o*. Other applications mentioned are the drying of powders or crystals such as chalk or sodium bicarbonate, the distillation of calcium acetate, and the evaporation of liquids. Specifications 14617/95, [*Class* 55, Gas manufacture &c.], 19305/11, [*Class* 39 (iii), Heating by electricity.], and 25698/12, [*Class* 50, Fuel, Manufacture of], are referred to.

175,024. Freeman, N. H. Nov. 4, 1920

FIG. 1.

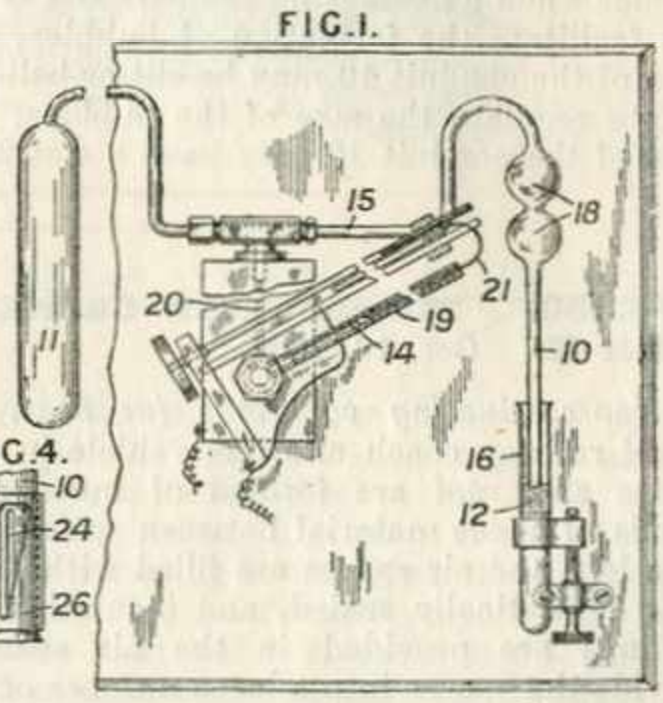


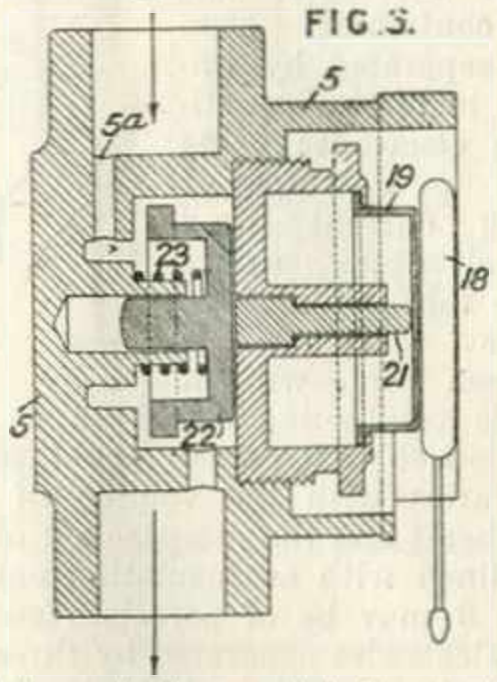
FIG. 4.

Thermostats.—Relates to temperature-controlling devices for furnaces and like apparatus of the type, such as described in Specification 120,590, in which a holder 11 for fluid, such as air, placed in the furnace controls a movable operating-member, such as a column of mercury 14 in a tube 19 communicating with a mercury container 20, and so regulates the heat supply. An automatic pressure-operated valve is provided communicating between the holder 11 and the surrounding atmosphere so as to act as a safety-valve in case of undue expansion or contraction of the fluid and also to permit a gradual increase or decrease in the temperature being controlled. In the construction shown, the valve is in the form of a liquid seal, constituted by the liquid 12 in an adjustable tube 16, adapted to close the

lower end of a conduit 10 which communicates by a tube 15 with the holder 11. In the normal operation of the apparatus, when a fixed temperature is to be maintained, the holder 11 is heated in the furnace, allowing free expansion of the fluid, until the required temperature is reached, and then the end of the conduit 10 is sealed. The mercury column 14 co-operates with the contact 21 to regulate the heat supply without the seal being effected. In case of any undue expansion in the holder 11, however, the sealing-liquid would be forced out of the conduit 10 and some of the air would escape, instead of mercury being driven out of the tube 19; conversely, if any undue contraction occurred, the sealing-liquid would be sucked up into expanded portions 18 of the tube 10 and more air admitted into the holder 11, instead of mercury being sucked back into the holder. When it is desired to allow a gradual increase in the temperature to be controlled, the level of the sealing-liquid is arranged so that in the "lag" period that occurs between the time at which the mercury column first contacts with the contact 21 and the time at which the expansion reaches its maximum a bubble of air is allowed to escape from the holder 11. The next contact is thus made at a temperature higher than that at which the first contact was made, dependent upon the size of the air bubbles released, and so on. Conversely, bubbles of air can be successively admitted to the holder when a decreasing temperature is required. To facilitate the formation of bubbles, the lower end of the conduit 10 may be slit or bell-mouthed, or, to regulate the size of the bubbles, the lower end of the conduit 10 may have a slot 24, Fig. 4, co-operating with a rotary sleeve 26 perforated at 27. Specifications 9457/91 and 11308/10 also are referred to.

175,272. Maladry, H. J. Feb. 9, 1921. [*Convention date*].

FIG. 3.



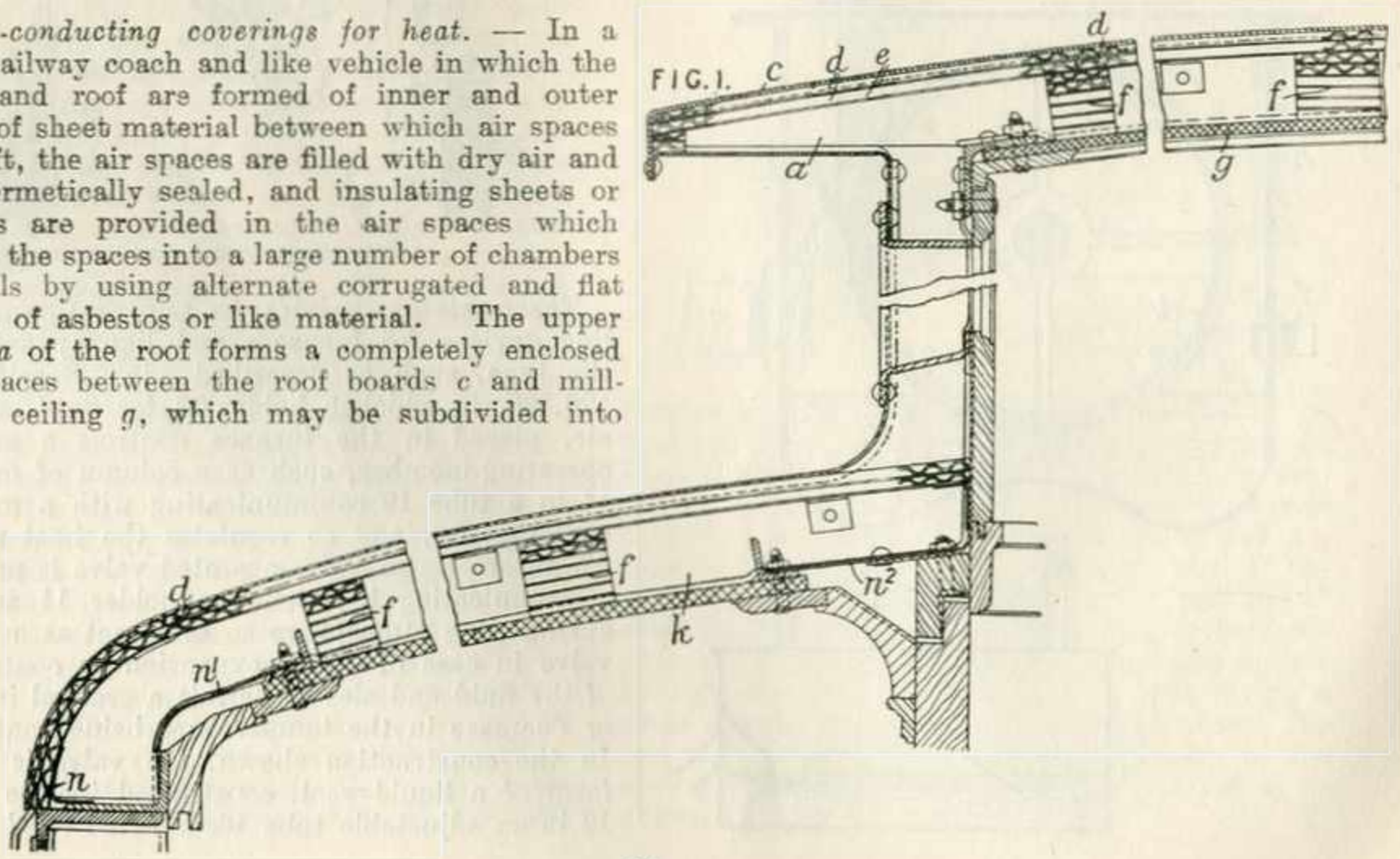
Thermostats.— A thermostat for controlling the supply of gas to the burner of a water heater is placed on the side of the container near to the point at which cold feed is delivered. A capsule 18 containing for example methylated spirit on dilatation through heat forces a guided member 19 against a rod 21 pressing the valve 22 against the pressure of a spring 23 on to its seat, closing the passage 5^a through which gas is supplied.

Reference has been directed by the Comptroller to Specifications 223/08 *and* 11072/08.

175,350. Metropolitan Carriage, Wagon, & Finance Co., Ltd., and **Hiley, Sir E.** Oct. 18, 1920.

Non-conducting coverings for heat. — In a steel railway coach and like vehicle in which the sides and roof are formed of inner and outer walls of sheet material between which air spaces are left, the air spaces are filled with dry air and are hermetically sealed, and insulating sheets or linings are provided in the air spaces which divide the spaces into a large number of chambers or cells by using alternate corrugated and flat sheets of asbestos or like material. The upper deck *a* of the roof forms a completely enclosed air spaces between the roof boards *c* and mill-board ceiling *g*, which may be subdivided into

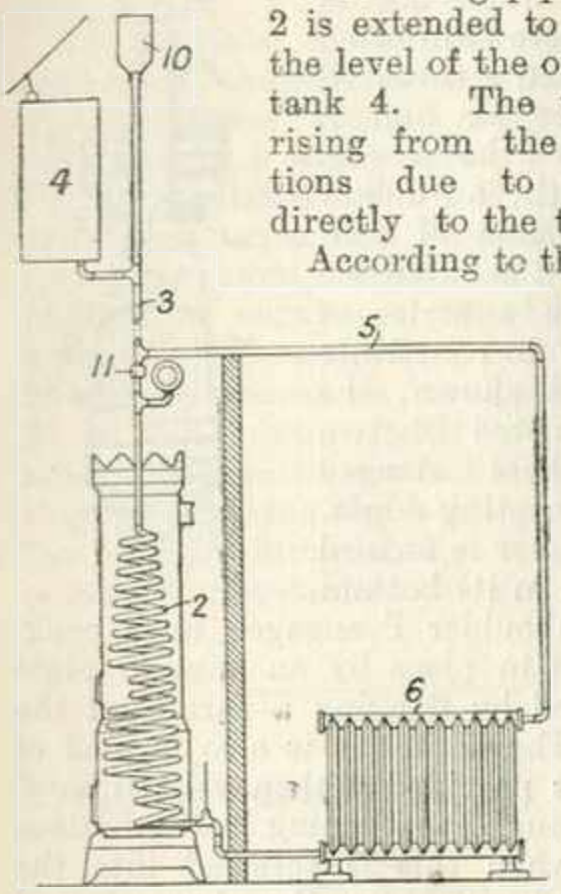
FIG. 1.



compartments. Cemented to the inner surface of the roofboards are two layers of insulation *d* formed of corrugated asbestos or like sheeting with interposed layers of flat sheet asbestos *e*, forming sections of honey-comb form. Spacing blocks *f* are arranged at intervals between the roof boards *c* and the ceiling *g*.

175,956. Johansson, C. Feb. 19, 1921, [*Convention date*].

Heating by circulation of fluids. —The rising pipe 3 from a boiler 2 is extended to a tank 10 above the level of the ordinary expansion tank 4. The water and steam rising from the boiler in pulsations due to over-firing pass directly to the tank 10.

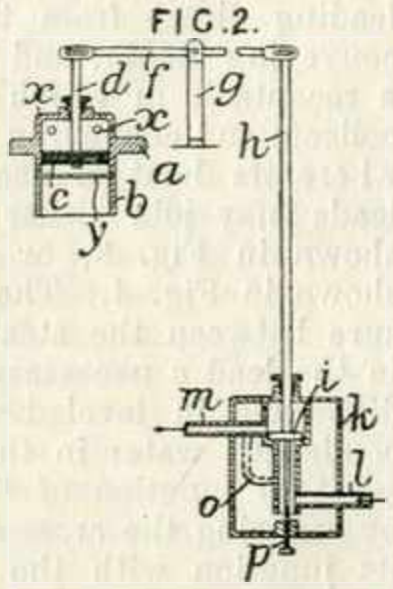


According to the Specification as open to inspection under Sect. 91 (3) (a) a non-return valve 11 may be fitted on the pipe 3 below the branch 5 which supplies the radiator 6. This subject-mater does not appear in the Specification as accepted.

176,046. Cooke, J., and **Croxon, W. C.** Oct. 25, 1920.

Thermostats. — Relates to thermostats for controlling the supply of heat to a fluid-container wherein the pressure of the vapour generated controls a valve or switch through the medium of a movable member connected to the valve or switch by rods or levers. The fluid containing vessel is provided in its upper wall *a* with a chamber *b* open at the bottom in which slides a piston *c* carried by a rod *d* which extends through the lid or cover of the vessel and is pivotally connected to a fulcrumed lever *f* having attached to its other end a rod *h* connected to a valve for controlling the gas or oil supply or to a switch controlling the supply of electricity. In the construction shown, the valve *i* is mounted directly on the rod, and controls the flow of gas from an inlet *l* in a casing *k* to the outlet *m*, entire cutting-off of the gas supply being prevented by a by-pass *o* or by an adjustable stop *p* for the valve. When the piston *c* rises to the top of the chamber *b*, apertures *x* permit the escape of steam or the like, and excessive downward movement of the piston is prevented by stops *y*. In place of flat disc valve *i*, the rod *h* may be pivoted to a further rod actuating a rotary cock. When applied to a kettle, the chamber *b* is arranged on the lid, and the supporting-rod *g* for the lever *f* is clamped to the gas-supply pipe.

FIG. 2.



176,132. Shaw, J. K. Dec. 1, 1920.

FIG. 1.

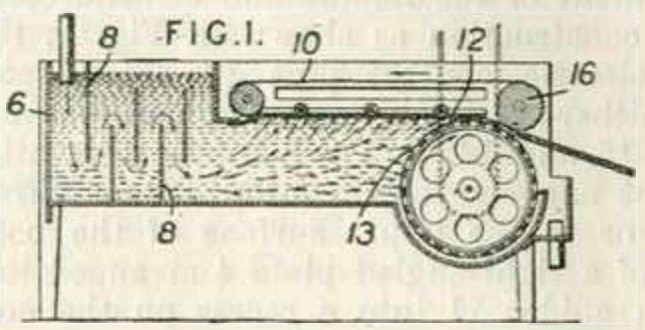
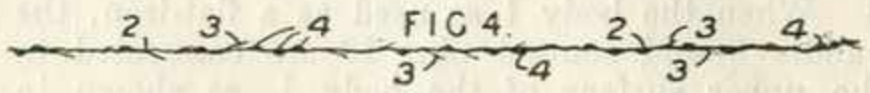
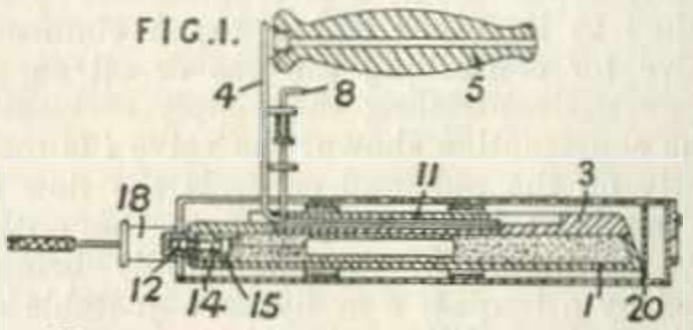


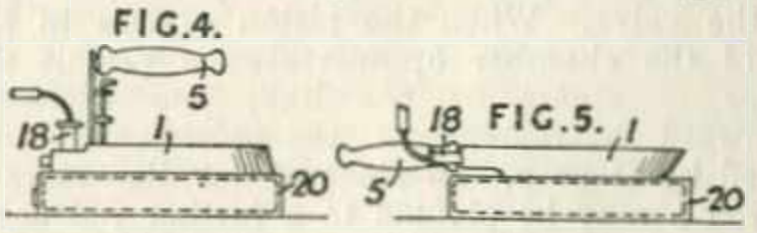
FIG 4.



Non-conducting coverings for heat. — A heat insulating material for wall coverings is made from bagasse or similar fibres which have been only partially cooked so that some of the pith 4, Fig. 4, is left adhering to the fibres as protuberances, and some broken fibres 3 project from the fibrous bundle 2 to assist in producing a felting effect, such as is found in wool fibres. A mixture of the fibres, after they have been beaten and screened, and water is introduced into a tank 6, Fig. 1, and after flowing over baffles 8, the water flows away through a perforated travelling apron 10, and a rotating perforated cylinder 13, leaving the fibre adhering to these surfaces. Further fibres flow into the angle 12 between these surfaces and the whole mass of entangled fibres after light pressure by a roller 16 leaves the machine. Fibres such as those from wood &c. may be mixed with the bagasse fibres. In the preparation of the fibres water soluble compounds are formed by the alkali and the outer casing material of the bagasse, and these can be reprecipitated upon the fibres by aluminium sulphate to assist in binding them together. The fibres may be beaten by means such as a Hollander to form bundles of differing sizes.

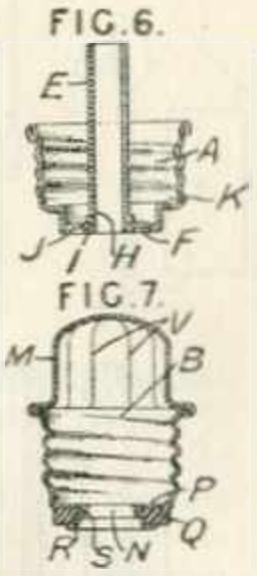
176,259. **Muntwyler, E.** March 18, 1921.





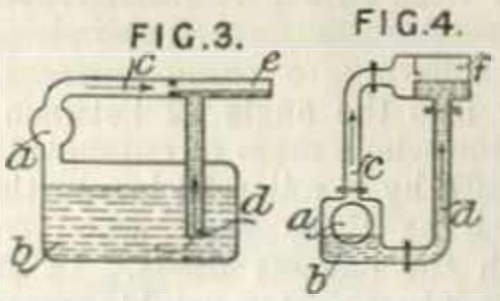
Foot-warmers; bed-warmers. — An electrical heating-apparatus comprises a heating body 1 and a housing 20 for the same, the heating-body having on two different sides means for attaching a handle 5 and electric contact-making means 14, 15 whereby the apparatus may be used as a flat-iron and stand, or as a chafing-dish, or as a bed-warmer or as a footwarmer according to the arrangement of the handle and electric contacts. In the construction as shown in Fig. 1, the external electric contact pins 18 are adapted to enter either vertical or horizontal insulating sleeves 15 and 14, and the handle 5 is attached either at one end of the body 1 to a threaded-pin 12 or to the upper surface of the body by means of a right-angled plate 4 arranged to slide between guides 11 into a recess on the cover 3 of the body and to be locked therein by a latch 8 When the body 1 as used as a flat-iron, the handle 5 and contact pins 18 are connected to the upper surface of the body 1, as shown in Fig. 4, and the housing 20 forms a stand. For converting into a chafing-dish, the handle 5 and contact pins 18 are connected to the end of the body as shown in Fig. 5. For using as a bed-warmer, the body 1 is first heated and placed in the housing and the handle and contact pins 18 are detached; for using as a foot-warmer the handle and contact pins are connected to the end of the body which is placed inside the housing.

176,307. Schrader's Son, Inc., A., (Assignees of *Kraft, H. P.*). March 1, 1921, [*Convention date*].



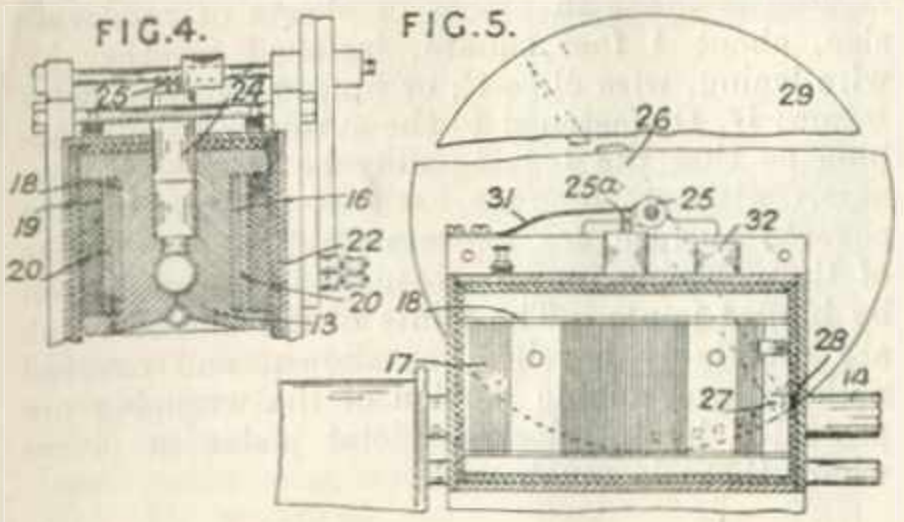
Hot-water bottles. — In a closure device for water bottles &c. comprising a screw-threaded socket A, Fig. 6, and a threaded sheet-metal stopper B, Fig. 7, adapted to enter the socket and provided with a hollow dome-shaped extension M constituting a handle, the extension M is formed with a series of longitudinal ribs V to constitute finger holds. As shown, the stopper is constructed of two cup-shaped members flanged together at their meeting edges, and the lower member is formed with an opening N in its bottom surrounded by a shoulder P engaged by a packing washer Q held in place by an annular plate R which is secured by flanging a part S of the bottom over it. The socket A is also formed of sheet metal and is provided with a vent tube E which projects through the opening in the bottom of the stopper, when this is screwed into the socket, and extends up into the dome-shaped extension M. The tube E is secured in a central hole in the bottom F of the socket by flanges H, I on the tube. The socket has additional holes J for the passage of the water into the bottle and a shoulder K forming a seat for the stopper.

176,347. Friedmann, A. [Firm of]. March 2, 1921, [*Convention date*].



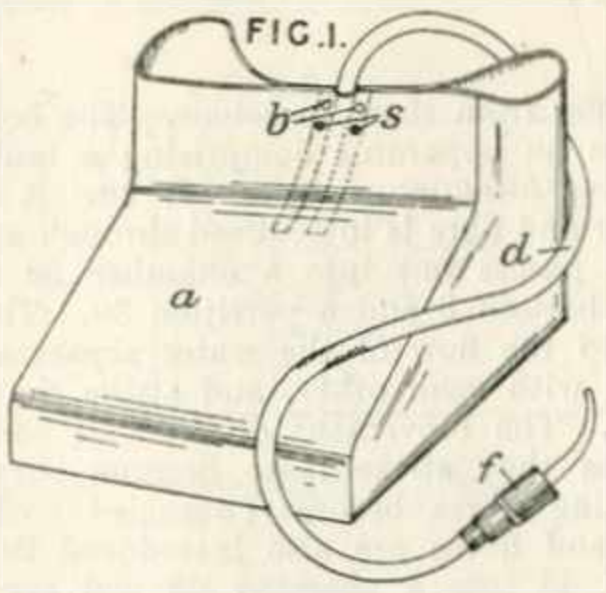
Heating buildings and vehicles.—In order to drain the main pipes *a* of a steam heating system for railway vehicles or the like during the normal working, two leads *c*, *d* to each of the heating elements or radiators are provided, one *c*, leading direct from the main steam pipe and conveying steam, and the other, *d*, leading from a receptacle in which the water of condensation collects and conveying the water into the heaters, where its heat is usefully employed. The two leads may join either in the feed pipe *e*, as shown in Fig. 3, or in the heater *f* itself, as shown in Fig. 4. The difference in steam pressure between the steam in the pipe *a* and that in the lead *c* necessary to maintain the requisite difference in level between the surface of the condensed water in the receptacle *b* and at the point of junction of the leads *c*, *d* is obtained by reducing the cross-section of the lead *c* before its junction with the lead *d*. The condensed water is drained from the heaters in any usual manner.

176,472. Godfrey, A. Dec. 2, 1920.



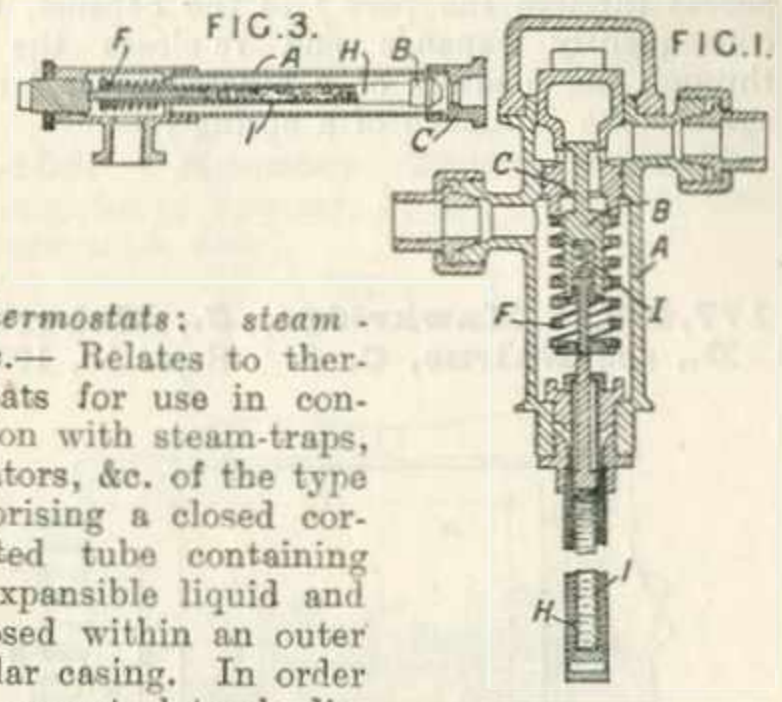
Thermostats. — In an oxygen metal-cutting apparatus, the temperature to which the separate stream of cutting oxygen is heated, is indicated by a thermometer placed in a recess 32 and is regulated by a thermostatic device comprising an expansible block or fluid operating a spring or cavity controlled plunger 24. The plunger 24 engages at the limiting temperature a pin 25 on a crank 25^a operating a pointer needle 26 and so moves an insulated electrical contact 27 on the pointer needle out of contact with an adjustable electric contact 28 on the dial plate 29, thereby breaking the heating circuit. When the temperature diminishes, a spring 31 operates the pointer to re-establish the circuit.

176,552. Howarth, R. Dec. 22, 1920.



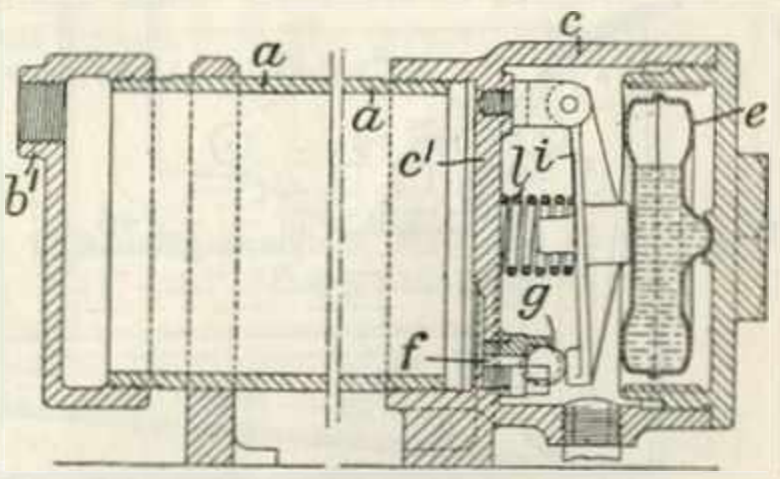
Hot-water bags and the like.— A foot-warmer in which the warmth of a person's breath is used comprises a bag or hood *a* of waterproof material which is open at the top and adapted to contain the feet, and a tube *d* to convey the warm breath from the mouth to the bag. Press studs or fasteners *b* close the bag round the ankles. Eyelet vents *s* may also be fitted. Non-return valves are located in the mouthpiece *f* and in a box at the end of the tube within the bag or hood.

176,939. Horne, A. D. Jan. 8, 1921.



Thermostats: steam-traps.— Relates to thermostats for use in connection with steam-traps, radiators, &c. of the type comprising a closed corrugated tube containing an expansible liquid and enclosed within an outer tubular casing. In order to prevent lateral displacement or buckling of the thermostatic element 1 while permitting its axial expansion, the element is arranged in close contact with the surrounding casing H. Preferably the liquid contained in the element is olive oil or castor oil. In the construction shown in Fig. 1, the casing A and expansion of the element 1 forces the valve B on to its seating C against the action of a spring F, a light spring I being provided to compensate for over-expansion. In modifications applicable to the control of the steam admission to a radiator or of the discharge of condensed water from a steam-trap, as shown in Fig. 3, the casing H is movable with the valve B against the action of a spring F when expansion of the element 1 takes place.

177,094. Wild, A. G. May 23, 1921.



Radiators; steam-traps.—Relates to radiators for heating railway vehicles &c. of the kind, such as described in Specification 19980/13, in which the temperature is controlled by a thermostatic capsule containing methyl alcohol or like fluid. The heater *a* is in free communication at one end b^1 with the steam supply, while the capsule *e* is located in a chamber *c* at the opposite end and is adapted to operate a valve *g* for controlling the outflow of condensed water through a port *f* in a partition c^1 separating the chamber *c* from

been drained from the heater, the steam has access through the port *f* to the capsule, which consequently expands and re-closes the port through the medium of a pivoted lever *i* acting against the influence of a spring *l*.

177,468. Hawkridge, J., Robertson, D., and **Nairne, C. J.** Sept. 19, 1921.

FIG. 1.

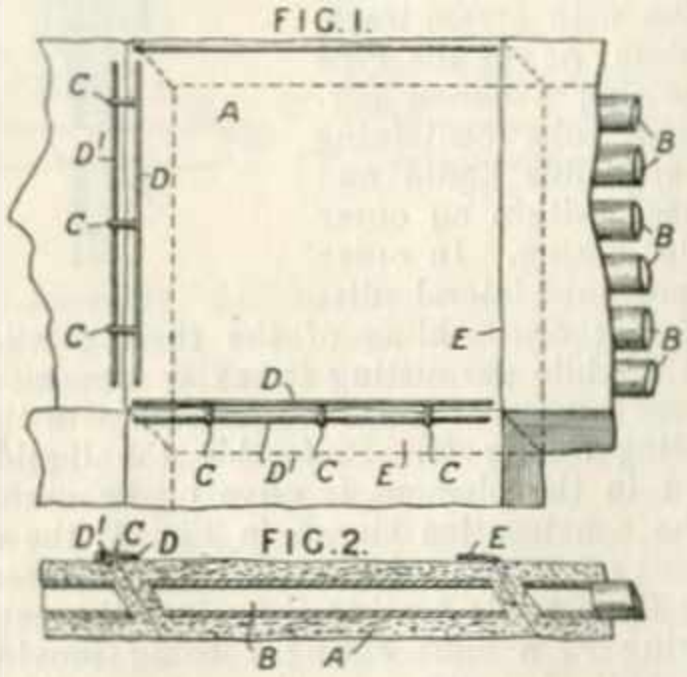
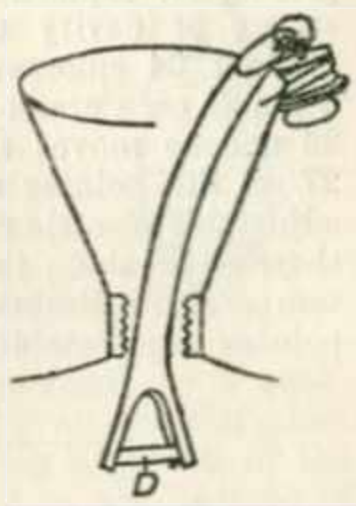


FIG. 2.

Non-conducting coverings for heat; *fire-proof coverings.*—Air-filled tubes of asbestos millboard or other fire-resisting material of low thermal conductivity are inserted in a mattress A of felted fibres of the same or similar material enclosed in a wrapping also of like material to form a covering or lagging for boilers &c. The lagging is made in blocks or sheets of moderate size, about 1 foot square, fastened together by wire lacing, wire clips C, or hinged joints on wire frames D, D¹ fastened to the surface of the wrapping so that the lagging may be readily removable, without damage, when repairs to the covered surface are necessary. The end blocks of the covering may be secured to an angle-iron by hinged joints. The joints of the blocks which are preferably bevelled, as shown, and covered with an overlapping portion of the wrapping are protected by interlocked metal plates in places where there is much wear.

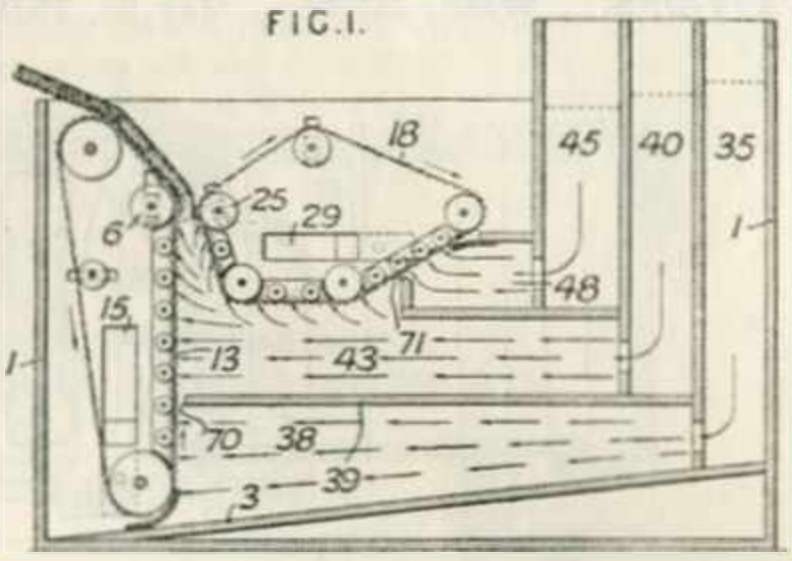
177,473. Dufton, A. F. Dec. 28, 1921.

Hot-water bottles. — A rubber tube to act as an air-vent in filling hot-water botles is attached by a swivel connection to the stopper and is slit at its lower end and kept extended by a cross-piece D.



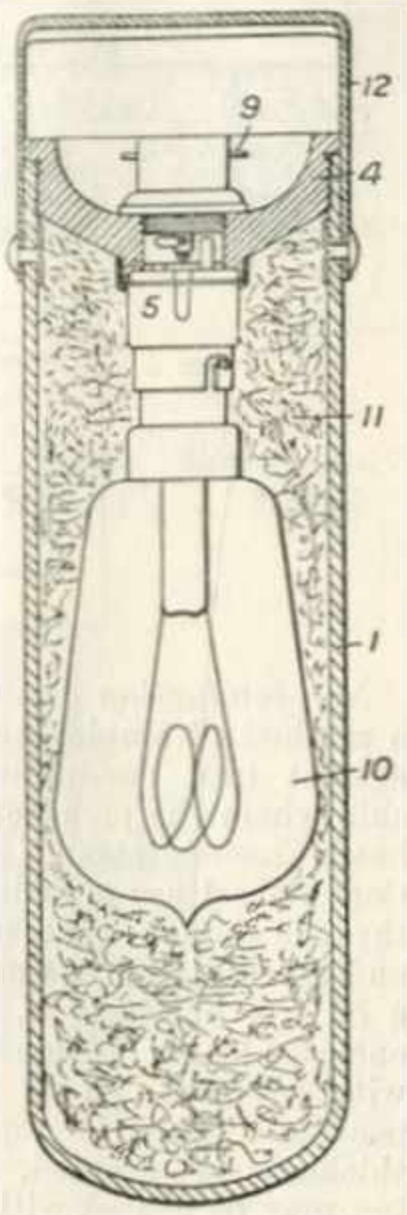
177,835. Shaw, J. K. Dec. 1, 1920.

FIG. 1.



Non-conducting coverings for heat. — Fibre boards are composed of different layers of fibres, the fibres of each layer being interlaced, and the fibres of one layer being interlaced with the fibres of adjacent layers in the manner described below. The inner layer is composed of large fibres to give the requisite air spaces in the body of the board. One or more layers may be fireproofed or waterproofed, and the outer layers may be of higher quality fibres than the inner layers, and may differ from them in colour. The boards are made in an apparatus comprising a tank 1 and travelling foraminous belts 13, 18. A mixture of water and fibre is introduced through a channel 35 and passes out into a chamber 38 between a false bottom 3 and a partition 39. The fibres owing to the flow of the water separate, travel parallel with each other, and strike the belt 13 end on. The movement of the belt causes the fibres as they strike it to become curved and succeeding fibres become entangled with them. Water and fibres are also introduced through a channel 45 into a chamber 48 and such fibres adhere in a similar manner to the belt 18. A third set of fibres introduced through a channel 40 into a central chamber 43 is caused to adhere to the fibres on the belts 13, 18, as they emerge from the openings 70, 71 from the chambers 38, 48. The fibres as they pass out are compressed into a board by the adjustable pressure rollers 6, 25. The heads of liquid in the channels 35, 40, 45, and the orifices 15, 29 through which the water escapes may be adjusted to minimize any flow from one chamber to another and to give the requisite flow of liquid. If more than three layers are required additional channels and chambers are provided.

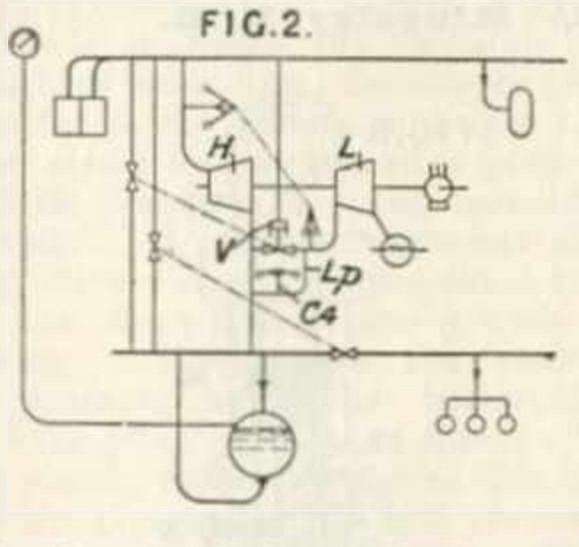
177,920. Rose, K. W. Jan. 29, 1921.



Bed-warmers; heat-storing aparatus.— In a bed-warmer or like warming-apparatus of the type comprising a receptacle or casing 1 containing an electric filament lamp 10, the receptacle is packed with asbestos or like heat-conserving material 11 arranged in direct contact with the bulb of the lamp. The lamp-holder 5 is connected to the casing by means of a screw-threaded annulus 4 and has projections 9 and contacts for connecting the lamp to a source of supply. A bow-shaped handle 12 is pivoted to the upper end of the casing for convenience in carrying.

178,081. Aktiebolaget Vaporackumulator. April 2, 1921, [*Convention date*]. *Addition to* 135,478.

FIG.2.



Heating by circulation of fluids.—In a steam power and heating plant of the kind described in the parent Specification, in addition to the steam supply pipe between the motor elements H, L and containing the valve V there is provided a second pipe L*p* containing a governor-controlled valve C_4 which is adapted to supply steam to the low-pressure element when the speed of the engine is reduced even when the valve V is closed. Alternatively, the additional governor C_4 may also control the valve C. Arrangements are described wherein the constructions shown in Figs. 2 and 3 of the parent Specification are similarly modified. A single centrifugal governor may replace the various governors in the ... its lowest position corresponding to the governor C_4.

178,103. Spencer Thermostat Co., (Assignees of *Spencer, J. A.*). April 8, 1921, [*Convention date*].

FIG.1.

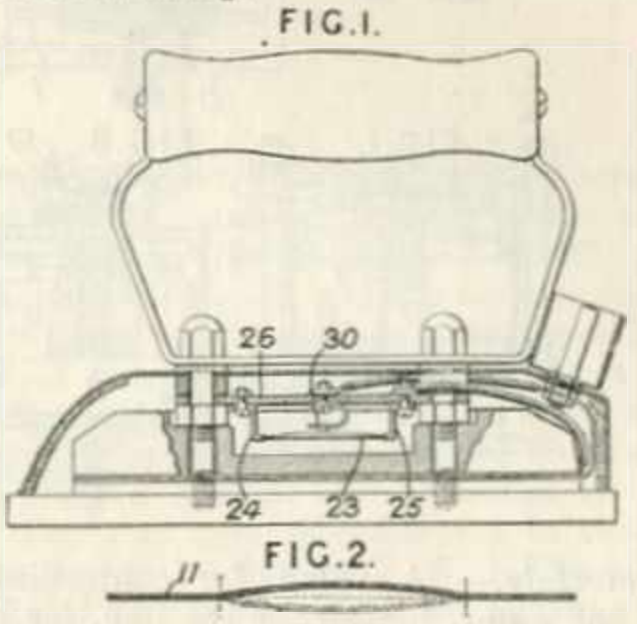
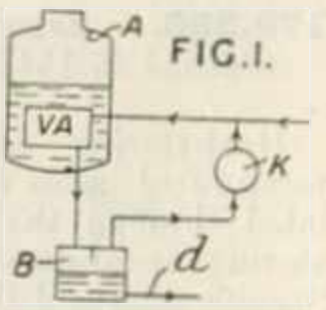


FIG.2.

Thermostats.—A temperature control consists of a member so designed that stresses imposed by variation in temperature are resisted until these stresses overcome the normal resistance, when the member abruptly changes to a shape of opposite curvature. It may comprise a strip, bar, disc, &c. 11, Fig. 2, of two metals joined together by welding &c. and curved, as shown. On reaching the critical temperature, the bar &c. suddenly takes the lower curve. The device may be used for controlling any electric circuits, and is shown in Fig. 1, applied to an electric iron, in which the curved strip 23 is inserted in one side of the electric circuit and is supported by brackets 24, 25 secured to an insulating-base 26. The strip makes contact with a member 30 secured to this base in the other side of the circuit. On the temperature rising above a predetermined point, the curve is reversed and the circuit broken; on the temperature falling, the circuit is again closed.

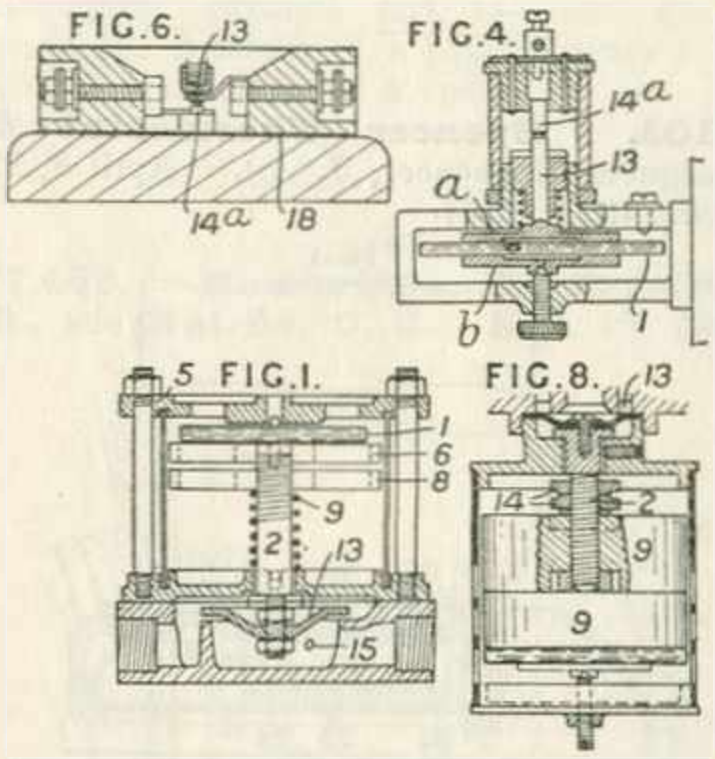
178,129. Hylander, H., and **Grewin, F.** April 11, 1921, [*Convention date*].

FIG.1.



Heating by circulation of fluids.—Steam and condensate from a steam-heated apparatus A pass to a closed container B, whence a compressor, injector, &c. K draws the steam and returns it to the heating space VA. In a modification, any steam generated in the apparatus A is also conveyed to the heating space through a pipe connecting with the compressor &c. K. Condensate may be drawn off at *d* for utilization of the contained heat

178,[illegible]. Wilkinson, G. Oct. 7, 1920.

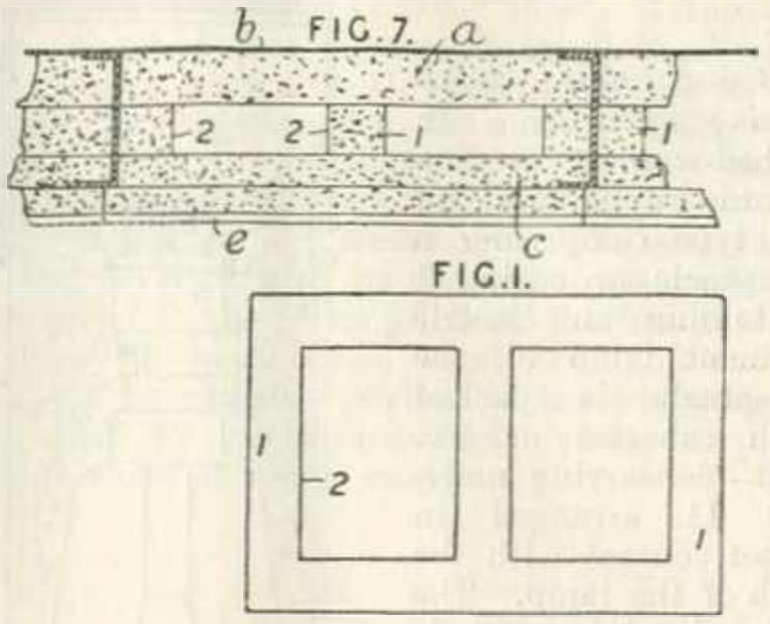


Thermostats.— A valve for controlling gas, steam, hot water, hot air, or the like, for heating purposes, or an electric switch, is actuated by a thermostatic capsule formed of sheet metal having a thickness of 0.001 to 0.006 inch. The capsule 1, Fig. 1, is mounted on a spindle 2 between an adjustable nut 6 and the cover 5 of the casing so that its free expansion may be confined within safe limits. A valve 13 is mounted on the lower end of the spindle 2 and is closed against the pressure of a spring 9, the tension of which may be adjusted by a nut 8. When used for gas, a by-pass opening 15 may be provided. The capsule is filled with a liquid having a boiling point approximate to the temperature required. Fig. 4 shows the application to an electric switch. The capsule 1 is enclosed between plates *a*, *b* the upper plate *a* carrying one of the contacts 13. The other contact 14[a] is carried by the casing. In another modification Fig. 6, the contacts 13, 14[a] are enclosed in a casing which is sealed by rubber diaphragms 18. In another modification, Fig. 8, weights 9 are used instead of a spring and a spindle 2 carries a diaphragm valve 13, the degree of closing being varied by nuts 14.

178,286. Durando, G. March 14, 1921.
Addition to 154,183.

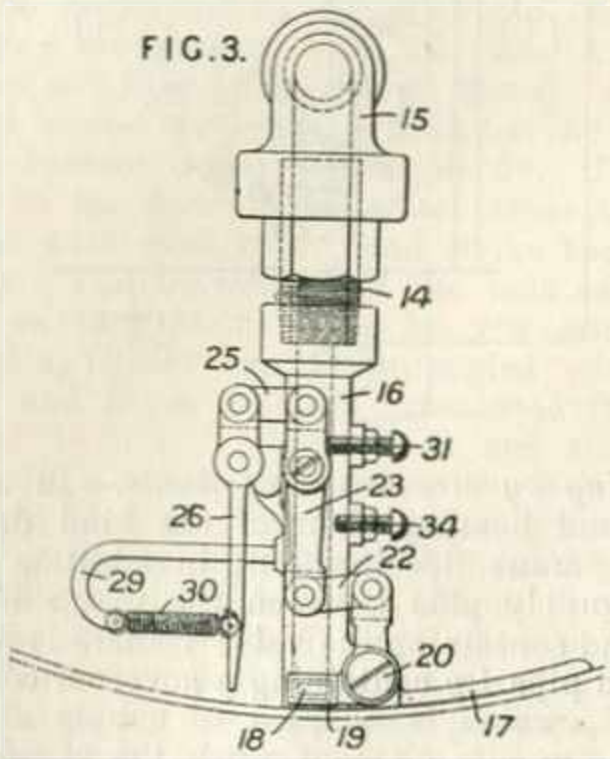
Heat-storing apparatus. — Fluid such as a mixture of gases and vapours or liquid is circulated through the pipes embedded in the heat storing apparatus constructed as in the parent Specification and the circuits thus formed may be closed for utilization elsewhere of the heat absorbed. Circulation may be assisted by pumps.

178,495. Davies, J. Dec. 16, 1920.



Non-conducting coverings for heat.—Relates to a method of employing cork to insulate surfaces against heat conduction, particularly on board ship where the presence of stiffeners on the bulkheads necessitates a great thickness of cork. Cork slabs 1 are moulded with apertures 2 passing through them or recesses or grooves sunk in them and are built up against a primary cork covering *a* on the bulkhead *b*, coated with bitumen and enclosed by an outside cork covering *c* also coated with bitumen, so as to form air-tight cellular pockets. This is repeated until the required thickness is attained, and the final cork covering may be coated with an oxychloride cement *e*. The recessed slabs are used face to face or against plane cork surfaces.

179,058. Kingsley, H. B. April 6, 1921.



Steam-traps.—Water of condensation is removed from an internally steam heated vessel such as a drying cylinder by means moving through the water and operated by impact with it whereby an outlet valve is actuated to permit the automatic escape of the water without loss of

steam. The radial outlet pipe 14 of a steam cylinder leads to the trunnion by an elbow pipe 15, and is provided at its outer end with an arcuate foot 17 bearing against the cylinder wall, and with an opening 18 in its side. This opening is normally closed by a gate valve 19 pivoted at the point 20 and connected by levers 22, 23, 25 to a blade 26 which tends to be held at a fixed distance in front of the nozzle 16 terminating the pipe 14 by a spring 30 secured to a goose neck 29 projecting from the nozzle. When the blade in its rotation receives the impact of the condensation water, it is deflected and opens the valve 19 through the lever system. The extent of motion of the lever 23 is limited in both directions by adjustable screws 31, 34.

179,097. Schrader's Son, Inc., A., (Assignees of *Schweinert, M. C.*). May 5, 1921, [*Convention date*].

FIG.4.

FIG.2.

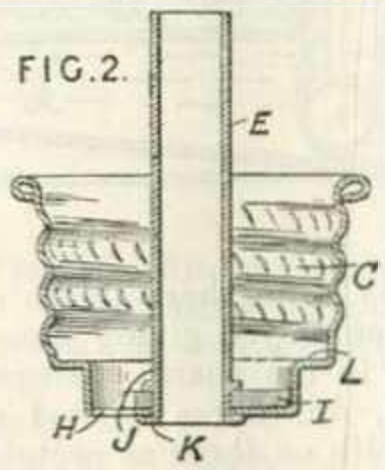
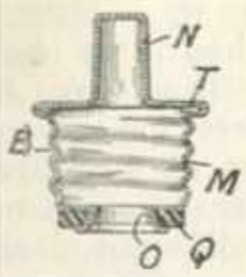


FIG.5.



Hot-water bottles.—Relates to closures for water bottles &c. and particularly those of the type described in Specification 176,307. The socket member C, Fig. 2, and the stopper member B, Fig. 5, are constructed of sheet metal, and the base of the socket is reinforced by a plate I, Figs. 2 and 4, perforated to allow the passage of the vent tube E and also shaped so that the openings therein register with openings H in the socket. The vent tube is connected to the plate I and the socket by flanges J, K. The stopper B consists of two parts united by a flange at T, has a flattened-cylindrical portion N which constitutes a manipulating-handle and a reception chamber for the vent tube, the lower member being threaded at M. An opening O is provided for the reception of the tube E, and packing Q is adapted to engage a shoulder L in the socket.

179,153. Krupp Akt.-Ges., F. April 29, 1921, [*Convention date*].

Heating vehicles. — In a heating system for railway trains in which the steam is supplied from a turbine locomotive, the supply pipes *g*, *h* are connected to the turbine at points 1, 2, 3 at which the steam has performed a portion of its work and its pressure has been reduced to the desired value. In the arrangement shown, a three-way valve *a* operated from the driver's cab connects the steam-supply pipe *g* with the forward-driving turbine, while the steam-supply pipe *h* connects with the backward-driving turbine, both pipes *g*, *h* being fitted with automatically closing check-valves *c* so that the valve closes in the pipe not in use and prevents backflow of steam or air into the turbine. The steam passes from the pipes *g*, *h* into a valve-body *i*, to which a steam-supply pipe *d* from the driver's cab is also connected, and then by a pipe *e* to the heating-conduit *f*. If the pressure falls below the desired value, steam flows into the conduit *f* from the pipe *d* through a reducing-valve *k*. A valve in the body *i* prevents access of steam to the pipe *e* when the heating by steam is entirely cut off.

FIG.1.

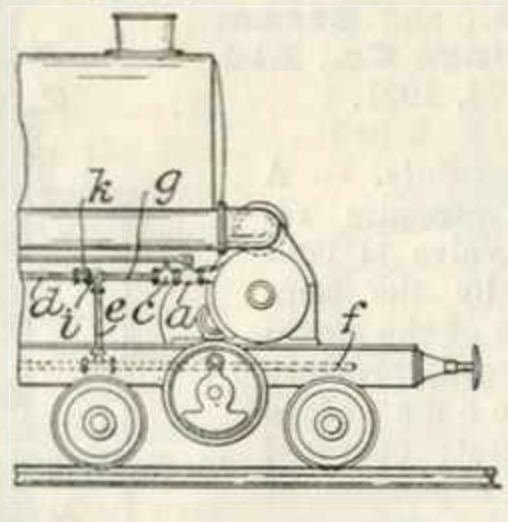
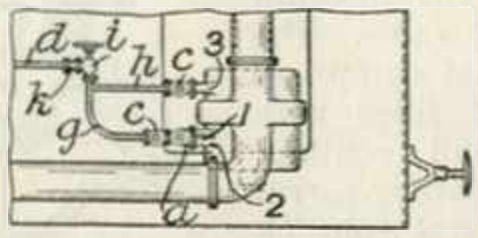


FIG.3.

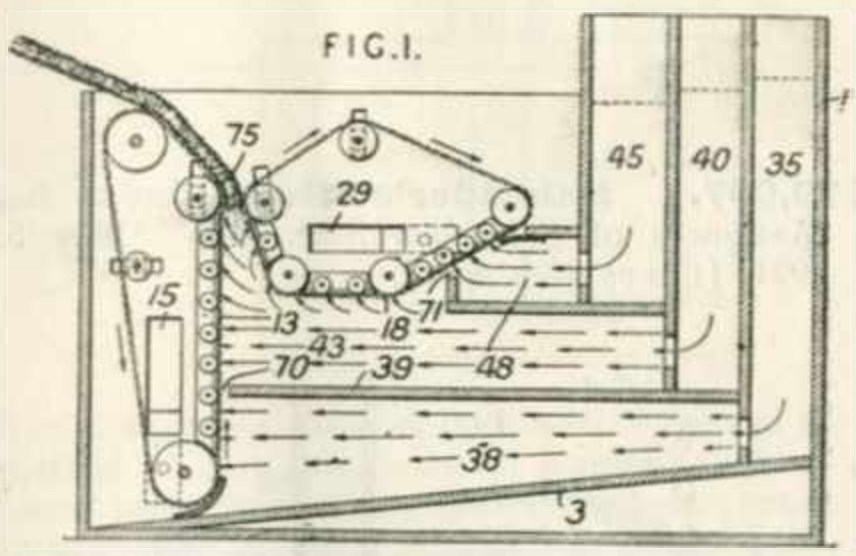


Shaw, J. K. Dec. 1, 1920.

Non-conducting coverings for heat.—Heat insulating material in the form of fibre boards is composed of different layers of fibres, the fibres in the layers and the layers themselves being interlaced with the adjacent layers. The constituent fibres 60, Fig. 5, carry protuberances 100 of natural pith to act as an entangling agent. The boards are made in apparatus comprising a tank 1, Fig. 1, and travelling foraminous belts 13, 18. A mixture of water and fibre is introduced through a channel 35 and passes out into a chamber 38, between a false bottom 3 and a partition 39. The fibres, owing to the flow of the water, separate, travel parallel with each other, and strike the belt 13 end on. The movement of the belt causes the fibres as they strike it to become curved and succeeding fibres become entangled with them. Water and fibre is also introduced through a channel 45 and such fibres adhere in a similar manner to the belt 18. A third set of fibres introduced through a channel 40 into a central chamber 43, is caused to adhere to the fibres on the belts 13, 18 as they emerge through openings 70, 71 from the chambers 38, 48. In this way three layers of fibres, which may differ in kind, are formed and are lightly compressed into a board as they emerge at 75 from between the belts. The heads of liquid in the channels 35, 40, 45 and the orifices 15, 29, through which the water escapes are adjusted to give the required flow through the apparatus and to minimize any flow from one of the chambers

FIG. 5.

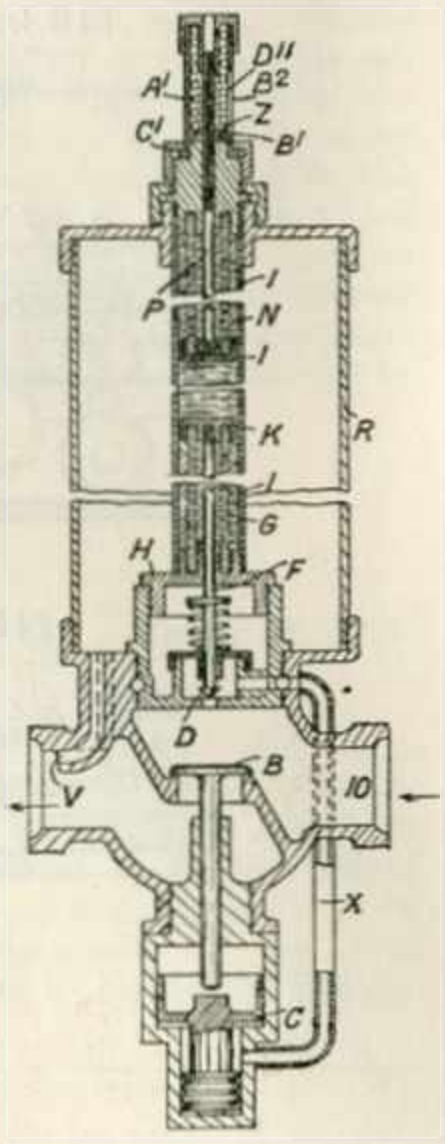
FIG. 1.



38, 43, 48 to another. More than three channels may be employed giving more than three layers of fibres in the board. Bagasse, cane, bamboo, serghum, &c. fibres treated so as to leave the natural pith on them as protuberances and beaten so as to give fibres bundles of different sizes, are employed to the extent of at least 20 per cent of the material.

179,243. Wingfield, B. R., and **Steam Fittings Co., Ltd.** Jan. 24, 1921.

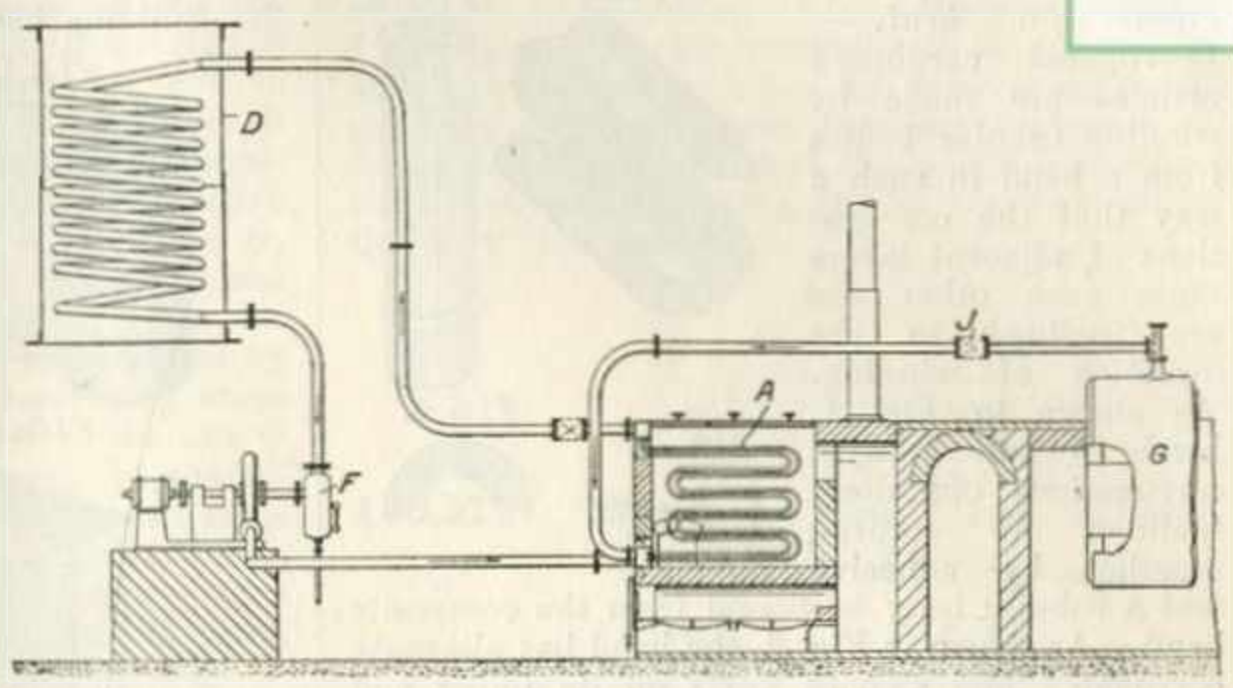
Thermostats. — A steam-pressure reducing valve is controlled by the temperature of the steam at reduced pressure by means of a thermostat, operated by the expansion of a liquid, acting on the reducing-valve through the medium of a pilot valve. The thermostat comprises a tube 1 filled with liquid and containing a spirally-corrugated metal tube G, the lower end of which is fixed to the base H, and the upper end to a cap K, carrying a rod F terminating in a



valve D, a similar corrugated tube N is arranged in the upper part of the tube 1, and its rod P carries a nut Z having a pin B^1 projecting into a slot B^2 in a fixed sleeve A^1. The nut Z is pressed downwards by a spring D^{11} and is prevented from turning relatively to the sleeve A^1. The latter may be rotated on slackening the nut C^1 in order to adjust the tube N upward or downward to vary the initial setting of the valve D. Steam flowing through the inlet 10 passes through the valve D and pipe X to operate the piston C and thus lift the main valve B to allow the steam to pass to the outlet. The reduced steam passes through the conduit V to the casing R, so that if its pressure and consequently its temperature, become too high, the thermostat is actuated and the valve D is partly closed, which results in a corresponding partial closure of the valve B. Any increase in temperature of the thermostat after the valve D is closed produces a further expansion of the liquid which is absorbed by the compression of the spring D^{11}. Specifications 26086/13 and 4190/15 are referred to.

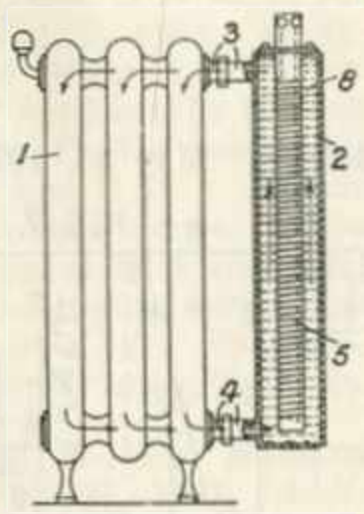
179,258. Sugden, T., and **Hall, A.** Jan. 28, 1921.

Heating by circulation of fluids.—Heat is transferred from one part of a closed circuit to another by means of superheated steam which circulates continuously from a superheater A to a point of utilization D, and is returned together with any products of condensation by means of a turbo pump F or other mechanical means to the superheater. Make-up steam is supplied from a generator G through a controlling-valve J.

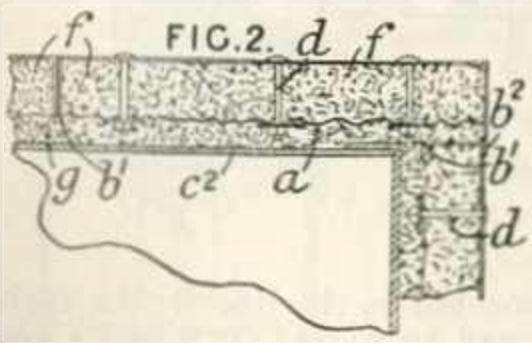


179,893. Mattei, C. de, and **Albano, E.** May 10, 1921, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*].

Radiators.—A radiator 1 is provided with a container 2 connected at the top and bottom respectively to the inlet and outlet conduits 3, 4 of the radiator and having an electric heating resistance 5 directly immersed in the circulating liquid 8. The liquid 8 consists of mineral oil or other insulating liquid of high specific gravity so as to provide a heat-accumulating body and prevent the generation of vapour.



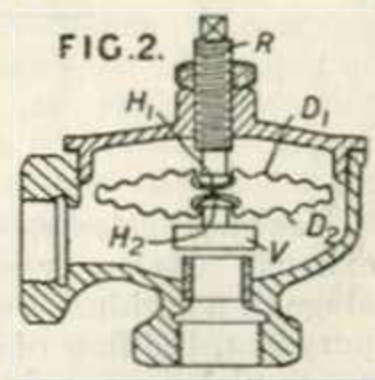
180,114. Wood, A., and **Henshilwood, A. B.** March 15, 1921.



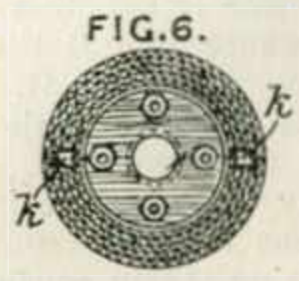
Non-conducting coverings for heat. — Non-conducting coverings for boilers and the like comprise metal shields having straight or plain flanges and containing non-conducting material *f* which projects beyond the edges b^1 of the shields so that they do not touch the heated surface c^2. A space *g* is left at the joints by cutting away part of the material *f* and is filled with non-conducting material when the slabs are placed in position. In a modification, one slab may have a projecting edge fitting under the cut-away portion of the adjacent slab. The edges b^2 of the end shields are extended to overhang the shields at right-angles to them. Expanded metal *a* for reinforcements is held in position by bolts *d*.

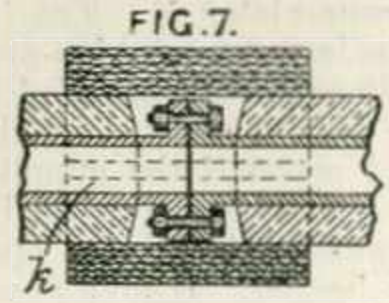
180,124. Wingfield, B. R. March 18, 1921.

Steam-traps. — In steam-traps and the like in which a valve is actuated by the expansion and contraction of a capsule containing a volatile liquid, the regulating screw R and valve V are attached by pressing or spinning each half of the capsule D_1, D_2, over the rounded heads H_1, H_2 of the screw and valve.

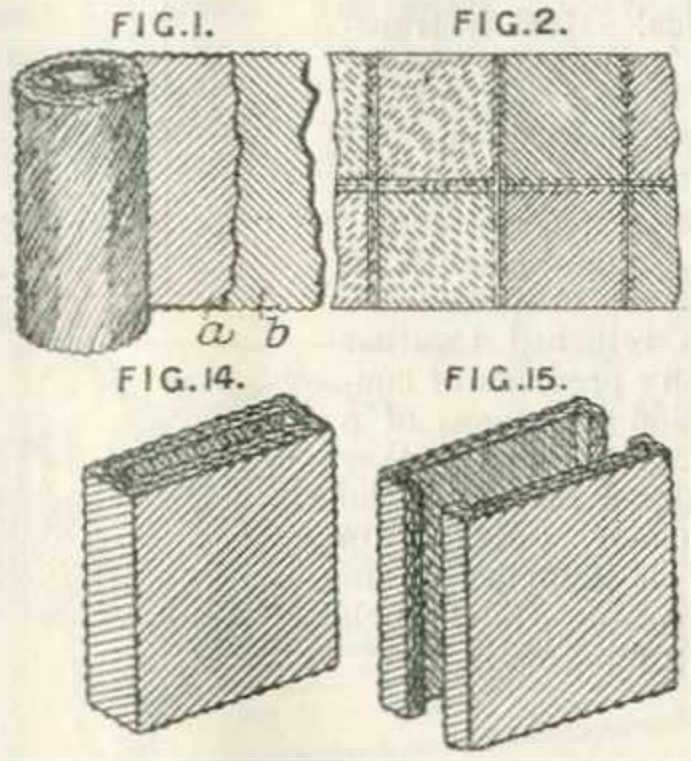


180,282. Kreher, B. Feb. 7, 1921.



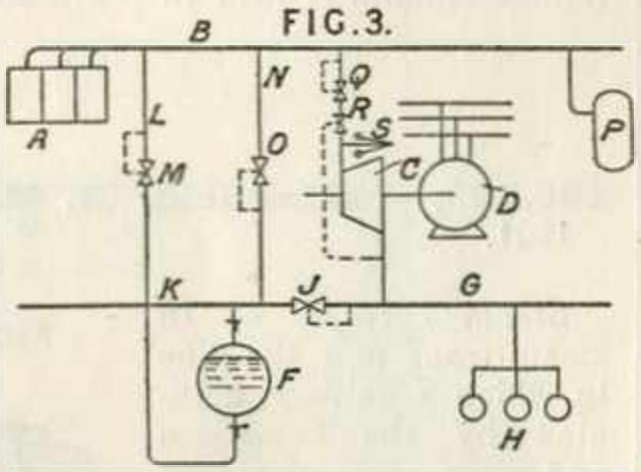


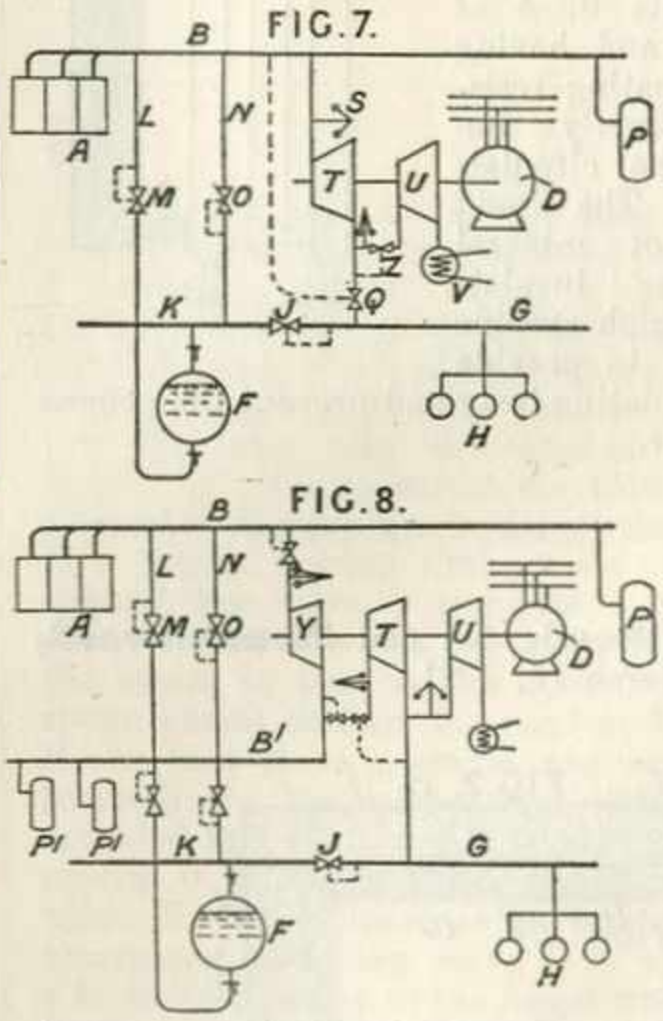
Non-conducting coverings for heat. — Corrugated cardboard articles are made by winding tubular bodies from a band in such a way that the corrugations of adjacent layers cross each other and are inclined to the direction of winding. As shown in Fig. 1, bands *a* and *b* with corrugations oppositely inclined are secured together by adhesive and a tubular body is wound from the composite band. As shown in Fig. 2, the band has alternate corrugated and smooth parts on its upper and under surfaces. To render the article impermeable an impregnating mixture of waterglass, graphite, tar, asphalt or the like may be used. Heat-insulating sleeves for conducting pipes may be constituted as shown in Figs. 3 and 4, the protection of the joint in the pipe being effected as shown in Figs. 6 and 7, by means of two sections united by double-wedge metal pieces *k*. A casing for a projectile may be formed as shown in Fig. 8. Building blocks which may be used for insulating purposes are constituted by tubular structures as shown in Fig. 14, or by sections of such structure as shown in Fig. 15.



Reference has been directed by the Comptroller to Specification 9784/99.

180,699. Aktiebolaget Vaporackumulator. May 30, 1921, [*Convention date*].

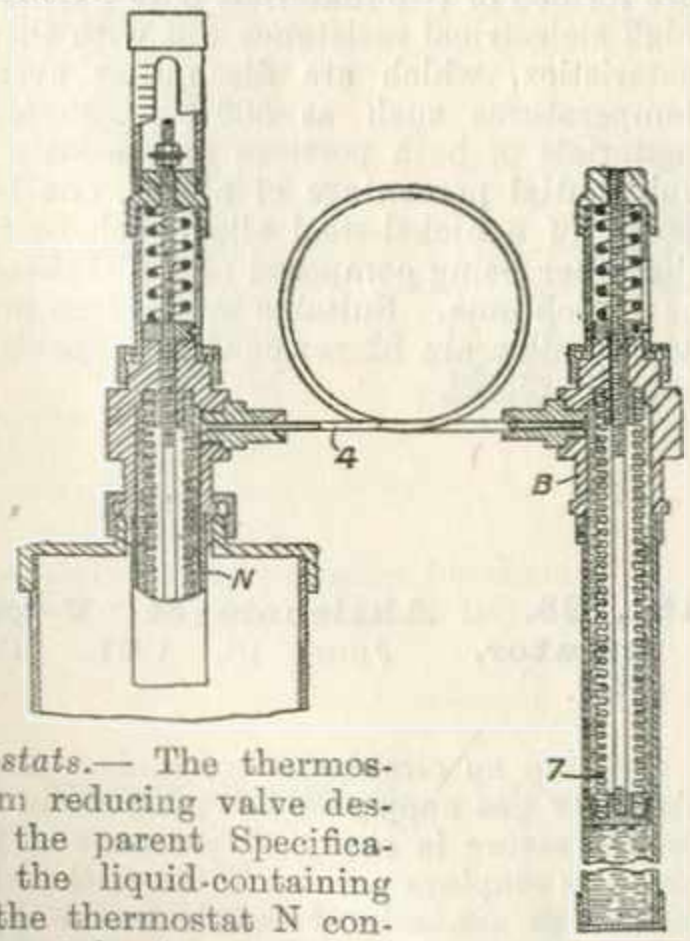




Heating systems.—In a steam plant in which exhaust steam or steam from an intermediate stage of a turbine or other motor is used for other purposes, the flow of steam being regulated by an accumulator, a reducing valve is arranged between the accumulator and the low-pressure line in order to permit expansion in the turbine to below the accumulator pressure. In the arrangement shown in Fig. 3, a non-condensing turbine C, driving a generator D, exhausts into a low pressure line G supplying paper machines &c. H. If the pressure in the line drops, a valve J opens and supplies steam from an accumulator F. The latter is supplied from the boilers A and high-pressure line B through pipe lines L, N controlled by valves M, O. The valve M is controlled by the pressure in the line B and opens if the supply pressure rises, while the valve O is controlled by the pressure in the accumulator line K and opens if the accumulator is discharged. If high-pressure steam consumers P are connected to the line B, the turbine is further governed by valves Q, R and a speed regulator S. The valve R is governed by the pressure in the line G and opens if that pressure falls. Fall of pressure in the line B is, however, prevented by the valve Q, which is governed by the pressure in the line B. The regulator S acts only at excessive speeds. In a modification the

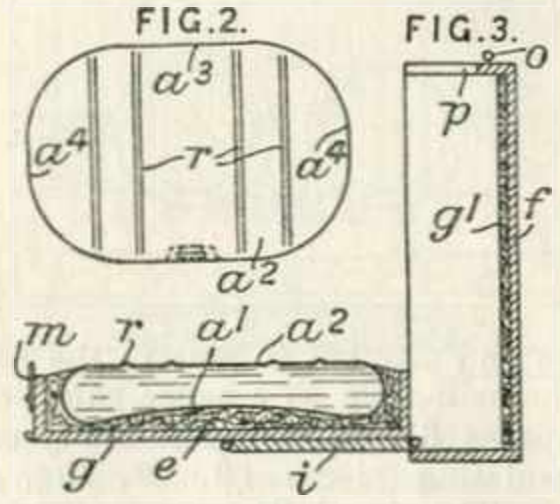
valve Q is placed between the line G and the point from which the governing steam for the valve R is taken. Fall of pressure in the line B closes the valve Q and the consequent rise in pressure of the governing steam of the valve R causes that valve to close. In another modification the valve R is dispensed with and the valve M is governed by the pressure in the line G. If that pressure falls, the valve M opens and admits steam to the accumulator F. The arrangement shown in Fig. 3 may be modified by the addition of a low-pressure condensing stage to the turbine, which is supplied from the line G under the control of a speed governor. In a modification, shown in Fig. 7, the low-pressure stage U of the turbine, exhausting into a condenser V, is supplied with steam under the control of a valve Z. If the pressure in the line G rises, the valve Z admits more steam to the stage U and the increased speed causes the governor S, operating at normal speeds, to throttle the supply to the stage T. If the pressure in the line G falls, the valve Z closes, thus admitting more of the exhaust from the stage T to the line G. The consequent reduced turbine speed causes the governor S to admit more steam to the stage T, thus further increasing the supply to the line G. Fall of pressure in the line B causes the valve Q to restrict the supply to the line G without reducing the turbine speed. Fig. 8, shows an arrangement with three turbine stages Y, T, U, in which an intermediate ine B^1 supplies the turbine stages T, U, steam consumers P^1, the accumulator line K and low-pressure line G in a manner similar to arrangements described above. The line B^1 is supplied by the exhaust from the high-pressure stage Y and from the high-pressure line B under the control of valves M. O. Specifications 135,474, 135.478 and 178,081 are referred to.

180,735. Wingfield, B. R., and **Steam Fittings Co., Ltd.** Feb. 23, 1921. *Addition to* 179,243.



Thermostats.— The thermostatic steam reducing valve described in the parent Specification has the liquid-containing space of the thermostat N connected by a tube 4 to a second similar thermostat B placed in a room, liquid substance to be heated. The corrugated member 7 is adjusted by the screwed cap at the top in such a manner that when the thermostat B approaches a predetermined maximum temperature, liquid passes into the first thermostat and closes the valve independently of the temperature in the first thermostat.

180,918. Hayn, A. von. June 22, 1921.

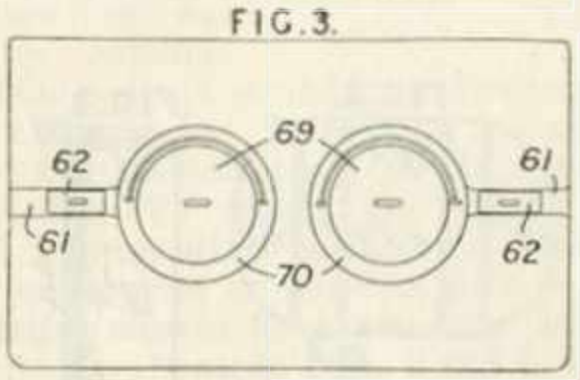


Foot-warmers; bed-warmers. — A receptacle for containing a heat-carrying medium, such as hot water, or a heat-producing medium, such as electric resistance coils, and adapted for use as a foot-warmer, an abdomen-warmer, or a bed-warmer, has one side a^1, Fig. 3, inwardly curved to fit the body and the opposite side a^2 flat and preferably strengthened by ribs r for placing the feet upon. The edges of the receptacle are curved at the ends a^4 and flat at the side a^3 as shown in Fig. 2. For convenience in carrying and for allowing the receptacle to be supported in an horizontal, inclined, or vertical position according to requirements, a container for the receptacle is provided comprising a base g having a curved insulating-cushion e of felt or like material bearing against the curved side a^1 of the receptacle, a cover f preferably lined with insulating-material g^1 and cut away at one edge p, and a connecting-plate i hinged to the base and cover. For use as an abdomen-heater, the receptacle is used alone; when the receptacle is employed as a foot-warmer the base g is arranged horizontally as shown in Fig. 3, or on top of the cover f, or in any inclined position within the cover; and when the receptacle is used as a bed-warmer the base g is arranged vertically within the cover and the user's ankles occupy the cut-away portion p of the cover. The base q may be disposed entirely within the cover f and secured by a latch m and eye o for convenience in carrying.

Sacerdote, S., and **Cristiani, S.** Feb. 15, 1921.

Heat-storing apparatus. — Relates to electric cooking-stoves of the type in which the heat generated by the current is stored in a metallic mass surrounded by heat-insulating material in which cooking-spaces are arranged. According to the invention, the cooking-spaces 65, Fig. 1, located in the upper part of the stove are provided with narrow openings 61 extending through the side wall

FIG. 3.



of the stove and adapted to receive the handle of a cooking-utensil, such as a sauce-pan, or frying-pan, the spaces 61, 65 being normally occupied by heat-insulating pieces 62, 69, Fig. 3, respectively. The insulating-cover 69 may be formed in two parts 69, 70, the inner only of

FIG. 4.

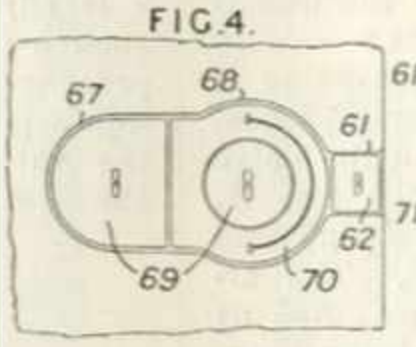
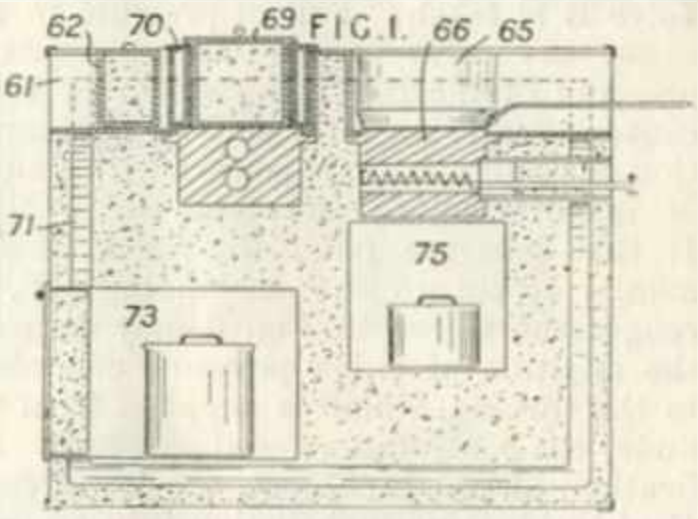


FIG. 1.



which need be removed when a small cooking-utensil is being heated. Two cooking-spaces 67, 68 may be arranged to communicate with one another as shown in Fig. 4 when it is necessary to accommodate a vessel of oblong or other unusual shape. Additional chambers 73, 75 may be disposed in the insulating material at suitable distances from the masses 66 according to the temperature required. In the arrangement shown the space 75 is located directly beneath a mass 66 to serve as an oven, while the lukewarm space 73 is located at some distance from the masses 66, and on one side adjoins the water-containing space which, in known manner, is provided to equalize the temperature.

181,080. Instone, A. J. A. March 1, 1921.

Non-conducting coverings for heat. — A non-conducting covering suitable for use in ships, buildings, refrigerator vans and the like consists of slabs A of cork or other non-conducting material faced with sheet metal C, which is affixed by means of cloth, hair or fibre B with bitumen or other adhesive material, or by adhesive material alone. The plates have overlapping joints, Fig. 1, or butt joints, Fig. 2, or they may be spaced and overlapped by arched or curved straps D^2, Fig. 3. The covering may be reinforced with cane, wood, wire, or other material arranged in the manner of the reinforcement in reinforced concrete. Specifications 4711/85, 2437/13, and 144,675, are referred to.

FIG. 1.

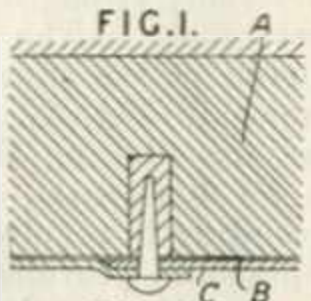


FIG. 2.

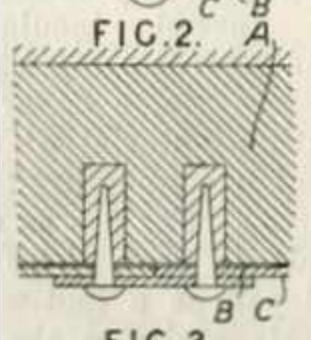
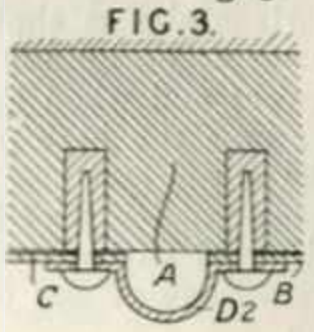


FIG. 3.



181,645. British Thomson-Houston Co., Ltd., (*General Electric Co.*). Oct. 11, 1921.

Thermostats. — Bimetallic-strip thermostatic elements, particularly those intended to be heated by the passage of an electric current therethrough, are formed of two materials both having relatively high elelectrical resistance but with thermal characteristics, which are dissimiliar even at high temperatures such as 500°F. Preferably, the materials of both portions of the strip contain a substantial percentage of nickel, one being composed of a nickel-steel alloy such as invar, and the other being composed of a nickel-copper alloy or of nichrome. Suitable proportions for a nickel-copper alloy are 82 per cent of copper and 18 per cent of nickel.

181,735. Aktiebolaget Vaporackumulator. June 18, 1921, [*Convention date*].

Heating by circulation of fluids.—A system of steam or gas supply under pressure in which the final pressure is above 57 per cent of the initial pressure employs a valve V the outlet of which is formed as a nozzle of the de Laval type. The quantity of steam or gas passing through the valve

is stated to be independent of the outlet pressure and dependent only upon the inlet pressure. In one form of valve, the closure member is provided with a cone J, which, in conjunction with the expanding outlet H, maintains the pressure at the throat about the critical pressure ratio, and the discharge as stated. The valve opening may be indicated by a graduated scale M on the spindle. The valve shown in Fig. 4 is adapted to be inserted between two pipe lines at right-

FIG.3.

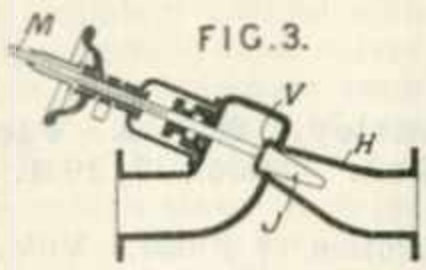
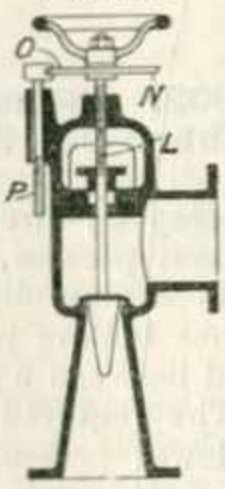


FIG.4.

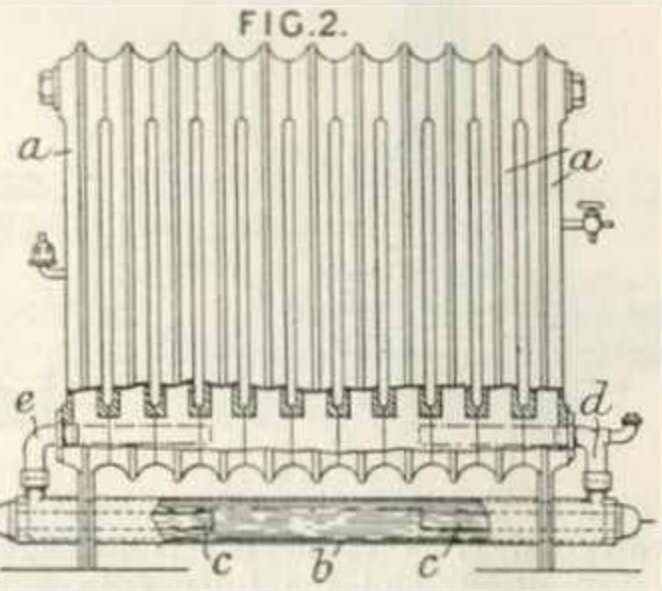


angles. The spindle L carries a disc N which rotates in a slot O in a reciprocating slide P. The disc N and slide P are both graduated so that an accurate adjustment of the valve is possible. These valves may be employed to control the supply from a common main to a series of units such as digesters, boiling vats, dryers, &c., to maintain the consumption approximately constant.

Reference has been directed by the Comptroller to Specification 5344/08, [*Class* 135, Valves &c.].

181,746. Benham & Sons, Ltd., and **Allensby, C. R.** June 20, 1921. *Addition to* 114,807.

FIG.2.

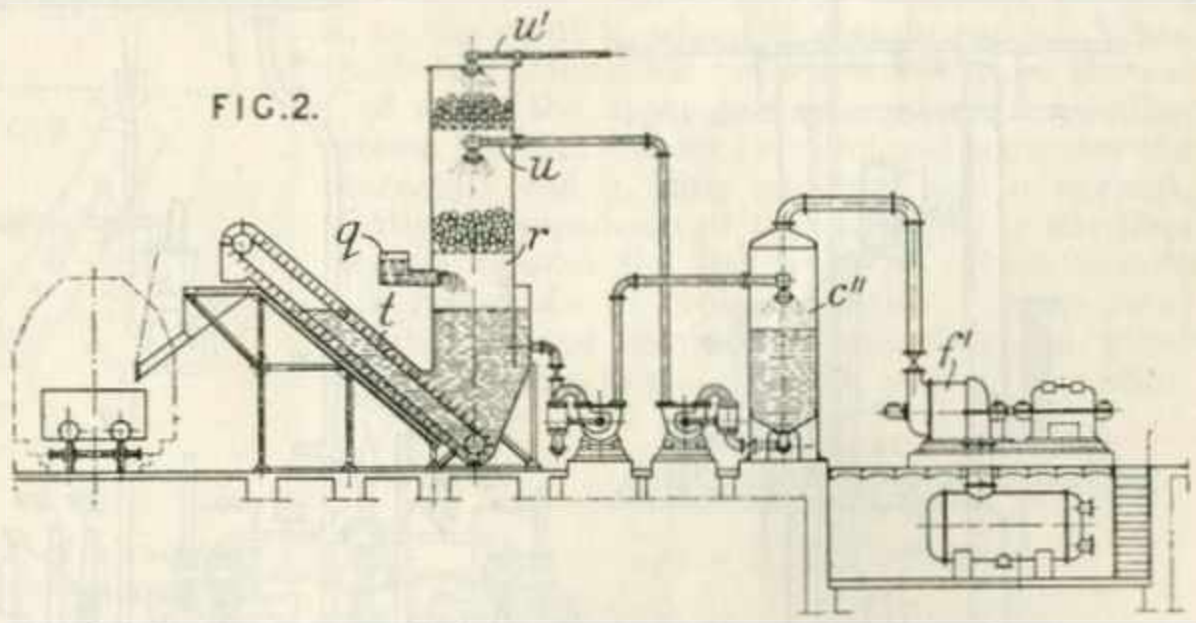


Radiators.—A steam-heated radiator *a* as described in the parent Specification is modified, by the provision of two tubes *d*, *e* connecting the boiler *b* with the ends of the lower head of the radiator, and each acting for the supply of steam and the return of water of condensation. Electric heating-elements *c* may be used.

181,787. Metallbank und Metallurgische Ges., and **Gensecke, W.** March 12, 1921.

Heating systems.—Waste heat from technical processes is transferred by direct contact to water which is then passed to a vessel in which clean steam is generated under a reduced pressure and utilized. In the example shown, molten slag is poured at *q* into water in a tank *r*. Vapours ascending are condensed by a spray introduced at *u*. The heated water is pumped to the vessel c^{11} where steam is generated under reduced pressure for driving an engine f^1, the water being returned to the spray

FIG.2.

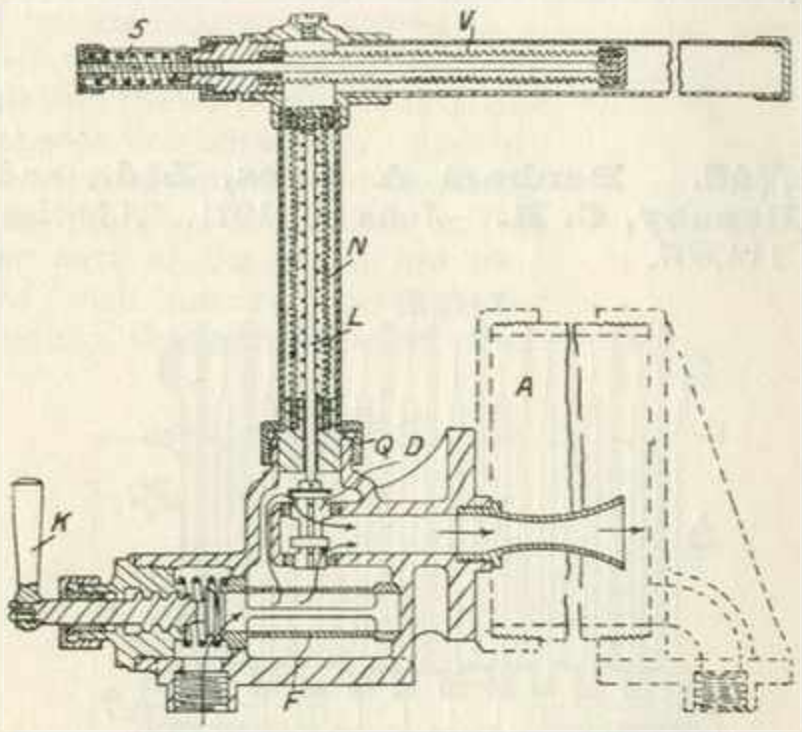


u. Make-up water enters at u^1, and granulated slag is removed by the conveyer *t*.

181,791. Wingfield, B. R. March 15. 1921.

Radiators; *thermostats.*—Relates to thermostats of the type, such as are described in Specifications 19500/10 and 10734/15, in which a valve D for controlling the admission of steam to a heater or radiator is operated by a flexible metal tube N located in a fluid-containing casing and a second corrugated tube V is provided in connec-

...h a spring 5 to adjust the initial position of the valve D and to serve as a safety device against over-expansion after the valve D is closed.



According to the invention, the tube N to which the valve-rod L is connected is arranged in a vertical position, and the tube V in a position at right-angles thereto and above the radiator A the temperature of which is being controlled, the entire thermostat being readily removable from the valve casing by loosening a nut Q and replaceable by a hand-operated valve or a closing-cap. The valve casing is also fitted with a hand-controlled steam-admission valve K and with a strainer F for preventing access of dirt to the valve.

181,802. Wheatley, R., & Victoria Rubber Co., Ltd. March 17, 1921.

Heating by circulation of fluids.—Vulcanizing cylinders, presses, &c. are heated by a liquid such as aniline oil, other than a solution, having a higher boiling point than water, which is circulated between a source of heat and the cylinder &c. The required temperature is thus obtained at a lower pressure than would be required if steam were used. The Provisional Specification mentions also nitrobenzene as a suitable liquid.

181,999. Neilson, T. July 15, 1921.

FIG.1.

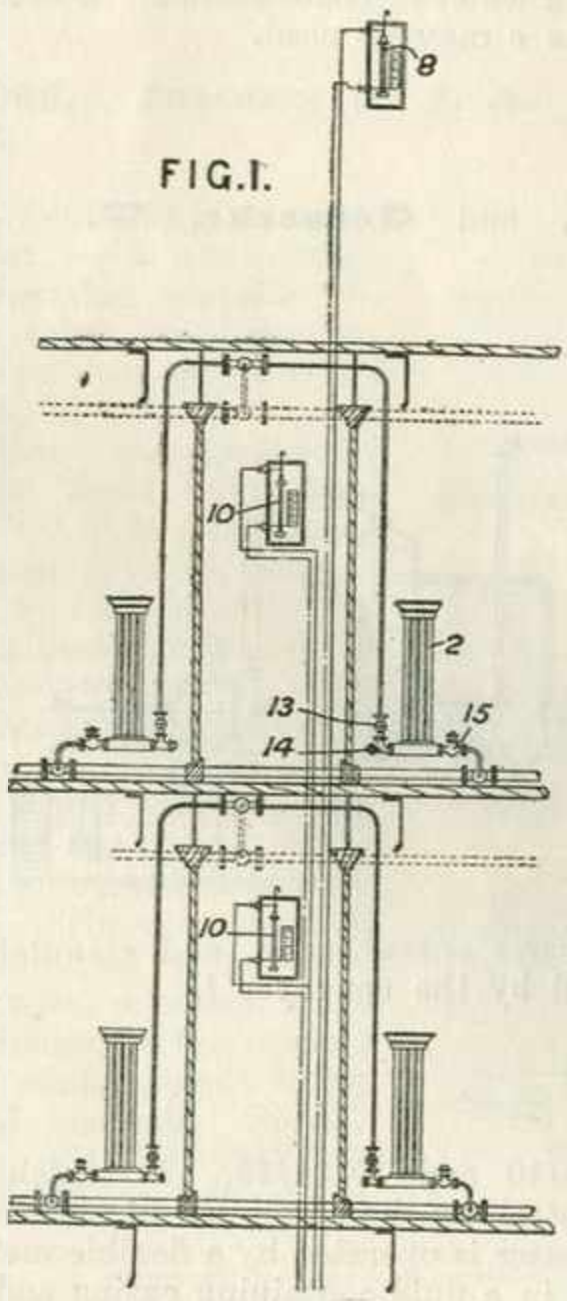
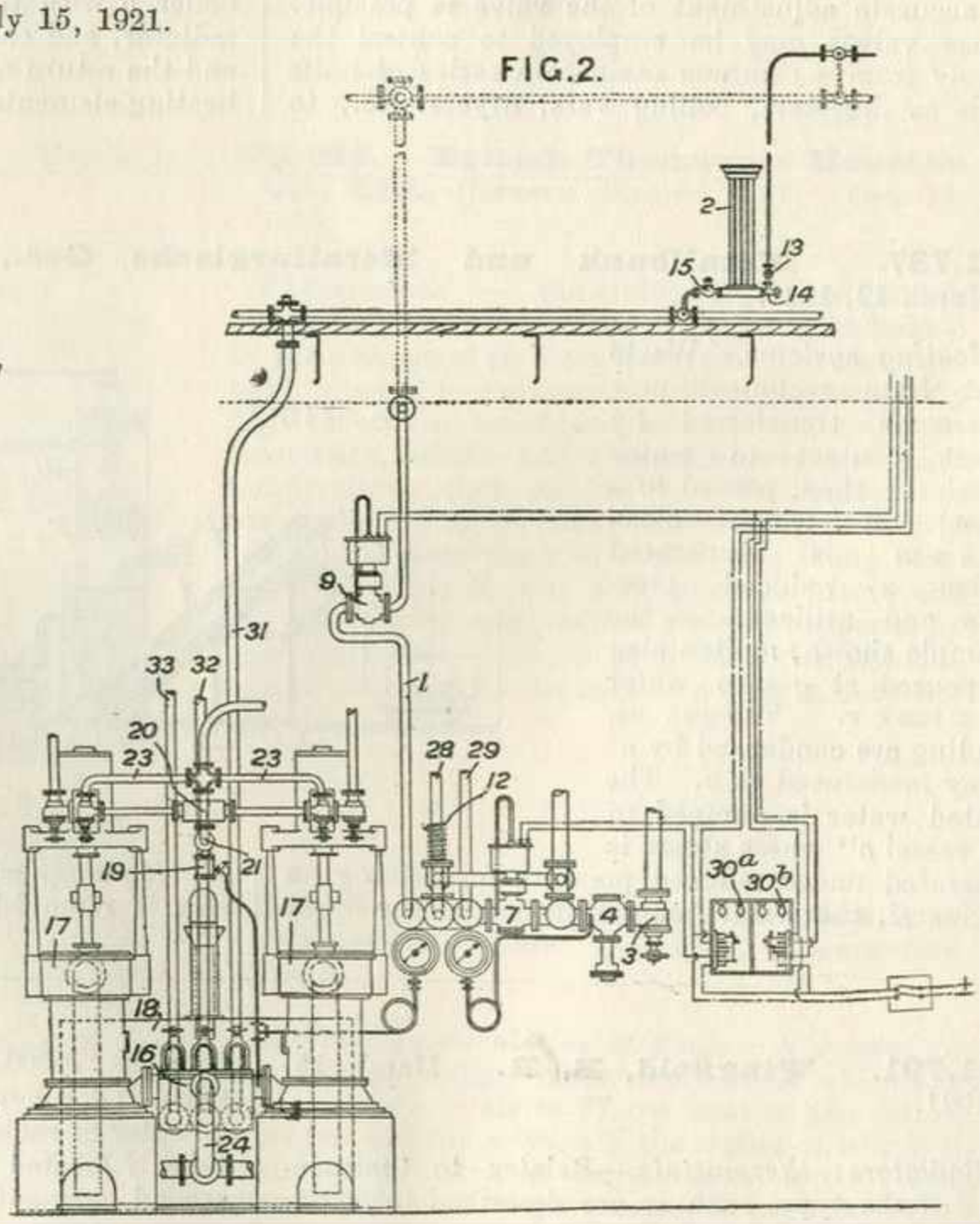
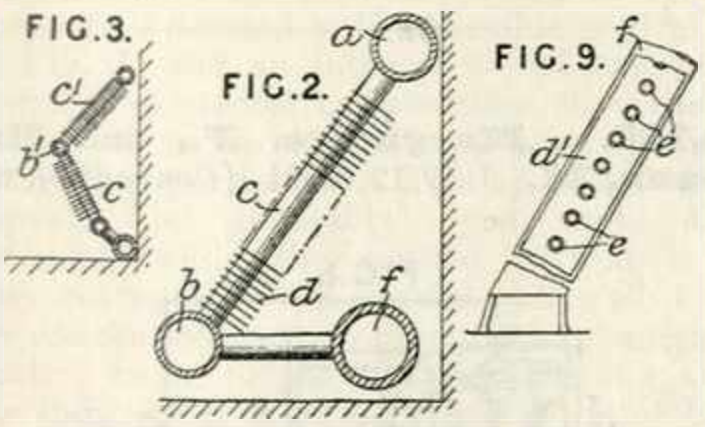


FIG.2.



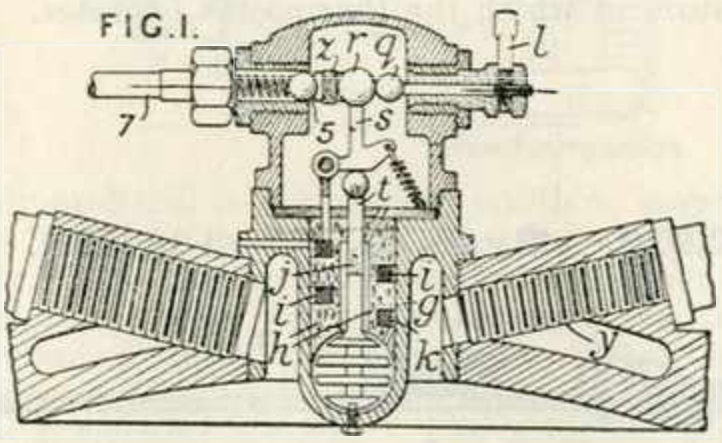
Heating ships.—A steam heating-system for ships comprises a series of supply-pipes 1, 28, 29, Fig. 2, to which steam is admitted from a high-pressure source through a main control valve 3, a reducing-valve 4 which lowers the pressure to the desired valve, and an isothermal valve 7 controlled through the medium of a thermometer 8, Fig. 1, and a relay 30^a, by the atmospheric temperature outside the apartments heated, a series of isothermal valves 9 in the supply-pipes controlled individually by relays 30^b associated with thermometers 10 in the separate apartments heated, radiators 2 fitted with hand and thermostatically operated inlet valves 13, 14 and an outlet valve 15, condensate return pipes 31, 32, 33 leading to a valve box 16, connected to the suction side of a vacuum pump 17, a valve 19 through which steam is supplied from the pipes 20 to actuate the pump and which closes automatically when a vacuum is established, pipes 21 leading to the pump from the valve 19, auxiliary pipes 23 which supply direct steam to the pump in case of a breakdown of the valve 19, a tank 18 into which the condensate is discharged, and a condensate by-pass 24 leading from the valve-box 16 to the tank 18 and fitted with a non-return valve which opens only in the event of a sudden rush of condensate to the valve-box 16. In case the reducing-valve 4 should be rendered inoperative a spring-loaded relief-valve 12 adapted to open at a predetermined pressure is connected with the system. When it is desired to utilize high-pressure steam in the system, the reducing-valve 4 is by-passed and the isothermal valve 7 rendered inoperative.

182,144. Pease, E. L. Dec. 21, 1920.



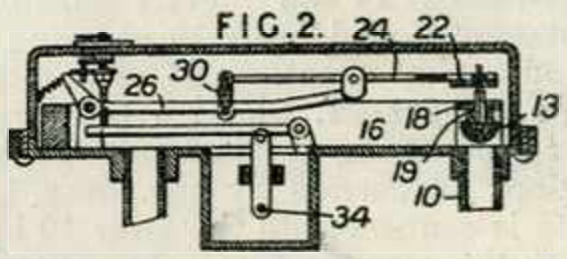
Radiators.—The tubular elements of a radiator are so supported rigidly in one or more planes inclined to the vertical that the air heated by the lower elements or lower portions of the elements does not encounter respectively the upper elements or the upper portions of the elements. Inclined tubes *c*, Fig. 3, connected to upper and lower horizontal headers *a*, *b*, have gills *d* preferably formed of thin strips of metal punched with holes nearer to one edge than the other so that a greater length of metal is exposed to the air on the supply side than on the delivery side of the elements. The lower header is connected to the steam or water main *f*. Oppositely inclined tubes *c*, c^1, Fig. 3, may be connected to an intermediate header b^1. In a modification, inclined tubes are connected to one upper header and two lower headers or to two upper headers and one lower header. In a further modification, four groups of tubes are connected to upper and lower headers and two intermediate headers. Horizontal tubes *e*, Fig. 9, are connected to inclined side headers *f* and have gills formed of metal strips d^1 arranged in vertical planes. The horizontal tubes may be of rectangular cross-section. The radiators may be arranged below the floor level of the building.

182,253. Reed, F. J., and **Reed, J. S.** April 26, 1921.



Thermostats.—An electrical heating device with a thermostatically operated switch controlling the heating current is described applied to two different forms of vaporizer. Fuel is injected by a nozzle *y* against an electrically heated bulb *g*. situated within the combustion chamber of an internal combustion engine. Current passes from the lead *l* through the arm *s* and the spiral carbon resistance *i*, embedded in insulating material *h*, to the point *k*, where it goes to earth. When the bulb *g* attains too great a temperature the rod *j*, of which the upper part is copper in expanding rotates the arm *s* about its pivot and separates the contacts *r* and *q*, thus interrupting the current. Continued expansion of the rod *j* forces the fibre block *z* against the ball valve 5, which admits compressed air to cool the device. A vaporizer external to the combustion chamber and fitted with a similar heating device is also described.

182,915. Ryan, B. April 12, 1921.

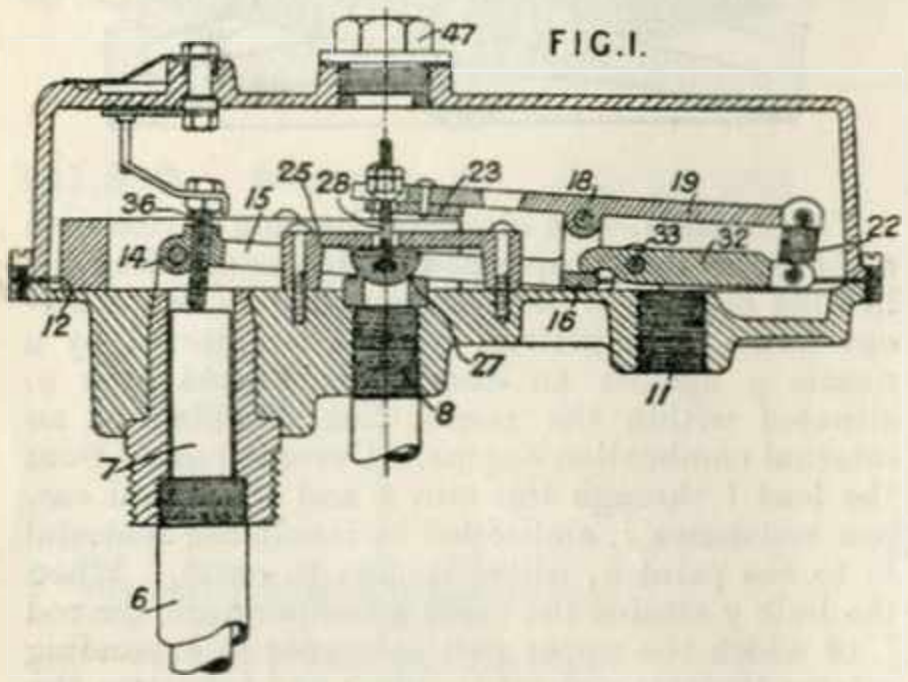


Thermostats.—Relates to heating-apparatus in which a supply of hot water in a storage tank is maintained at a constant temperature by a ther-

device which, when the temperature of the water exceeds the predetermind high point, completely shuts off the gas supply to the heater leaving on a pilot light for the ready ignition of the gas when turned on. In order to secure a quick snap-closing of the valve 13 controlling the gas supply pipe 10, the valve-lifting member is in two parts the valve-carrying part being pivoted at 24 to the part 26 operated by a suitable train of levers from the thermostat 34 connected to the spindle 34. The free end of the lever 24 is connected by means of a spring 30 to the lever 26 and the outer end carries the armature 22 of the magnet 16 a spring 19 being interposed between the head of the valve 13 a bridge-piece 18 through which the valve spindle passes. The required quick opening and closure of the valve is obtained through the action of the springs 19 and 30. A device is provided for adjusting the temperature at which the thermostat operates.

182,916. Ryan, B. April 12, 1921.

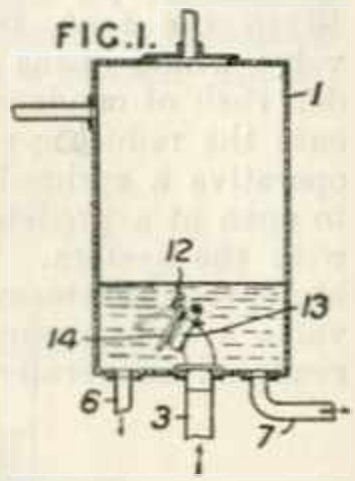
FIG.I.



Thermostats.—Relates to heating-apparatus in which a supply of hot water in a storage tank is constantly maintained at a predetermined temperature by a thermostatic device comprising a fixed magnet and a movable armature which operates to shut off completely the gas supply to the heater having only a pilot light when the temperature of the water exceeds the predetermined limit. In order to secure, *inter alia*, a quick snap closing of the valve 27 controlling the gas outlet 8 which is arranged between the actual thermostat 7 and the gas inlet 11, the leverage between the thermostat and the valve comprises a member 15 pivoted at 14 and directly controlled by the thermostat, a second lever 19 carrying the valve 27 and also the armature 23 arranged over the horseshoe magnet 12, whilst a third member 32 pivoted to the casing at 33 engages at one end the bridge-piece 16 carried by the lever 15 and the other end is connected to the lever 19 by a spring 22. With this construction, when the contraction of the thermostat tube 6 moves the rod 7 to press upwardly a screw 36 in the lever 15, the consequent upward movement of the lever 19 does not operate the valve but causes the lever 19 to swing on its pivot 18, thus putting the spring 22 into tension. This tension is accentuated by the lever 32, which is swung so that its outer end moves away from the lever 19. The tension on the spring eventually overcomes the magnetic pull upon the armature and finally the valve 27 is moved from its seat with a snap. The valve spindle 28 passes through a slot in a removable bridge piece 25 which permits access to the valve and valve seat without disturbing the adjustment of the valve a removable plug 47 being arranged above the valve. Compression springs are employed to hold temporarily the valve on its seat during transit and the casing may be made of an aluminium alloy. A device is provided for adjusting the temperature at which the thermostat operates.

183,065. Dawson, W. Sept. 1, 1921.

FIG.I.



Heating by circulation of fluids.— A hot-water system is provided with a tank 1 into which water from the boiler is delivered by the pipe 3, before passing by the pipes 6, 7 to the circulation pipes. The top of the pipe 3 is raked and a clamp 13 supports a hook 12 from which is suspended a plate 14 provided with a large hole which fits over the hook, controlling the flow of water from the boiler according to the weight of the plate and acting as a non-return valve.

183,128. Marguerre, F., and **Hausmann, M.** July 12, 1921, [*Convention date*].

FIG.I.

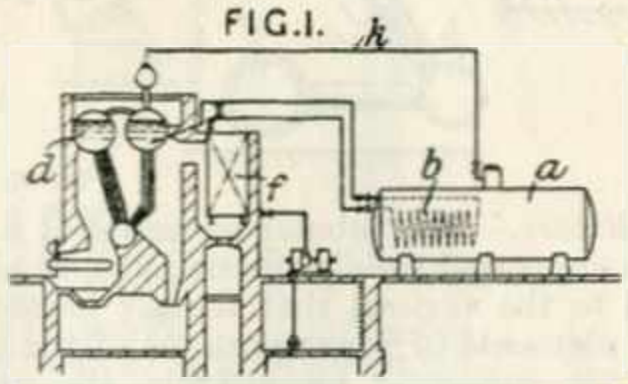
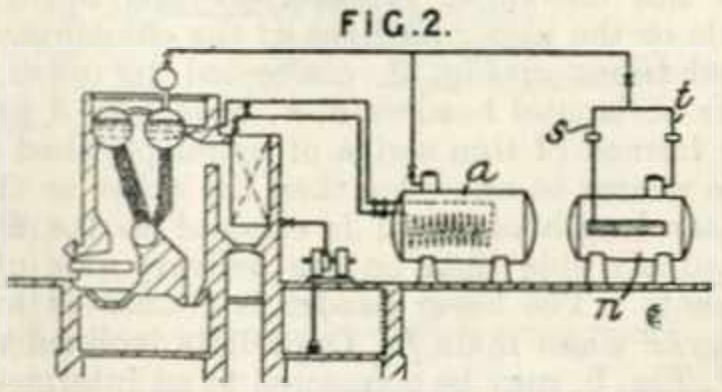


FIG.2.



Heat-storing apparatus.—In a steam-generator subjected to varying demands, excess heat is taken when the demand is low to a storage vessel by means of a steam pipe or a water-circulating pipe, and the stored heat is used when the demand is high to heat the feed-water. The heat-storage vessel *a*, Fig. 1, is charged by excess steam led from the generator *d* by a pipe *k*. The vessel contains a pipe coil *b* through which the water from the economizer *f* may be passed before entering the generator. The steam pipe may also open into an ordinary heat-storage water container *n*, Fig. 2, the two branches *s*, *t* of the pipe being fitted with non-return valves or the like, the branch *s* serving to introduce the steam into the container and the pipe *t* serving to withdraw it. The valves controlling the charging of the storers and the valves controlling the passage of water through the pipe coil may be operated by devices acted upon by the pressure or temperature of the boiler steam. Other types of storage vessels such as those containing salt solutions may be used for heating purposes instead of being returned to the generator.

183,152. Mallory, H. C. Jan. 17, 1921.

FIG. 1.

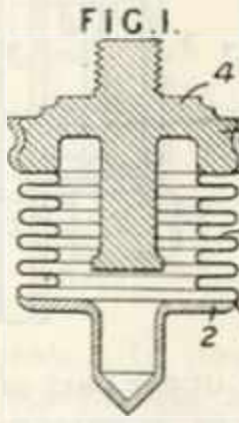
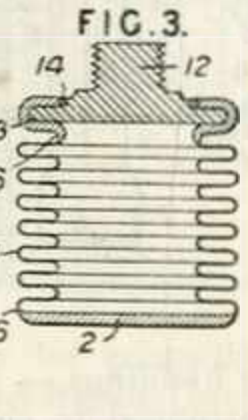


FIG. 3.



Thermostats; steam-traps.—An expansible and collapsable temperature or pressure sensitive capsule or bellows for use in controlling heating-apparatus, steam traps, feed-water regulators, the recording-arm of a thermograph, or for similar purposes is formed with a flexible central portion 7, Fig. 1, and an integral closed end portion 2 which is of greater cross-section than the central portion so as to be rigid and joins the latter by a tapering portion 16. The opposite end of the capsule is preferably open and also reinforced, while the central portion is preferably corrugated. A second end wall 4 adapted for connection to the operating-mechanism of the control valve or the like and forming a closure for the capsule is attached to the latter by pressing the thickened portion or flange 3 of the open end into grooves 9 in the end-wall 4 or, as shown in Fig. 3, by bending the flange 13 over the end wall 12. The joint may be hermetically sealed by the use of solder 14. In modifications, the closed end of the capsule may have a valve head formed integrally therewith or may be connected to the operating-mechanism of the valve.

183,162. Pease, E. L. Jan. 20, 1921.

Radiators.—A radiator for heating buildings &c. comprises a number of vertical heating-elements *a*, a^1 having secured thereto a series of sheet metal gills which are of angular or curved formation and have the portions *f* adjacent to the heating-elements horizontal, the gills forming a number of upwardly-directed narrow passages through which streams of air can flow and encounter the heating-elements and, after leaving the passages, commingle and ascend clear of the elements. In the construction shown in Fig. 2, the heating-elements are arranged in two vertical sets *a*, a^1 between headers *c*, *d* and c^1, d^1, the air entering the radiator from the outer side of each set of elements through the downwardly inclined portions f^1 of the gills and passing into the space *g* between the two sets of elements. Preferably each gill is of sufficient width to embrace all the heating-elements of a set. In a modification, Fig. 6, employing only one set of elements, the air is arranged to enter between the inclined portions f^1 of the gills from each side of the radiator and to ascend through apertures arranged in the horizontal portions *f*. In a further construction having only one set of elements, the air enters the passages by downwardly inclined portions of the gills on one side, and leaves by upwardly inclined portions of the gills on the other side. In another modification, Fig. 9, the lower portions of one set of elements are heated by gas or oil burners *i*, and one of the gills *j* is extended to form a hood or cover for the heating-space.

FIG. 2.

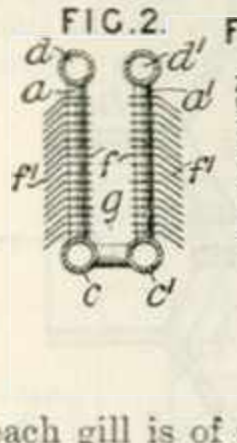


FIG. 6.

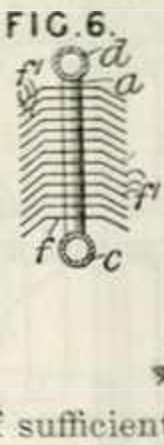
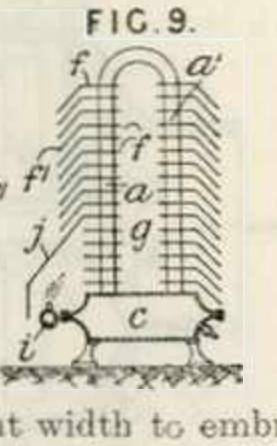


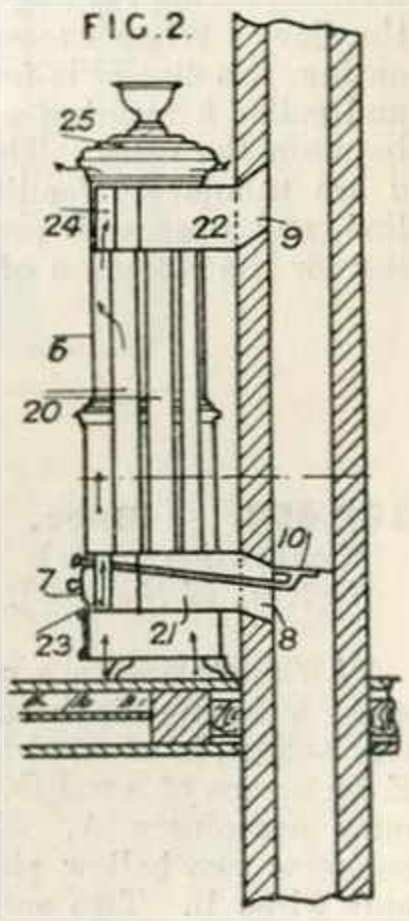
FIG. 9.



183,335. Mosel, L. G. June 17, 1921.

Heating buildings.—Apparatus for utilizing the heat of smoke and gases from chimneys for warming rooms and the like comprises an outer casing in the form of a stove, containing a series of pipes or tubes connected to the chimney by inlet and outlet passages. The smoke passes from the chimney through an opening 8 to a chamber 21, then through a series of vertical pipes to a chamber 22, finally returning to the chimney by the passage 9. A hand-operated damper 10 serves to close and open the passage 8 as desired, and the cham-

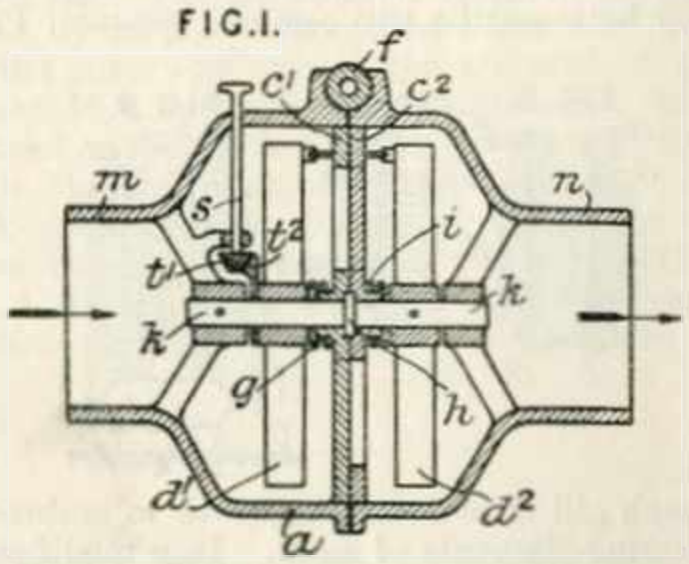
FIG. 2.



ber 21 is provided with a cleaning door 7. Air ... casing 6 through ducts 23, is warmed by passing round the pipes 20, and passes out through ducts 24 and openings in the top 25.

183,423. Ernst, W. E. July 21, 1921, [*Convention date*].

FIG. 1.



Thermostats.—The temperature of the circulating fluid in the water-cooling system of the internal-combustion engine is controlled by regulating the rate of flow of the fluid by means of a valve comprising one or more rotary slides or discs co-operating with thermostatic elements of the bimetallic strip type. In the construction shown, two ported discs c^1, c^2 are rotatably mounted on a spindle k in a casing a and adapted to be rotated in opposite directions by two thermostatic elements d^1, d^2, the initial positions of which are adjustable by means of a rotary shaft s and bevel-wheel t^1 engaging a bevel-wheel t^2 attached to the element. The discs c^1, c^2 are respectively pressed towards each other and against a collar h on the spindle k by a weak spring g acting in the direction of the flow and by a strong spring i acting opposite to the direction of the flow. When excessive pressure arises in the casing, the disc c^2 is forced away from the disc c^1 and collar h forming a free passage for the fluid between the discs. The ends m, n of the casing a are tubular to facilitate connection to a pipe line, and a recess is preferably formed in the casing for the reception of a thermometer f.

183,462. Beer, A. July 18, 1921, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].

Thermostats.—In a regulator for heating-apparatus, a double diaphragm H, containing ether or chlor-ethyl, is adapted to tilt a body B, pivoted at K by means of a rod G. The body B carries mercury containers A, wherein normally mercury connects two hollow pins M connected to the circuit wires L. Two screws E, interconnected by wires, are arranged, when the body B is tilted

FIG. 1.

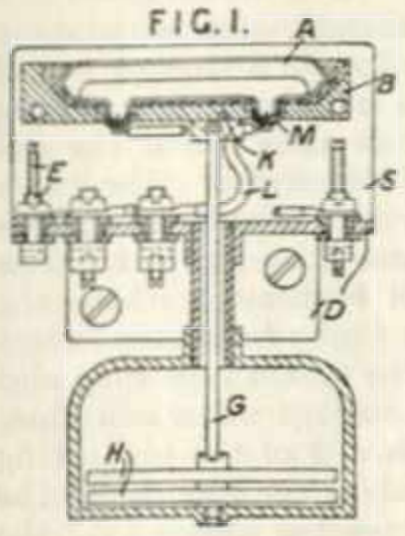
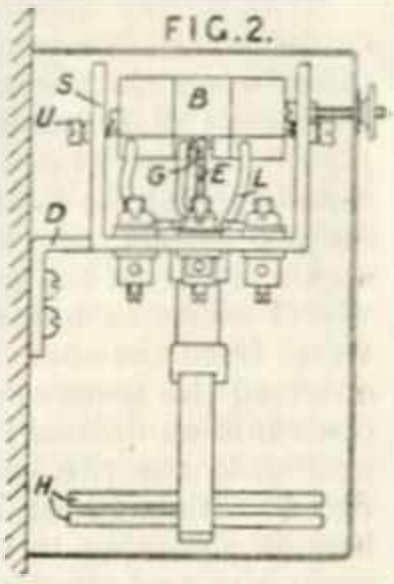


FIG. 2.



to break circuit, to give an indication of excess temperatures by contacting with the body B and closing a bell or alarm circuit.

183,706. Mosel, L. G. July 18, 1921.

FIG. 2.

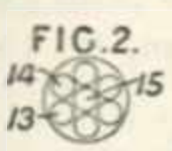


FIG. 4.

FIG. 1.

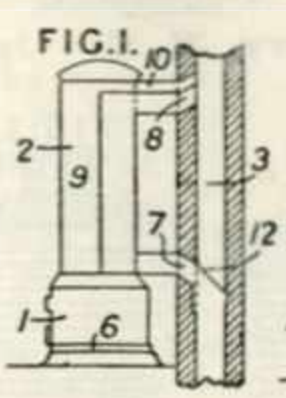
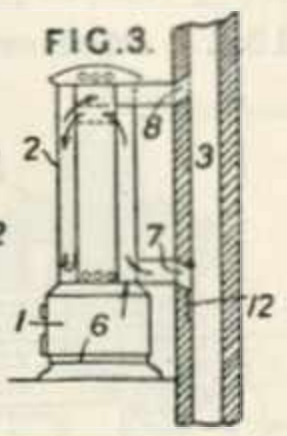


FIG. 3.



Heating buildings.— The upper part of a closed stove is arranged to serve as a passage for the smoke and combustion products from its own fire and also, by connection with the chimney, for those from another stove at a lower level. Fig. 1 shows one form comprising a base 1 with a grate 6, and an upper part 2 which is square in section. The combustion products from the stove pass through the passage 9 and pipe 10 to the chimney 3, and when the register 12 is in the position shown, smoke from the chimney is led into the stove by the passage 7, and returns to it by the pipe 8. Fig. 2 is a section of a cylindrical form, wherein the pipes 14 serve for the passage of the combustion products from the stove, the pipes 13 for the smoke from the chimney, and a central air passage 15 is provided. Figs. 3 and 4 show another construction, wherein the combustion products from the stove and the smoke from the chimney pass together through passages 16 as shown by the arrows, and in this form also a central air passage 15 is provided.

Reference has been directed by the Comptroller to Specification 1569/89.

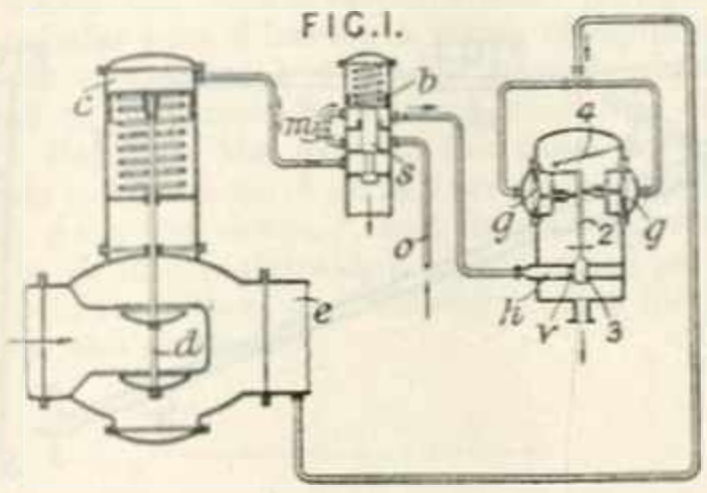
183,823. Kern, L. July 27, 1921, [*Convention date*].

Non-conducting coverings for heat and sound.— In the distillation of shale and similar materials

the shale is ground and briquetted and the briquettes are uniformly and slowly heated to at least 700° C., and, after the bitumen has been driven off, air is passed into the retort and heating continued to about 1050° C., the result being a porous product suitable for insulating purposes or as a substitute for kieselguhr. The ground shale may be mixed prior to distillation with peat, sawdust, or the like, and with substances which yield acids, such as chlorides, more particularly magnesium chloride, the acids acting on the bitumen to shorten the process.

183,840. Aktiebolaget Vaporackumulator. July 29, 1921, [*Convention date*].

FIG. 1.



Thermostats.—In devices for controlling temperatures comprising an hydraulic servo-motor controlled by a relay-actuated valve, the relay is provided with apertures through which a stream of liquid flows, a throttling member being movable, by the expansion of mercury, in front of these apertures. The apparatus shown is for operating a valve *d* so as to maintain a constant pressure in a conduit *e* and comprises a servo-motor *c*, the supply to and exhaust of liquid from the servo-motor cylinder being governed by a valve *s* carried by a piston *b*. Liquid supplied through a pipe *o* and regulating-valve *m* acts on the piston *b*, and the position of the latter is determined by the amount of liquid allowed to escape through a pipe *h* having apertures *v* controlled by a member 3 in accordance with the pressure in the conduct *e*. The apertures *v* are disposed in opposite sides of the pipe *h*, and the forked member 3 is carried by a lever 2 acted on by a spring 4 and pins carried by diaphragms *g*.

183,981. Barter, C., and **Bagley, S.** June 4, 1921.

Heating buildings.—In order to increase the water circulation in a hot water heating-system there is inserted between the supply or expansion tank *c*, Fig. 2, and the pipes *n* of the system a device which comprises an outer casing *a*, Fig. 1, and a pair of tubes *d*, *e* arranged one within the other in the casing and which permits any necessary movement of water into or out of the system and also provides an air cushion in the casing adapted to be compressed when water expands into the casing during the heating-up of the system. When the pipes *n*, boiler *j*, and radiators *k* are initially filled from the tank *c*, the water flows down the tube *d*, up through the annular space between the tubes *d*, *e*, and thence into the casing *a* through lateral apertures *f* in the tube *e*, and continues to flow until it reaches the level of a cock *i* at the lower end of the casing *a*. At this stage the flow ceases, an air cushion is formed in the casing *a*, and the tubes *d*, *e* are filled with water. When expansion of water

FIG. 2.

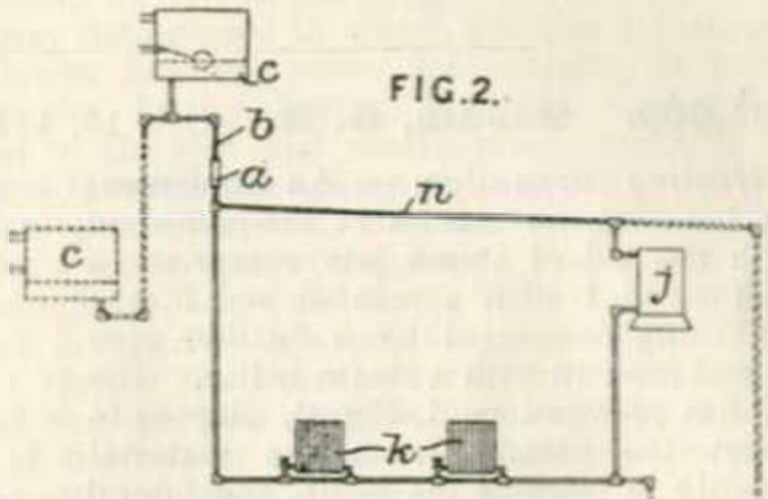


FIG. 3.

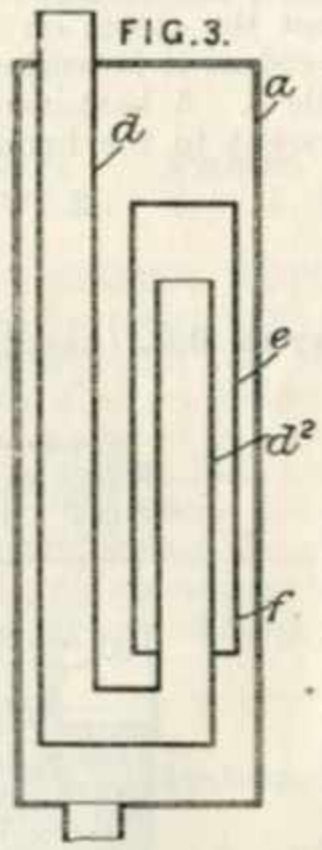
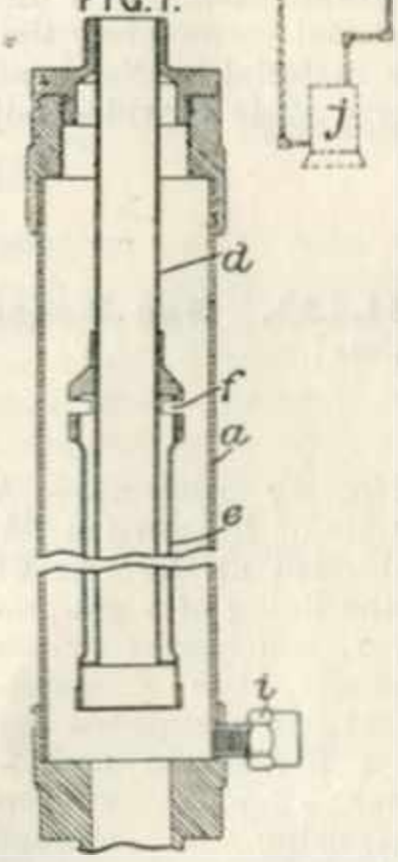
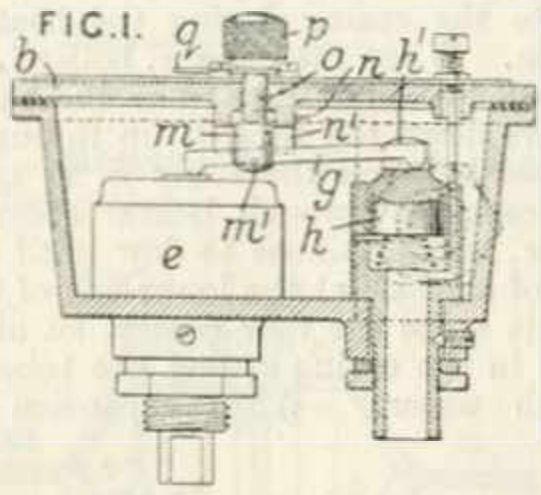


FIG. 1.



occurs from the pipes *n*, the air cushion is compressed and tends to force the water in the tubes *d*, *e* back into the tank *c*, while any water withdrawn from the system is immediately replaced by a flow from the tank. Owing to the head of water provided, the water in the system may be circulated at a temperature above the normal boiling-point. The tank *c* may, however, be located below the device *a*, as indicated in dotted lines in Fig. 2, in which case the system must be filled by other means than gravity flow. In a modification, Fig. 3, the tube *d* is of **U**-shape at its lower end, and the tube *e* surrounds the upwardly-extending limb d^2 of the tube *d*. Specification 17713/14 is referred to.

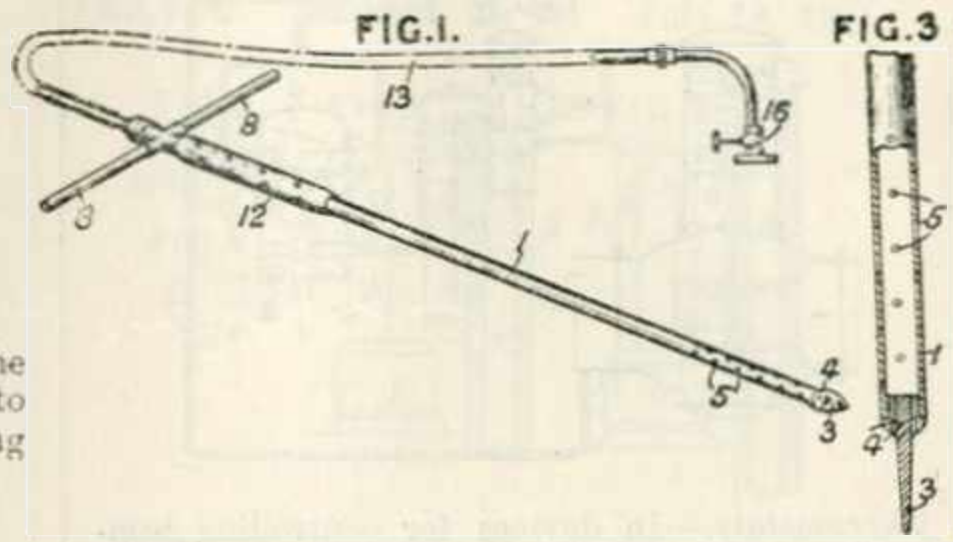
184,055. **Stimson, E. F.**, and **Stimex Gas Stove Co., Ltd.** Aug. 3, 1921.



Thermostats.— In a thermostat for regulating the gas supply to the burners of hot-water circulators or the like of the type comprising an expansion capsule *e* bearing against one end of a lever *g*, a spring-controlled gas-valve *h* operated by the other end of the lever, and a screw *o* for adjusting the initial position of the fulcrum m^1 of the lever, the screw *o* is furnished with an external finger-operated head *p*, such as a milled head, and an external pointer *q* to facilitate setting of the thermostat. The fulcrum m^1 is arranged in known manner on a plunger *m* sliding within a recess in a boss *n* on the casing or cover *b*. Angular displacement of the lever *g* due to the operation of the screw *o* is prevented by the lever engaging a notch h^1 in the head of the valve and passing across a slot n^1 in the boss *n*.

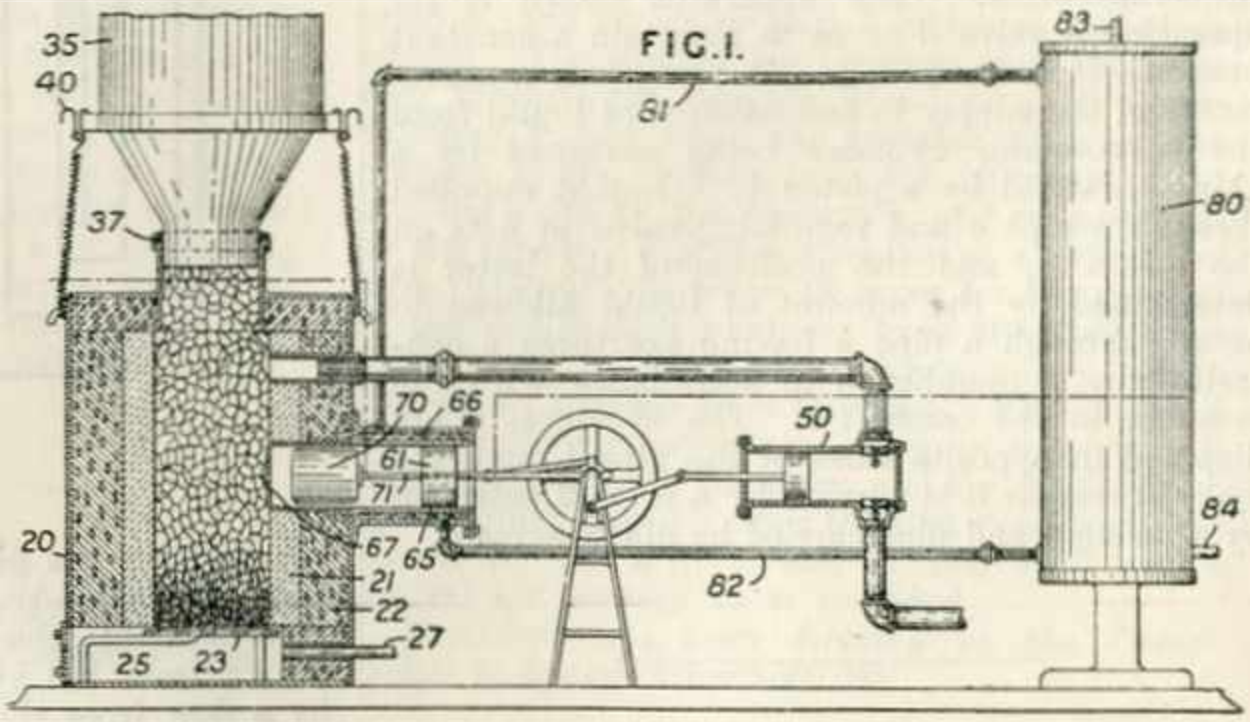
184,099. Snodin, G. R. Oct. 15, 1921.

Heating apparatus. — An implement for breaking up masses of tar-macadam with the aid of steam jets comprises a hollow rod 1 with a pointed end 3, the rod being connected by a flexible pipe 13 and cock 16 with a steam boiler. The rod has perforations 4, Fig. 3, adapted to direct the steam on to the material directly in front of the point, and lateral perforations 5 which direct the steam on to the material surrounding the rod as it is worked into the material by the handle 8. A heat-insulating sleeve 12 is provided adjacent to the handle.



184,152. Gas Research Co., (Assignees of *Smith, H. F.*). July 30, 1921, [*Convention date*].

Heating systems.— A hot-air or like engine 65, embedded at the end 67 in the lining of a gas-producer, and heated by the producer, has a water-jacket 66 connected by pipes 81, 82 to a hot-water supply system comprising a storage tank 80 having a pipe 83 for withdrawing hot water and an inlet pipe 84 for fresh water.

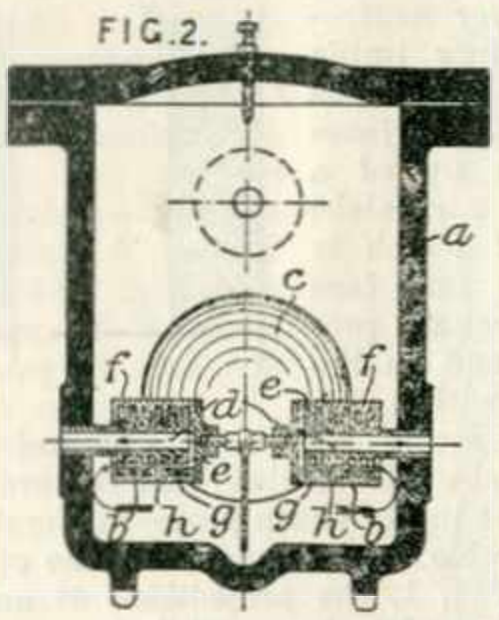


184,466. Christiani, S. Aug. 9, 1921, [*Convention date*]. *Drawings to Specification.*

Heating systems. — Heat is accumulated in granular material in a heat-insulated chamber and utilized as required by transference of the heated material to the point of use such as a cooking-oven. In the embodiment described, the granular material is heated by electric resistances arranged among it and flows, under the control of a valve, into the hollow walls of an oven from which it is discharged, under control, to a collecting chamber, to be subsequently returned to the heat-accummulating chamber.

184,752. Bloxam, A. G., (*Akt.-Ges. für Anilin-Fabrikation*). Feb. 27, 1922.

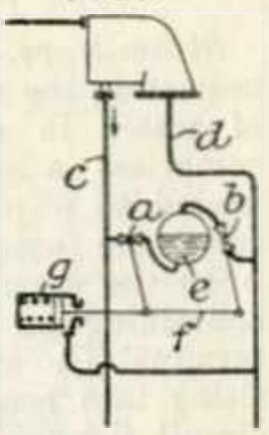
FIG.2.



Steam-traps.—A steam-trap comprises a casing *a* in which the outlet valves *b* each comprise a fixed tubular part *d* having a series of equidistant discs or ribs *e*, and a sleeve part *f* which is adapted to be turned by a lever, when the closed float *c* rises, on the axis of the fixed part, and to bring perforations *h* in a corresponding series of ribs *g* on the sleeve *f*, and extending between the ribs *e*, into registration with similar perforations *h* in the ribs *e*, and thereby form a free passage for the outflow.

184,803. Allgemeine Elektricitäts-Ges. Aug. 16, 1921, [*Convention date*].

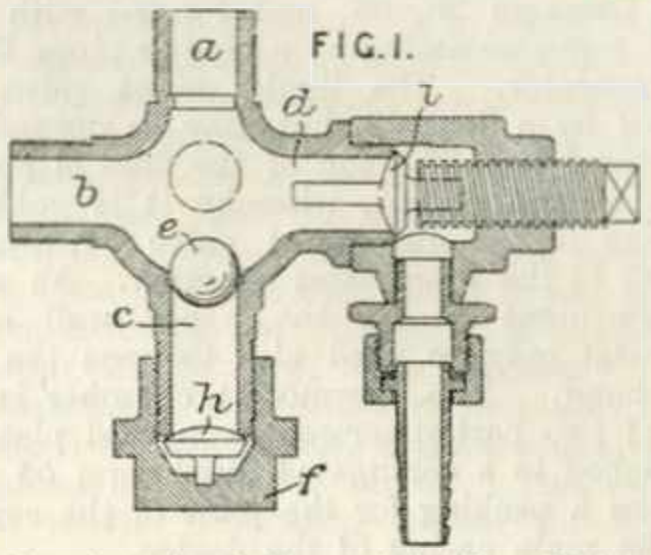
FIG.1.



Heating by circulation of fluids.—The charging and discharging valves *a*, *b* of an accumulator *c* placed in the pipes taking steam from a turbine for heating purposes are so interconnected and operated by a single controlling device that when one valve is opened the other is closed. The accumulator is charged with steam withdrawn from the turbine through a pipe *c*, and discharges into the exhaust pipe *d*. The charging and discharging valves are connected by levers and a rod *f* to a pressure-operated controlling device *g* acted upon by the pressure in the pipe *d*. The whole of the steam withdrawn may be passed through the accumulator. In a modification, the controlling device is electrically operated by means of a solenoid through which flows a current from the mains of a dynamo driven by the turbine. In a further modification, the accumulator is charged with steam withdrawn from one point of a turbine plant and discharges into a pipe withdrawing steam from another point, and the charging and discharging valves are opened and closed by interconnected pressure-operated devices, one being acted upon by the boiler steam and the other by steam withdrawn from the turbine.

184,919. Barter, C., and **Bagley, [illegible].** June 4, 1921.

FIG.1.



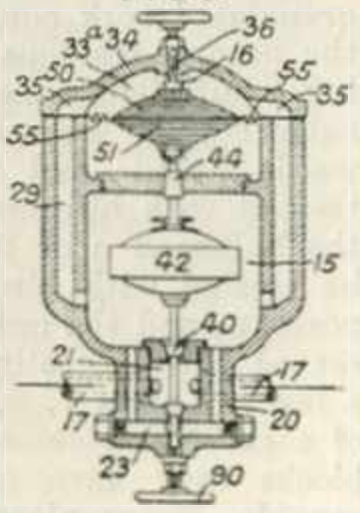
Heating by circulation of fluids.—Relates to a four-way fitting used in a high-pressure hot-water circulation heating-system for charging it with water, the fitting having branches, *a*, *b* connected to the flow and return pipes, a branch *c* adapted to receive the pump pipe, and an overflow branch *d*. According to the invention, the branch *c* has a mushroom-shaped closure piece *h* secured by a screwed cap *f*, and the overflow branch is fitted with a screw-down valve *i*. The ball *e* closing the branch *c* after charging is inserted through the overflow branch. An extension of the valve *i* prevents the ball from closing the overflow branch during charging.

185,327. Faber, O., and **Briscoe, H. V. A.** Sept. 5, 1921.

Non-conducting coverings for heat.—Heat insulation for rotary kilns such as used for calcining cement &c. is in the form of plates attached to the steel shell by screws or plugs of fusible metal which melts at a predetermined temperature. Damage to the shell by overheating is thus prevented. Thickness and/or conductivity of the insulation is varied along the length of the kiln so as to give maximum insulation consistent with preventing overheating.

185,375. Bishop, C. April 27, 1921.

FIG.1.



Thermostats.—A liquefied gas receiver for compression refrigerating machines working on the multiple-effect system is provided with a thermostatically-actuated valve controlling the flow of vapour from the receiver to the compressor. The flow of liquid to the evaporator is controlled by a float valve, or alternatively by hand. The liquid flows from the condenser through a pipe 16 into a chamber 33a above the

at 50, and thence by radial ports 35 and side passages 29 to the receiver chamber 15. The base of the casing is drilled with vertical and horizontal passages 20, 23, and formed with a recess 21 communicating by a pipe or pipes 17 with the evaporator. The liquid outlet valve 40 is actuated by a float 42, but may be opened by a hand wheel 90. The top of the float is provided with a central socket, whereby it is guided by the stem of the gas outlet valve 44, which is attached to the thermostat chamber. An adjustable abutment 36 for the upper wall of the thermostat may be used also to open the valve 44 by hand. The thermostat chamber is composed of two part-spherical corrugated plates 50, 51 attached to a corrugated diaphragm 55 which serves as a packing for the joint of the cover 34 with the main casing of the device.

185,540. Davies, J. June 18, 1921.

FIG. 3.

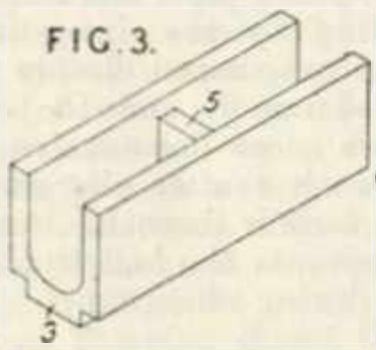
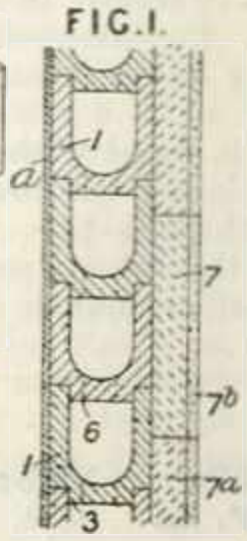


FIG. 1.



Non-conducting coverings for heat. — Heat-insulating linings of cork, particularly for cold-storage chambers on land or on ships, are built up of bricks or blocks 1 of channel or trough section open at the top and closed or partly closed at the bottom, a tongue or projection 3 being formed on the bottom of the block to fit in the top of an adjacent block. The inside faces of the block may slope throughout, the edges of the tongue also being sloped, or the upper parts of the sides may be parallel, in which case a square edged tongue is provided. The sides of the block may be connected by a stiffening-partition 5, which may project into a groove in the adjacent tongue, or may be of less height than the sides, as shown, to allow the tongue to enter the channel. The blocks may be moulded from granulated cork compressed to the desired form, the natural resinous substance in the cork forming a sufficient adhesive, or some other binding-agent may be incorporated. The blocks are afterwards baked, and the inner surfaces may be treated with bitumen. The surfaces applied to the bulkhead *a* or the wall of the chamber may be treated with bitumen before being placed in position, and the outer face of the lining may be served with a coating of cement, or covered by a layer of slabs 7, which may be compound slabs of cork 7^a and cement 7^b. The bottoms of the blocks may have apertures 6 therethrough to provide communication between the air cells. Specification 185,817 is referred to.

185,817. Davies, J. June 7, 1921.

FIG. 1.

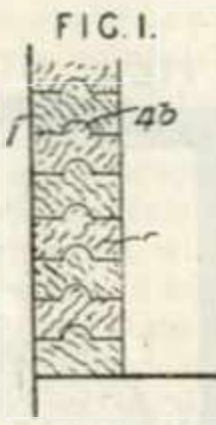
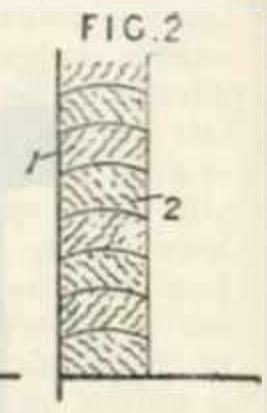


FIG. 2.



Non - conducting coverings for heat.— An insulating lining for ships' bulkheads and similar surfaces 1 is built up of a number of cork slabs 2, each of which is formed on one face with an arcuate projection 4^b and on the other face with a corresponding recess, the projections and recesses of adjacent slabs interlocking, and the arcuate shape avoiding the use of sharp projecting corners which are very liable to damage. In the construction shown in Fig. 1, the projections 4^b and recesses are of semicircular shape, while in a modification, Fig. 2, the whole of the engaging faces of the slabs are curved.

185,860. Porteous, W. K. June 15, 1921.

FIG. 1.

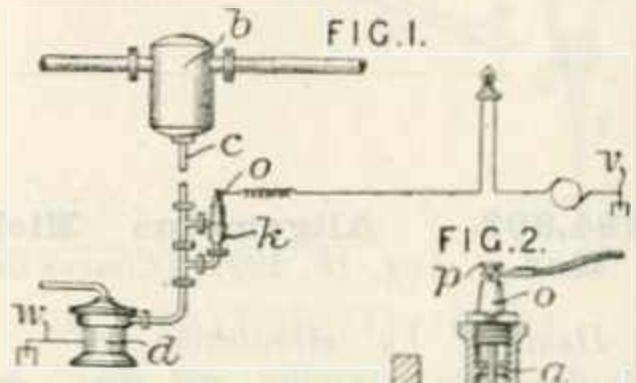
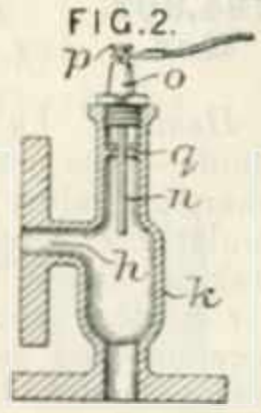


FIG. 2.

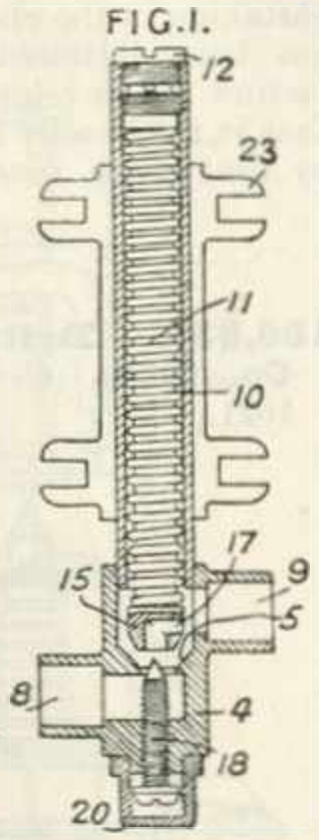


Steam-traps.—Means for indicating the abnormal rise of water in a steam-trap comprises a vessel *k* connected to a pipe *c* leading from the steam separator *b* to the steam-trap *d* and containing an insulated rod *n* connected by a terminal *p* to an electric indicating device. Water rising into contact with the rod completes the circuit through an earth return *w*, *v*. The rod *n* is held in an insulating-bush *o* and passes through an insulating disc *q*; its end is level with the top of the upper passage *h*. A second insulated-rod may replace the earth return and the vessel *k* may be attached to the steam separator instead of the pipe *c*. The rod *n* may be contained in the pipe *c* with a hood to prevent water, descending the pipe, causing premature closure of the circuit. According to the Provisional Specification the rod *n* may be bent at right-angles at its lower end to bring it into proximity with the side of the vessel *k*.

186,213. Horne, A. D. July 30, 1921.

Thermostats.—The supply of fuel to a heating-apparatus is controlled by an expansible corrugated thermostatic chamber 11 fitted at one end with a valve 15 which co-operates with a seating 5 located between the fuel inlet and outlet passages 8, 9 of an external casing 10 and has formed in it a by-pass 17, capable of regulation by an auxiliary valve or screw 18, for permitting the passage of a small quantity of fuel after the valve 15 has closed. The initial position of the chamber 11 is adjustable by means of a plug 12 screwing into the opposite end of the casing 10, and a cap 20 screwing on to a portion 4 of the casing is provided for protecting the auxiliary valve 18. The chamber 11 is preferably only partly filled with liquid, for example olive or castor oil, at normal temperatures, thus permitting a certain idle expansion of the liquid until the desired temperature is attained, whereupon a rapid closure of the valve 15 is effected. The casing 10 may be provided with lugs 23 for facilitating attachment of the device by clips to the pipes of a hot-water circulating system.

FIG.1.



186,348. Lemaistre, M. J. G. A. Sept. 26, 1921, [*Convention date*].

Heating buildings.—A hot water system is provided with a circulating device having an intermittent action and comprising an upper steam chamber 2, an intermediate chamber 2^a preferably of smaller diameter, and a lower chamber 2^b of still smaller diameter, the upper chamber being connected at its lower end to the upper part of the boiler A and the intermediate chamber 2^a being connected to the lower part. The chamber 2 is provided with a depending chamber *m*, dividing it into inner and outer chambers *p*, *q*, the chamber *p* being connected to an expansion receptacle B by way of pipes *b*, *d*. The receptacle B is open to the atmosphere. When the boiler is in operation, water circulation in the boiler and circulating device is maintained by the pipes 3^a, 3^b. Steam collects in the annular chamber *q* and ejects the water therefrom until the steam reaches the bottom of the partition *m*. It is stated that an annular seam bubble forms around the bottom of the partition and then escapes into the chamber *p* which is filled with water. This is said to result in a sudden expulsion of water and steam into the receptacle B so that the circulating device is partly emptied. Water flows from the receptacle B through the pipe *e* to the heaters R and returns therefrom through the pipe *g* to a chamber C surrounding the tubes *b*. The chamber C has a pipe connection g^1 to a water coil situated in the receptacle B and comprising annular chambers n^1, n^2 connected by vertical pipes. The water is returned to the circulating device through the

FIG.2.

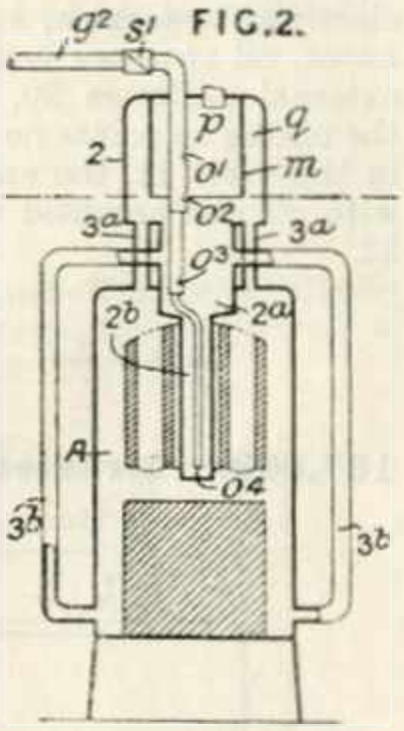
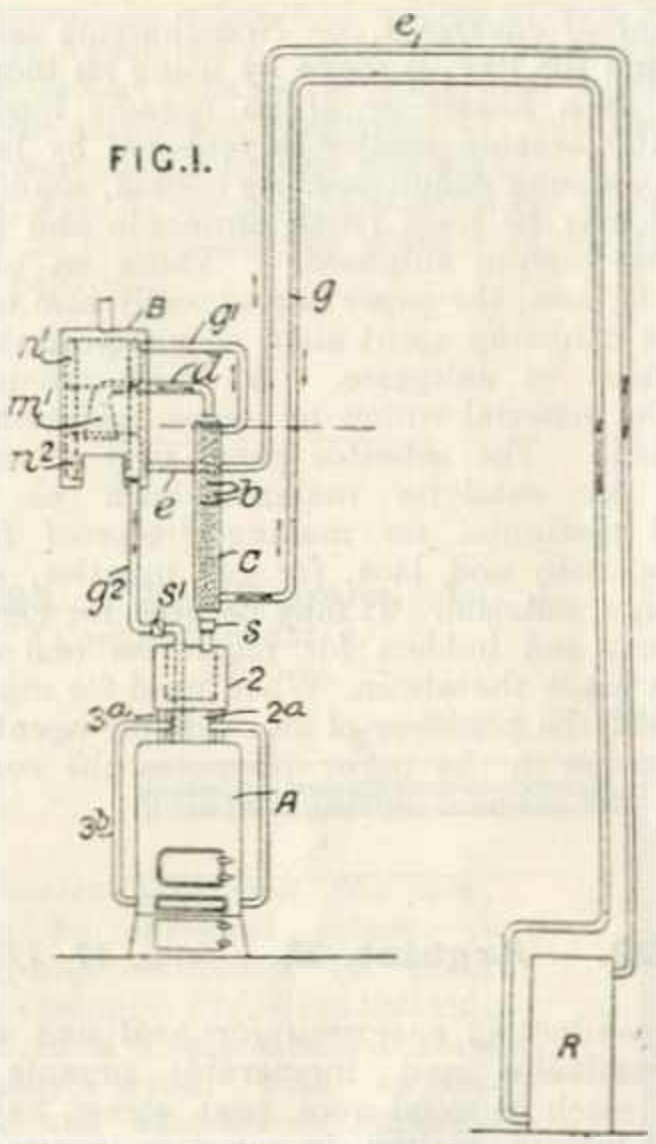


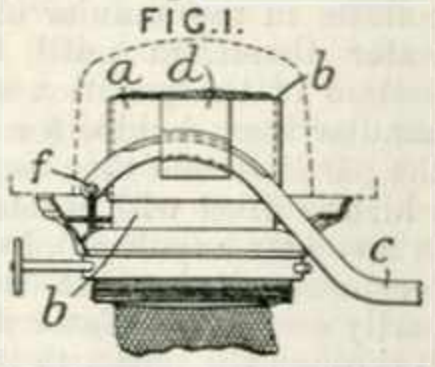
FIG.1.



pipe g^2 of varying diameter and provided with orifices o^1, o^2, o^3, o^4. A non-return ball valve *s* and a flap valve s^1 are fitted to the system, where shown. The discharge pipe *d* is provided with a bell-shaped member m^1 having apertures in the lower part thereof, the device reducing the force of ejection and preventing noise. In a modification, the chamber 2 is fitted directly on the boiler, the circulating pipes 3^b being located in the latter and the return pipe *g* passing through the bottom of the chamber 2^b to the bottom of the boiler. In a further modification, the discharge pipe *d* enters the receptacle B through the bottom thereof. In some cases the chamber 2^b may be open at the bottom to the boiler.

186,392. **Wilks, R. C.** Aug. 29, 1921.

FIG.1.



Thermostats.—In an incubator &c. the temperature is regulated by a sleeve *a* sliding on the wick-tube *b* and operated by a lever *c* pivoted at *f*, carried alongside the sleeve *a*, and connected at the opposite end to a thermostatic capsule &c. The lever *c* is curved upwardly from the pivot *f* and is formed with a knife-edge, passing through a loop or guide *d* on the sleeve *a*.

186,409. Sulzberger, N. June 24, 1921.

Fire-proof coverings. — Non-charring asbestos paper and the like, is made by using an inorganic colloid as a binder or, if an organic binder is used, the organic matter is removed by heating under oxidizing conditions. As colloid, aluminium silicate may be used (with ammonia and tannic acid), or barium sulphate. Where an organic binder is used, the paper is preferably also treated with an oxidizing agent such as nitro-cellulose or a solution of saltpetre. A small amount of catalytic material which promotes oxidation may be added. The asbestos paper may serve as a carrier for catalytic material such as finely divided platinum, for making fire-proof fabrics such as cloth and lace, for gas mantles, or for insulating material. It may be used for cigarette wrappers, and holders for cigarettes and cigars may be made therefrom. When used for cigarette wrappers, the presence of an oxidizing agent such as saltpetre in the paper promotes the combustion of the tobacco during smoking.

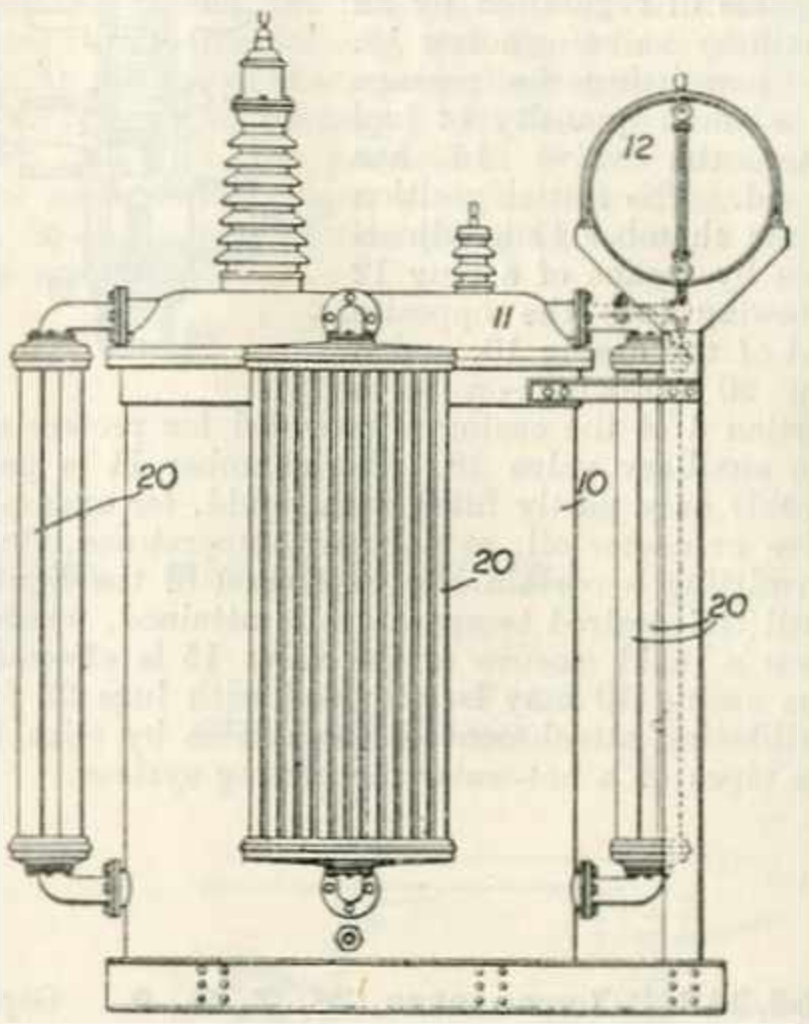
186,492. Arquint, H. Aug. 17, 1921.

Non-conducting coverings for heat and sound. — Carbonizable and incinerable organic substances, such as wood-wool, peat, straw, hay, &c. are laid loosely, plaited, in ropes or in any other form on the surface to be insulated, covered with a coating of clay, mortar, or the like, and then carbonized or incinerated by any convenient method, for example, by an embedded electric resistance, the heat developed converting the coating into the dry and solid state. The organic insulating mass may also be carbonized by heating the coating to red heat by a soldering-lamp, impregnating the mass, prior to coating it, with sulphurous or other acid.

186,617. Hirsch, Kupfer-und Messingwerke Akt.-Ges. Sept. 29, 1921, [*Convention date*].

Heating by chemical action. — A heating-cartridge containing a thermo-aluminic mixture has its casing or envelope formed of aluminium or other easily combustible metal or alloy capable of partaking in the chemical reaction when the latter has been initiated. In the process of manufacture the envelope is thinned at one portion so that it may easily be pierced by a pointed tool or by the match used for igniting the mixture.

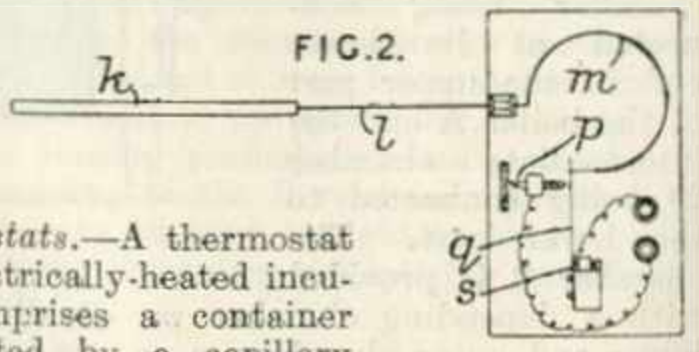
186,839. British Thomson - Houston Co., Ltd., (*General Electric Co.*). Oct. 12, 1921.



Radiators. — A casing 10 for oil-submerged electrical apparatus, such as transformers, reactances, oil switches and the like, is provided with external radiators 20, which communicate with the casing at points near the bottom and at points in the cover 11, the casing being completely filled with oil and provided with an expansion chamber 12.

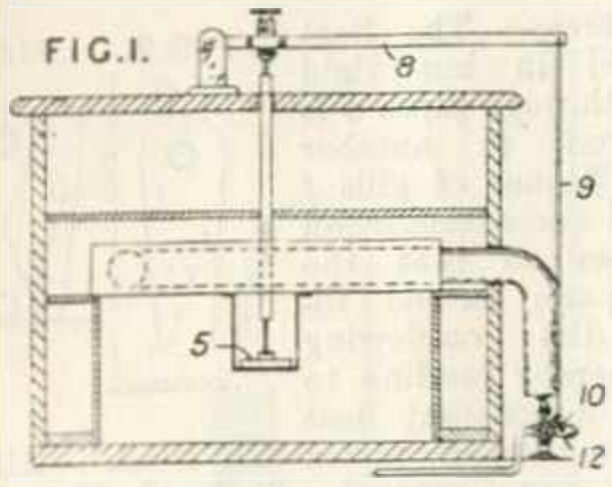
187,063. Brazier, L. G. Aug. 6, 1921.

FIG.2.

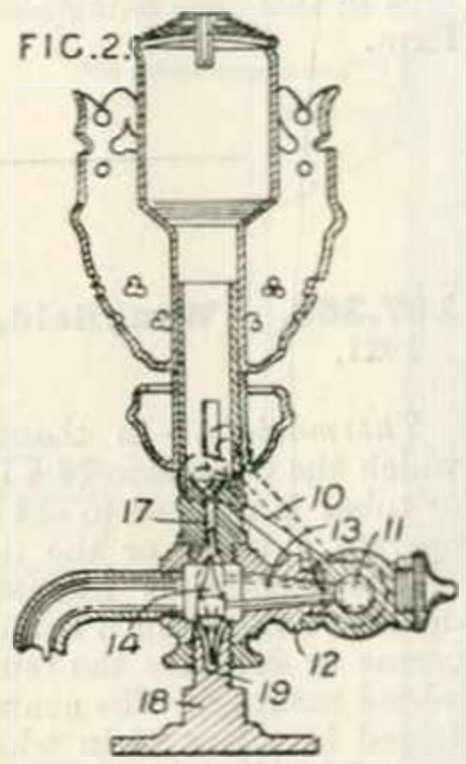


Thermostats.—A thermostat for an electrically-heated incubator comprises a container *k* connected by a capillary tube *l* to a Bourdon tube *m*, the free end of which is attached to a lever *q* which makes contact under the action of a spring *s* with an adjusting screw *p*.

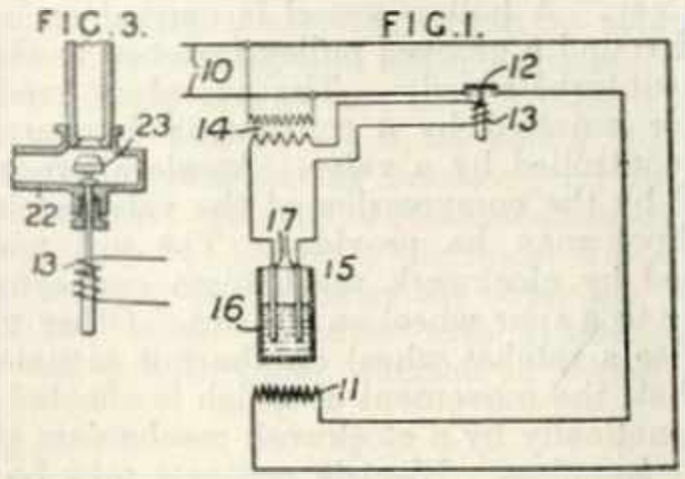
187,163. Thorpe, J. B. Dec. 14, 1921.



Thermostats.—Relates to thermostats for controlling the temperature of incubators or the like of the type in which a gas valve 14 carried by an oscillating arm 13 upon a pivot 11 rotatable in a fixed bearing is controlled through the medium of a system of levers 8, 9, 10 by an expansible capsule or like element 5 in the incubator. According to the invention, the oscillating arm 13 is movable within the bore of a branch extending from or constituting a part of the valve casing 12. The upper portion of the valve is tapered and co-operates with a correspondingly tapered seat 17, while the extent to which the valve may open is limited by an adjustable screw stop 18 having a recess 19 co-operating with the lower portion of the valve, which is preferably tapered also.

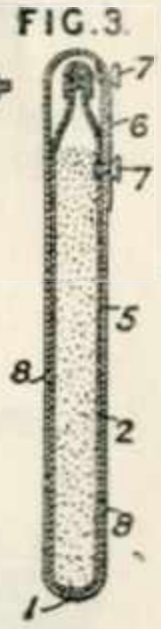


187,177. Metropolitan-Vickers Electrical Co., Ltd., (*Westinghouse Electric & Manufacturing Co.*). Feb. 22, 1922.



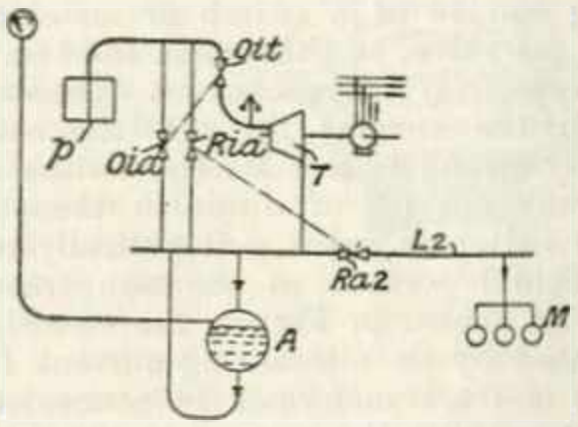
Thermostats. — The supply of current to an electric heater or of gas to a burner is controlled by means of a variable-resistance element 15 such as an electrolyte having a negative temperature coefficient which is subject to the temperature of the heating-element and is included in circuit with a source of electromotive force 14 and the actuating coil 13 of a switch or an electrically-operated gas-valve, so that when the temperature of the electrolyte reaches a predetermined maximum the current through the coil 13 is sufficiently strong to actuate the switch or valve and thereby cut off or diminish the supply of heat, the switch or valve automatically returning to its original position as the temperature falls again. As shown in Fig. 1, the electric heater 11 is heated by an alternating current from the mains 10 and a transformer 14 connected across the mains supplies the current to the coil 13 and variable-resistance element 15, the coil 13 being arranged to open a switch 12 in the main circuit at the predetermined temperature. The resistance element 15 consists of a glass or quartz container 16, preferably containing an electrolyte such as silver chloride or potassium nitrate in which are immersed electrodes 17, but the container itself may form one electrode. In a modification, Fig. 3, the coil 13 is arranged to operate a valve 23 controlling the passage of gas from a supply pipe 22.

187,183. Wertheimer, L. J. Oct. 8, 1921, [*Convention date*].



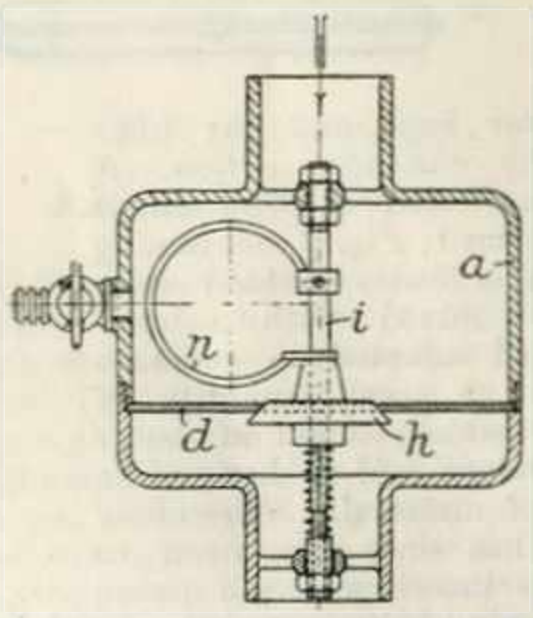
Hot-water bags and the like; heating by chemical action.—A heating-bag comprises an inner porous casing 1, Fig. 3, containing iron 2 in a finely divided state preferably mixed with sal-ammoniac and adapted to generate heat when a small quantity of water is added, and an outer pliant envelope 5 of rubber or like water-proof material. The outer envelope has one edge open to permit the insertion of the casing 1, the opening being normally closed by a flap 6 with fastenings 7, and small perforations 8 are provided in the envelope to facilitate escape of heat and evaporation of the moisture. The inner casing 1 of canvas or like material is stretched along all sides except for a short opening 3, Fig. 5, at the top, which is normally closed by a clip and serves for the introduction of the moisture when the flap 6 is opened.

187,209. Aktiebolaget Vaporackumulator. Oct. 12, 1921, [*Convention date*]. *Addition to* 129,272.



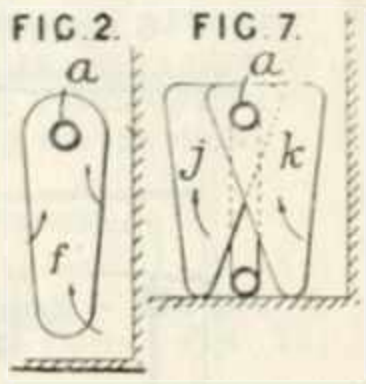
Heating by circulation of fluids.— In a plant comprising a motor T receiving steam from a boiler *p* through a valve *Oit* and exhausting into a pipe line L2 containing a steam regenerative accumulator A, the motor is the only consumer receiving steam directly from the boiler. The pipe line L2 supplies steam to a paper mill M or the like through a reducing valve *Ra*2. Steam may pass from the boiler steam pipe into the pipe line L2 through an over-flow valve *Oia*, which starts to open only when the valve *Oit* is fully open. A reducing valve *Ria* in a pipe connecting the boiler steam pipe and the pipe line L2 opens when the pressure in the pipe line drops to its lowest value.

187,234. Wartenberg, H. Oct. 14, 1921, [*Convention date*].



Thermostats.—A thermostat is included in the cooling water circuit of an internal combustion engine and comprises a spring loaded valve *h* mounted in a partition *d* in a casing *a*. A tube *n* sensitive to changes of temperature on the inlet side of the partition opens the valve as the temperature rises. The valve is guided by sliding on a rod *i*.

187,353. Pease, E. L. July 30, 1921.



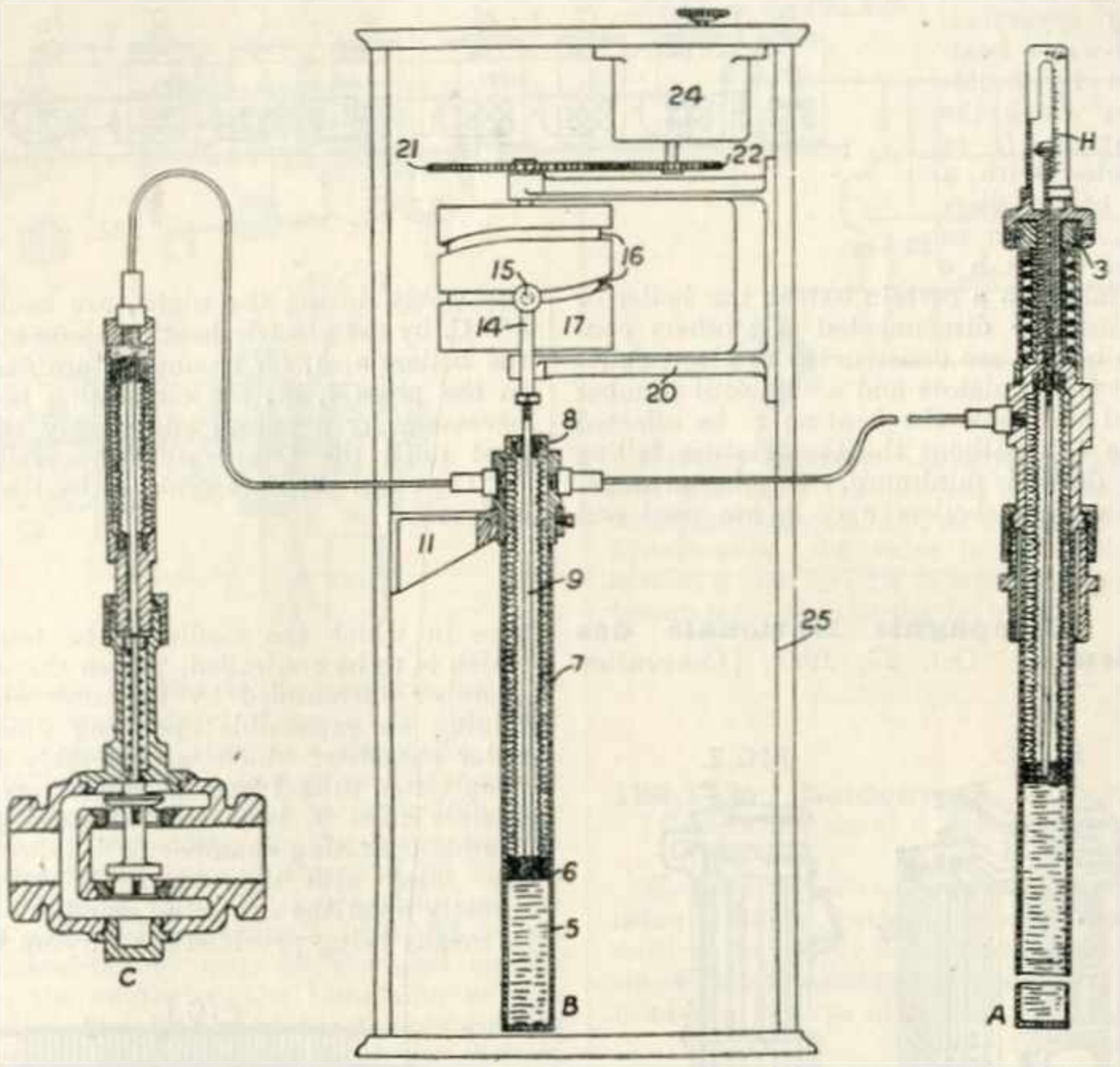
Radiators.— The heat contained in hot fluid flowing through pipes *a* is transferred to another fluid by means of gills *f* mounted eccentrically on the pipes so that the longer parts extend towards the on-flowing fluid, thereby tending to produce a constant heat difference between plates and fluid. Alternate gills *j*, *k*, Fig. 7, may be displaced side-ways the gills in this case being also shown as triangular in form.

187,369. Wingfield, B. R. Aug. 11, 1921.

Thermostats.—In thermostats of the type in which the expansion of a liquid enclosed in a tube or tubes is utilized to act on a piston and thereby operate a valve or the like, the liquid capacity of the system is increased or decreased by a definite amount in a definite time in order to increase or decrease the temperature in a predetermined manner. The controlling apparatus is contained in a box 25 in which the bracket 11 support the cylinder 5 to the cap 8 of which is attached a piston 6 by a flexible tube 7. The piston rod 9 has an adjustable extension 14 which carries a roller 15 engaging in a cam path 16 formed on a drum 17 the shaft of which is supported in bearings on a bracket 21, 22 to a clockwork mechanism 24. An electric motor with reduction gearing may be used and a cam disc with horizontal axis may replace the drum. The controller B is connected by capillary tubing to the valve operator C and the part A containing the regulator head and safety device 3 the starting temperature being set on the scale H. The part A may be dispensed with, in which case a temperature scale is mounted at the side of the drum. In a modification the free end of the piston-rod is provided with a screw thread carrying a nut bearing on balls or rollers situated in grooves in the nut and container cap. A hollow vessel is carried on a cord wound round a grooved pulley fastened to the nut and counterbalanced. The vessel is gradually filled or emptied by a continuous drip arrangement controlled by a valve. Acceleration is prevented by the compression of the valve spring or a dashpot may be provided. The nut may be operated by clockwork mechanism connected by gearing to a spur wheel on the nut. Other means comprise a ratchet wheel on the nut actuated by a ratchet, the movement of which is effected electromagnetically by a clockwork mechanism giving electric impulses. Electric contacts may be used in connection with the apparatus to give alarms at certain temperatures.

(*For Figure see next page.*)

187,369.



187,408. Whatmough, J. W., and **Whatmough, H.** Sept. 5, 1921.

Non-conducting coverings for heat. — A removable non-conducting covering for the heated surfaces of machinery and the like comprises a composition of asbestos and sodium silicate moulded to fit the surface, and a covering of canvas attached by a paste of china clay and sodium silicate. The cover 2 is shown applied to the top buck 1 of a garment press. Holes 3 - - 6, recesses 8, 10, and a gap 9 are provided during moulding for the reception of screws and the accommodation of the projecting parts 11, 12, 13 of the buck. The holes and recesses may be cut after the cover has been moulded and dried. A cover with a hard outer surface and a soft inner surface in which the projections embed themselves is formed by moulding two masses with solutions of silicate of soda of different strengths.

FIG. 3.

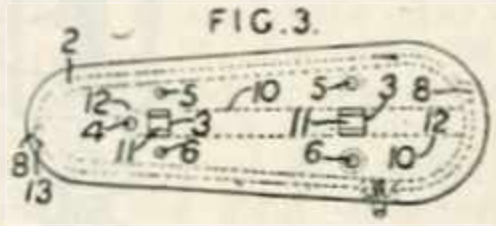
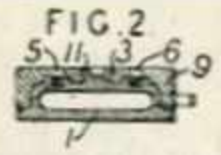


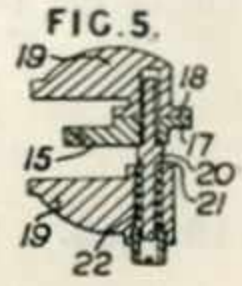
FIG. 2



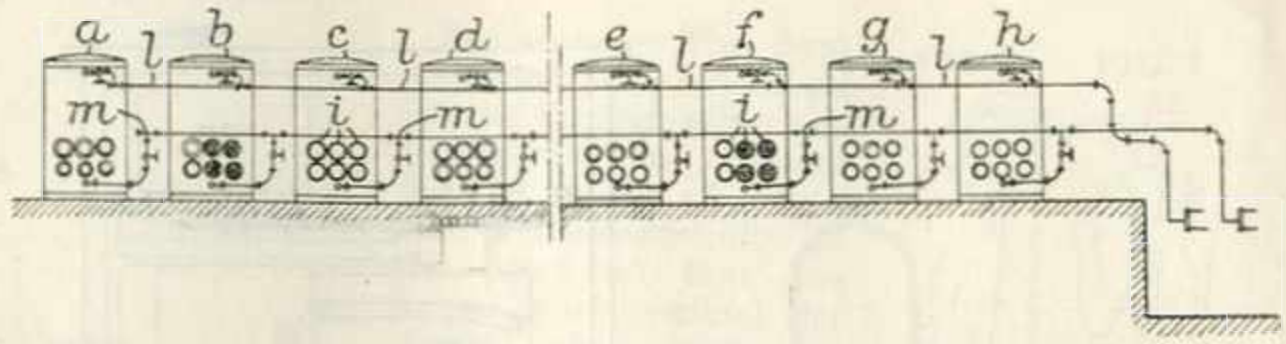
187,452. Still & Sons, Ltd., W. M., and **Still, E. H.** Oct. 25, 1921.

Thermostats. — The bell crank lever 15, transmitting the movements of a capsule to a make and break in the circuit of an electric heating device, is provided with a disc-like facing 17 engaging a corresponding facing 18, upon the casing 19 against which it is pressed by a spring 22 bearing against a shoulder 21 on the spindle 20. Friction thus set up prevents the apparatus from being over-sensitive. Specification 171,181 is referred to.

FIG. 5.



187,533. Winkler, C. Feb. 6, 1922.



Heating buildings: heat-storing apparatus.—In a hot-water heating system for buildings &c. in which the circulating-pipes *l*, *m* are connected with a number of boilers *a* - - *h* and, as soon as temperature of the water has fallen to a certain extent the boiler or boilers in use are disconnected and others connected, the boilers are constructed as electrically-heated heat accumulators and a sufficient number is employed to enable the heating to be effected for a whole day without the temperature falling below the desired minimum. In the arrangement shown, eight boilers *a* - - *h* are used and preferably during the night, are heated to about 90° C. by the electric heating elements *i*. In use, the boilers *a*, *b*, for examples, are first connected to the pipes *l*, *m*, the circulation being aided if necessary by a pump, and supply the necessary heat until the temperature has fallen, say, to 40° C., when they are replaced by the boilers *c*, *d* and so on.

187,940. Compagnie Nationale des Radiateurs. Oct. 25, 1921, [*Convention date*].

FIG.1.

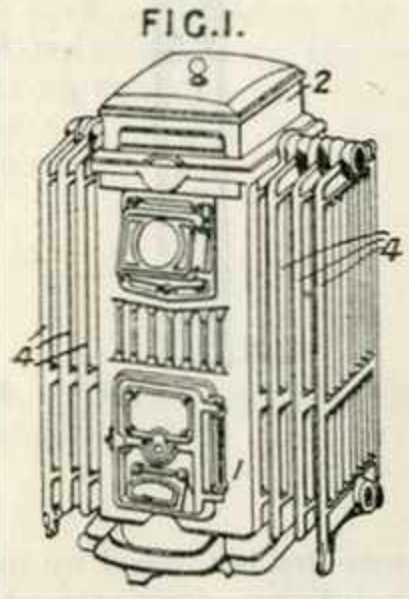
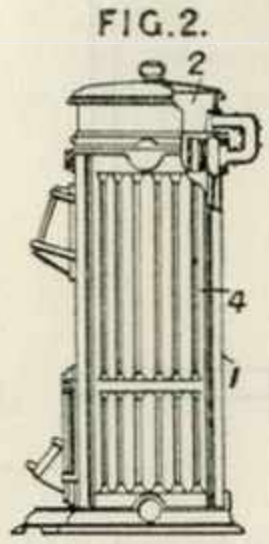


FIG.2.

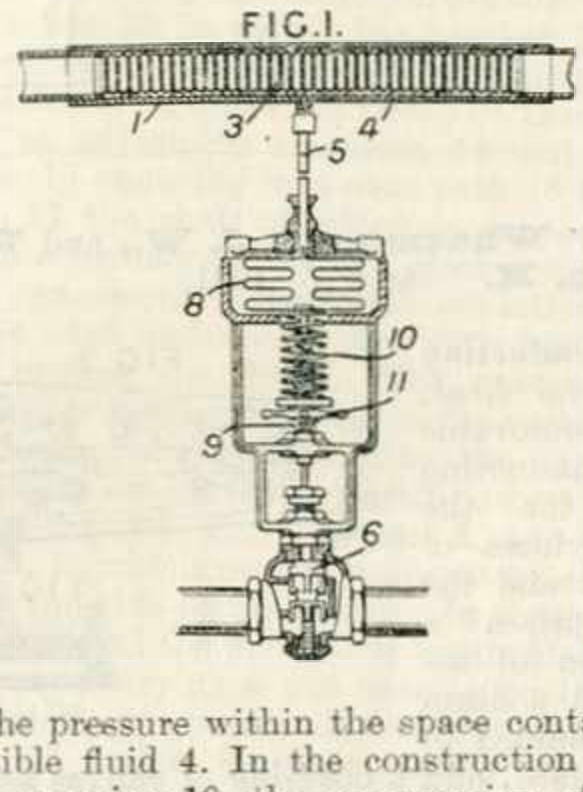


Radiators.—A hot-water radiator stove having hollow water-containing walls 1 is provided with an expansion chamber 2 forming the top of the stove and resting on the upper ends of the walls. The boiler is preferably composed of four cast-iron plates each comprising main passages at top and bottom connected by a plurality of vertical ducts, as described in Specification 14005/11, [*Class* 126, Stoves &c.].

188,062. Wells, H. J. C. July 29, 1921.

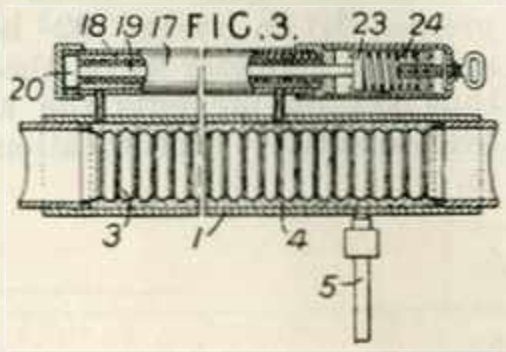
Thermostats.—Relates to temperature - regulating apparatus for use in connection with heating or cooling systems, for examples the water-cooling systems of internal - combustion engines of the type in which the medium, the temperature of which is to be controlled, passes through an inner chamber surrounded by an outer chamber containing an expansible operating fluid. The annular chamber, which is preferably formed of a plain outer tube 1 and an inner corrugated non-flexible tube 3, is connected by a pipe 5 to a flexible operating chamber or bellows 8, which is also filled with the expansible fluid, and acts directly upon the operating spindle 9 of the valve 6, means being provided for varying the capacity

FIG.1.

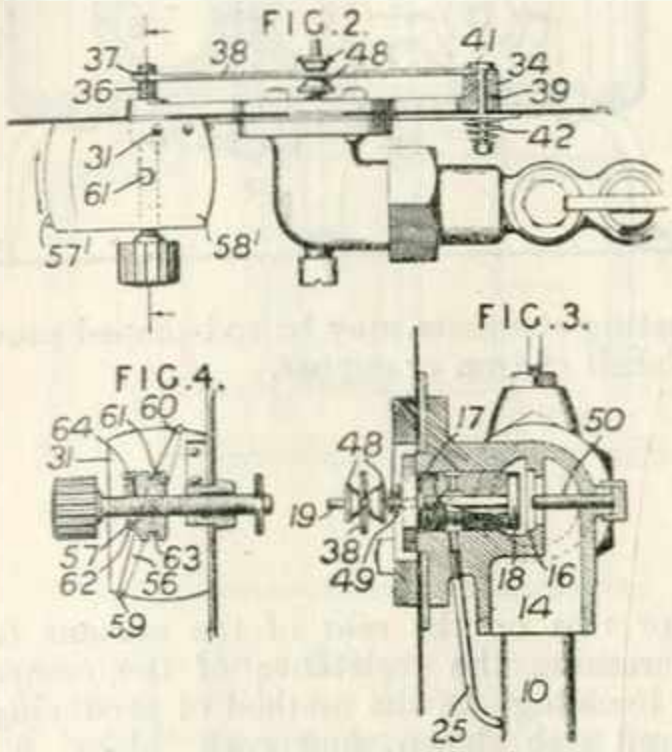


of or the pressure within the space containing the expansible fluid 4. In the construction shown in Fig. 1, a spring 10, the compression of which is regulated by a nut 11, bears directly upon the bellows 8; in a modification, adjustably-weighted lever is arranged to coact with the spindle 9. In a further modification, the bellows 8 is replaced by a rigid tube 17 in which is movable a piston 20 supported by a flexible corrugated tube 18 and connected by a rod 19 to a second piston or head 23, upon which pressure is exerted by an adjustable spring 24.

FIG.3.

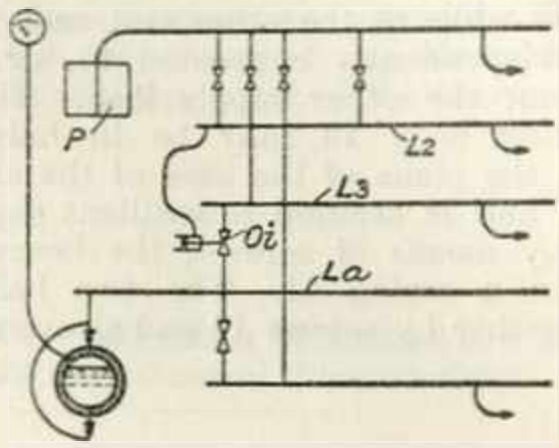


188,105. Claus, E. L., and **Claus, W. E.** Aug. 22, 1921.



Thermostats.—Relates to thermostats for controlling the temperature of ovens of the type comprising a member, such as a bimetallic strip, sensitive to temperature changes and adapted by a deflection in its medial zone to control the gas supply valve. According to the invention the supply of gas to the oven by the pipe 14, Fig. 3, is controlled by a valve 18 co-operating with a seating 16 and having a spindle 19 which is adjustably connected by nuts 48 threaded on the spindle to the centre of the bimetallic or like strip 38 adapted to bow when the temperature of the oven rises. The valve may be prevented from entirely contacting with its seating by an adjustable stop 50 and any gas leaking past the spindle 19 as it slides in a surrounding plug 17 is returned to a pilot pipe 10 by a conduit 25. The thermostatic strip is secured at one end to a lug 34, Fig. 2, inside the oven by means of a spindle 39 with a clamping-head 41 and at the other end engages a reduced portion 37 of a screw 36 by which the strip can be adjusted for different temperatures. Lost motion between the strip 38 and the reduced part 37 is prevented by a spring 49, Fig. 3, which presses the strip continuously against one edge of the reduced part 37. The spindle 39 passing through the lug 34 is controlled by a spring 42 which, supposing the strip has been heated to a high temperature and is being adjusted by the screw 36 to a lower temperature with the valve 18 closed, yields and so prevents damage to the strip 38 by deformation. Mounted on the adjusting screw and capable of being clamped thereon by a screw 64, Fig. 4, is a nut 57 having an annular groove 63 in which engages a pin 62 attached to a pointer 56 pivoted at 61 to a dial 31. The dial is preferably inclined at an angle of about 45° to the vertical and has two sets of graduations, one 57¹ denoting temperatures and the other 58¹ denoting the corresponding purpose for which the temperature is suitable, the ends 59, 60 of the pointer 56 moving over the two scales.

188,305. Aktiebolaget Vaporackumulator. Nov. 1, 1921, [*Convention date*]. *Addition to* 135,479.



Heating systems.—In a steam plant having a flow-over valve O *i* inserted between two low-pressure pipe lines L3, L*a*, as described in the parent Specification, the valve is actuated by the pressure in a pipe line L2 in which the pressure is different from that in the boiler P.

189,141. Leidenroth, G. Nov. 19, 1921, [*Convention date*]. *Drawings to Specification.*

Heating vehicles.— A supplementary boiler, using ordinary water, is used on condensing locomotives to supply the steam for heating the carriages, thus enabling the locomotive to run with a minimum reserve of specially purified feed water.

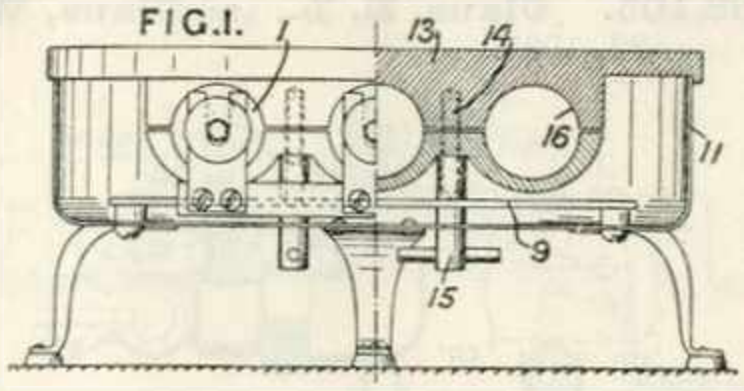
189,270. General Electric Co., Ltd., and **Bartlett, A. C.** Sept. 9, 1921.

Thermostats.—An electrically-heated wire, such as the cathode filament of a discharge tube, is maintained at a constant temperature, in spite of changes in the diameter of the wire, by placing, in series with the wire, a resistance of constant value, equal to one-third of the resistance of the wire, and maintaining a constant potential across the ends of the wire and resistance. The heated wire must be either in a vacuum, or of a diameter so large that the conduction and convection losses are proportional to the surface of the wire.

189,469. Johansen, G. L. Nov. 24, 1922.

Heat-storing apparatus.— An electric heating apparatus, such as a cooking-plate, heating furnace, iron or the like, is provided with heating elements 1 interchangeably mounted in open-ended channels 16 in a heat-accumulating body 13, the cross-section of the heating elements and the channels being such that the elements lie

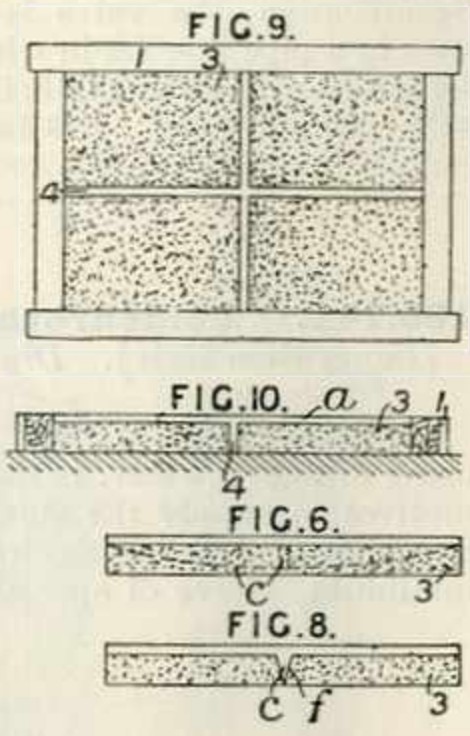
in the channels, when cold, but press firmly against the channel walls when heated, so as to effect efficient heat transmission. The elements are all connected at one end to one supply lead while at the other end each element may be independently connected to, or disconnected from, the other supply lead. The heat-accumulating body 13 may be in halves and divided in the plane of the axes of the channels. The lower half is secured to resilient supporting beams 9 by means of screws, the beams being mounted in a casing 11. The two halves are secured together by screws 14 and sleeve nuts 15.



The heating elements may be rod-shaped provided with a shell of iron or copper.

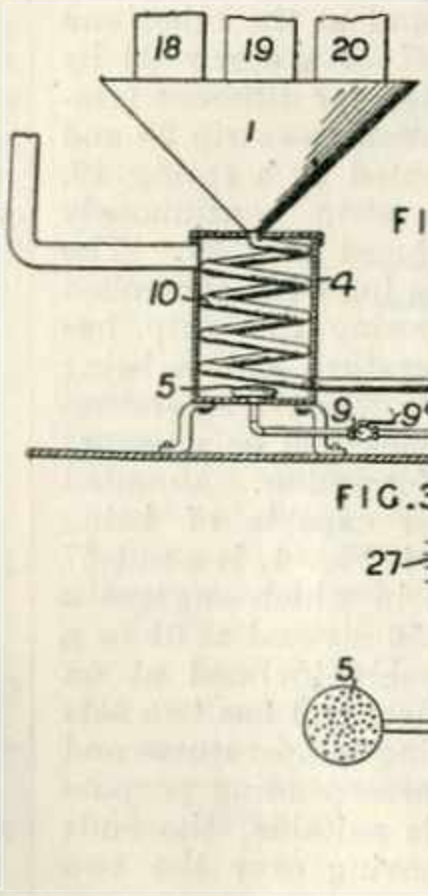
189,685. Anderson, R. W. Jan. 20, 1922.

Non-conducting coverings. — In an insulating slab for lining the walls of cold storage chambers or for similar purposes of the kind comprising a lower stratum of granulated cork and a facing layer of cement, a series of grooves or spaces 4, Figs. 9 and 10, are formed in the cork stratum 3 and filled with the element of the cement facing, thereby producing a series or ribs on the rear of the cement facing and increasing the resistance of the compound slab to buckling. In the method of producing the compound slab shown, four cork slabs 3 are arranged in a rectangular mould 1 and the cement filled into the spaces above and between the cork slabs thus producing the facing *a* and cross-ribs 4 extending to the rear of the compound slabs. The ribs 4 may also be arranged to extend diagonally, or, in cases where the cork slab is produced by moulding, the grooves *c*, Fig. 6, for receiving the cement may not extend to the rear of the cork 3 and may be deepest in the centre. In a further construction, Fig. 8, a cork slab is cut across obliquely and one part is inverted so as to produce between the two parts a **V**-shaped groove *f* into which cement is pressed to form the strengthening-rib *c*.

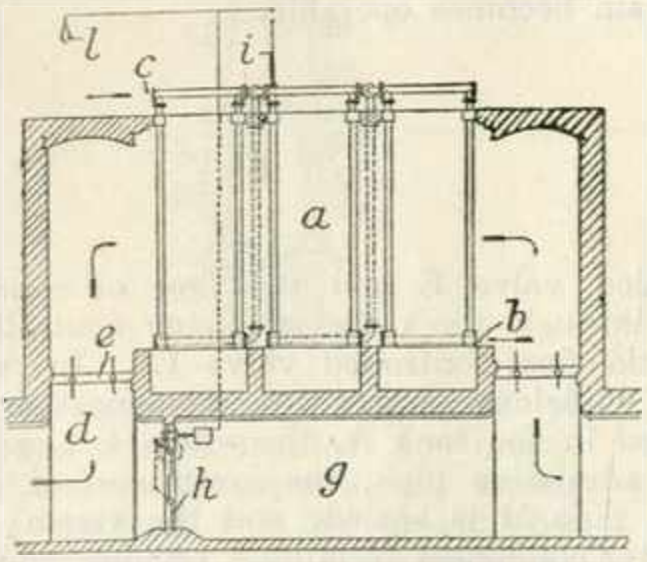


190,014. Harlow, H. Dec. 19, 1921.

Thermostats.—In apparatus for heating air, for use in warming buildings, of the kind in which air is forced through a heater by a fan, the supply of hot air is automatically regulated by a thermostat which controls simultaneously the speed of a motor driving the fan and the valve supplying fuel to the heater. As shown, the apparatus comprises a casing 4 within which are arranged a gas burner 5 and a coiled pipe 10 connected at its lower end to a casing 10^b surrounding a fan 14 driven by a motor 11 and at its upper end to a drum 1 carrying distributing pipes 18, 19, 20. The means for controlling the gas-valve 9 and the speed of the motor 11 are shown in Fig. 3 and comprise a thermostat 28 carrying a contact 29 movable into engagement with a stationary contact 30, thus closing the circuit provided by wires 31, 32 leading from the source of current 27 and energizing the electromagnets 33, 34. The operation of the motor 11 is controlled by a rheostat 23 which, with the swinging slotted arm 24 is in the circuit of the motor. On contact of the members 29, 30 the magnets 33, 34 attract armatures 35, 36 connected to sliding rods 37, 38, the movement of which is communicated through pins 41, 42 to the slotted arms 9^a, 24 which control the gas supply valve 9 and the speed of the motor 11 respectively.



190,395. Babcock & Wilcox, Ltd., (*Deutsche Babcock & Wilcox Dampfkessel-werke Akt.-Ges.*). March 11, 1922.

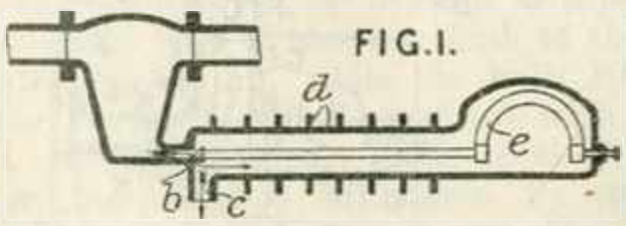


Thermostats.—In a flue-gas emonomizer of the kind provided with a thermometric device *i* adapted to indicate the temperature of the feed-water and also automatically to control the temperature by actuating flue dampers, the thermometric device is located between the inlet *b* and outlet *c* of the economizer *a* at a point one-third of the way from the outlet *c*. In the arrangement shown, the gases from the flue *d*, which normally flow past dampers *e* across the tubes of the economizer, may be wholly or partially bye-passed through a flue *g* by the opening of a motor-cotrolled damper *h* when the temperature reaches a predetermined maximum. A lamp *l* connected in the circuit may give a visual indication when this temperature has been attained, and the dampers *e* may be closed simultaneously with the opening of the damper *h*. A series of contacts may be provided on the thermometric device *i* for affecting a gradual opening of the damper *h*.

190,423. FitzPatrick, O. C. Aug. 22, 1922.

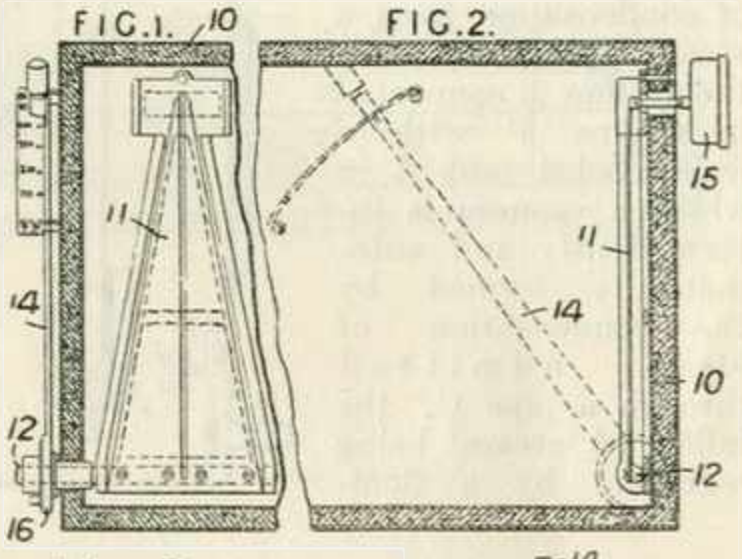
Hot-water bottles.—A removable cover for a hot-water bottle is formed as a toy, doll, or mascot.

190,696. Friedmann, A., [Firm of]. Dec. 23, 1921, [*Convention date*].

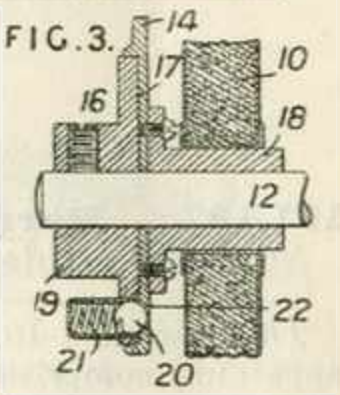


Steam-traps.—In steam-traps of the type in which the water outlet *c* is arranged between the discharge-valve *b* and the thermostatic element *e* controlling it, or below the latter, an air-cooled surface *d* is inserted between the valve and thermostatic element in order that any steam formed from the water during its discharge, owing to a decrease in pressure, shall be condensed before reaching the thermostatic element. The valve closes when an excess of dry steam has passed through it and has reached the thermostatic element.

190,755. British Thomson - Houston Co., Ltd., (*General Electric Co.*). Aug. 24, 1921.



Thermostats.—In a thermostat of the type in which, to change the temperature setting, a bimetallic strip is subjected to an initial stress in opposition to the stress set up therein by expansion, the element is in the form of a relatively flat member, one end of which operates an electric switch or like device controlling the heat supply. In order to prevent excessive strain in the thermostatic element when the temperature exceeds the predetermined value or a high temperature setting is being effected, the element 11, which co-operates with a snap switch 15, is secured to a rotatable shaft or support 12, between which and the adjustable elements 14, 18 for varying the temperature setting a slip connection is provided. In the construction shown, the slip connection comprises a spring-pressed ball 20, Fig. 3, which is mounted on a flange 19 secured to the shaft 12 and is adapted to engage a depression 22 in the face 17 of a regulator arm 14 to which is attached a bushing 18 located in the wall 10 of an oven or the like. When the temperature of the oven is in the neighbourhood of the temperature to which the arm 14 is set, the shaft 12 also remains stationary and the bimetallic strip 11 moves either to the left, Fig. 2, to open the switch 15 or to the right to close the switch according as the temperature is above or below the predetermined valve. Should a further rise in temperature occur after the switch 15 has been opened, the strip 11 is put under strain until it exerts a torque on the shaft 12 sufficient to overcome the clamping friction of the ball 20,

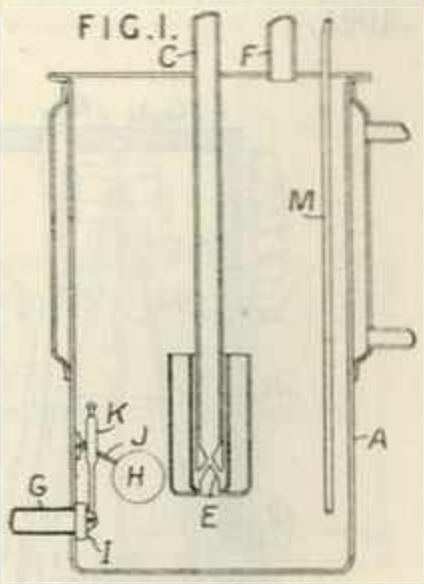


which passes out of the depression 22 and leaves the shaft 12 free to rotate. Similarly, when the current supply to the oven is broken at a main switch, the oven cools and the switch 15 is closed, and finally the shaft 12 is disengaged and rotates freely; on again closing the main switch, the shaft 12 rotates in the opposite direction as the oven heats up until the ball 20 springs into the recess 22, after which the thermostatic control again becomes operable.

190,801. Boxell, S. Sept. 29, 1921.

Heating buildings, steam-traps.—In order to drain away the water of condensation from a steam-heating system, the system is connected by a pipe F with a water-cooled tank A in which a vacuum is intermittently and automatically formed by the condensation of steam admitted through a pipe C, the inflow of steam being regulated by a float-controlled valve E and the flow of condensed water through the outlet G being controlled by a second float-controlled valve I. In action, when sufficient water of condensation has collected in the tank A, the valve E closes the steam admission pipe, the lower end of an air release pipe M is sealed, and the steam above the water condenses forming a vacuum and withdrawing further water of condensation from the system. This causes the float H to rise and by means of an arm J having a lost motion connection with a link K the valve I is opened and remains open until a definite amount of the condensed water has been discharged, when the series of operations is repeated.

FIG. 1.



191,187. Harris, A. C. Oct. 13, 1921.
No Patent granted (Sealing fee not paid).

Thermostats.—In a self-contained hot-water apparatus comprising supply tank, hot water tank, boiler and heating means, shown as a burner H, and a vacuum jacketed container *c* for storing the hot water, the temperature of the water governs the heating means, which is shown as a gas burner, by means of a container G^1 connected by a tube G^2 to a capsule G operating through levers G^3, G^4, G^5, a weight B^4 which drops, on the expansion of the liquid within the container G^1, and compresses a leather diaphragm B^5, cutting off the gas supply. A weighted lever J is in unstable equilibrium. The weight normally assists the weight B^4. On depressing the outer end of the lever J, the weight is transferred to tend to lift the weight B^4 and thus cause the gas to be cut off at a higher temperature. Or the thermostat may be cut out of action by continued depression of the outer end of the lever J. If an oil lamp is used the thermostat operates an extinguisher which leaves a small portion of wick uncovered to act as a pilot flame. If the heating is electrical the thermostat lever G^5, Fig. 5, forms with the contacts K, K^1, a switch controlling the current to resistances K^2 inside the container C.

FIG. 1.

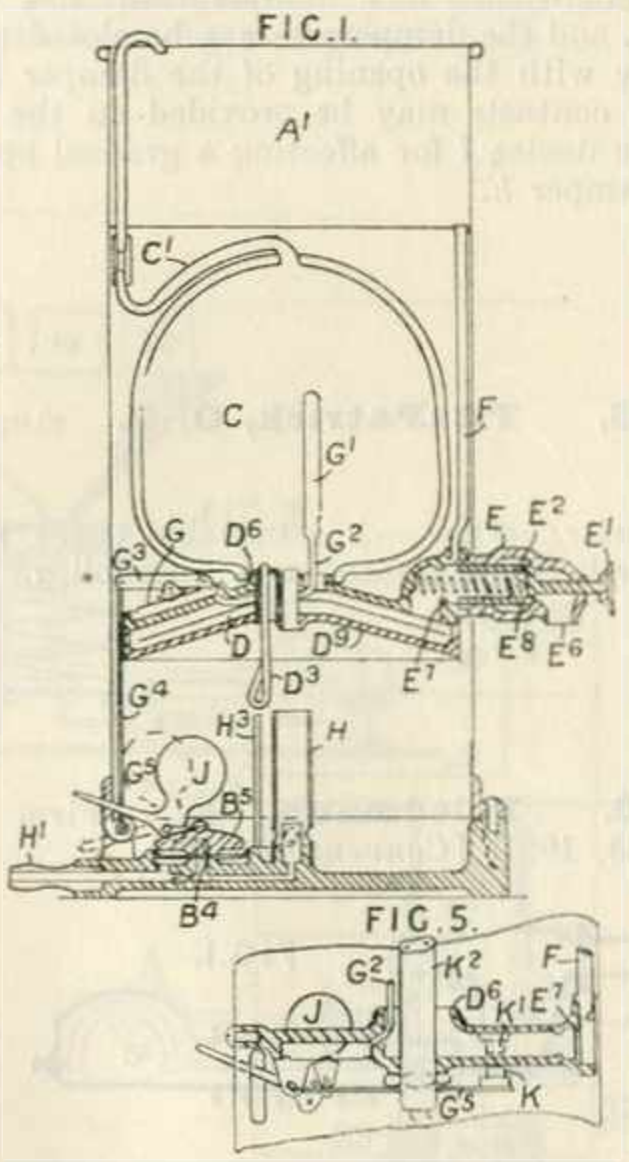


FIG. 5.

191,219. Anderson, A. Aug. 3, 1922.

FIG. 4.

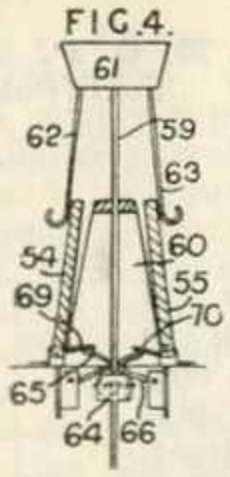
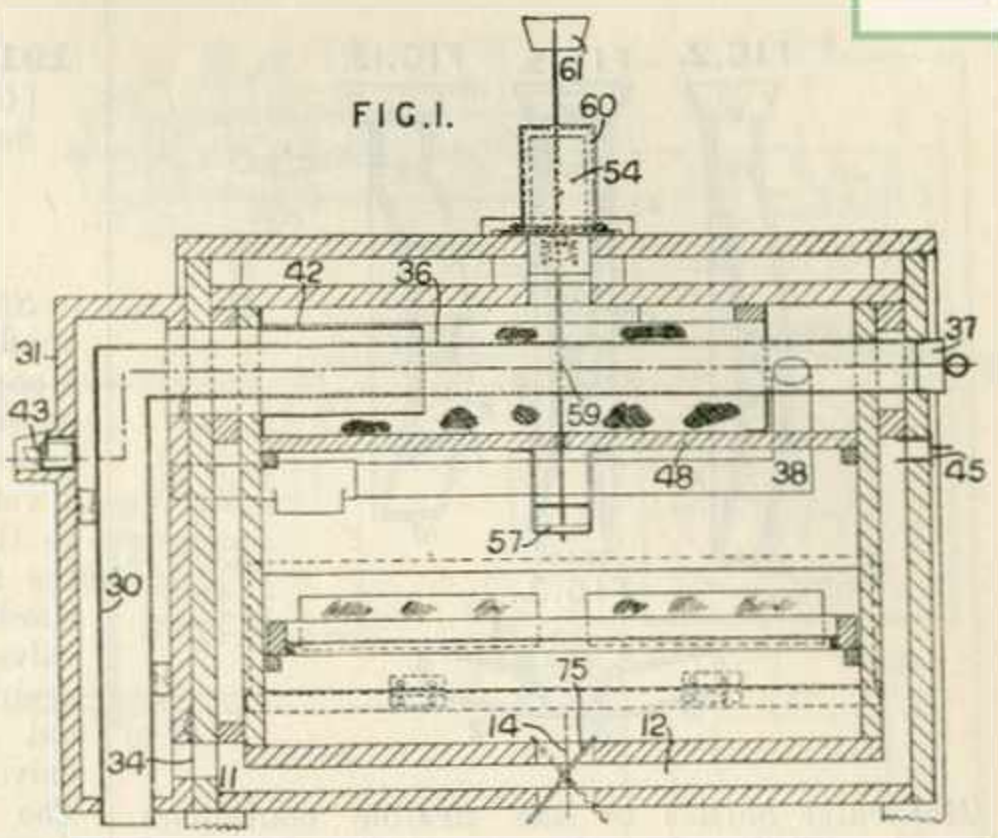


FIG. 1.



Thermostats.—The temperature of an incubator is controlled by means of a thermostatic capsule 57 acting upon a weighted rod 59. A stop 64, Fig. 4, upon the rod 59 moves the levers 65, 66 which act upon arms 69, 70 attached to hinged valves 54, 55. These valves when opened allow hot air to escape from the interior of the incubator through a casing 60. The movement of the valves is limited by stops 62, 63 depending from the weight-pan 61.

191,515. MacLaren, R. Nov. 26, 1921.

FIG. 1.

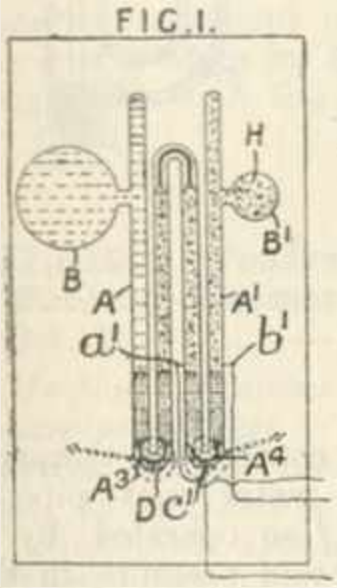


FIG. 3.

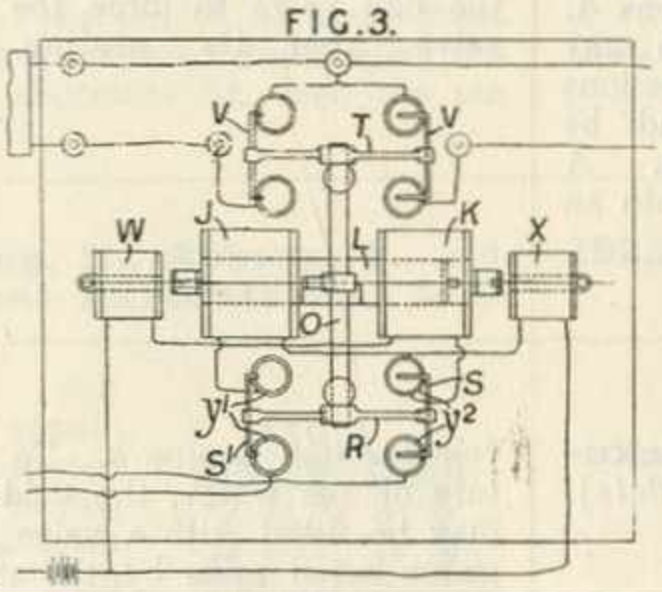


FIG. 4.

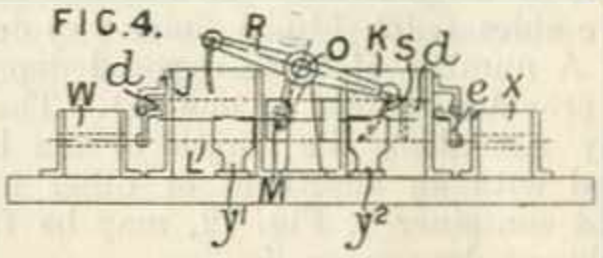
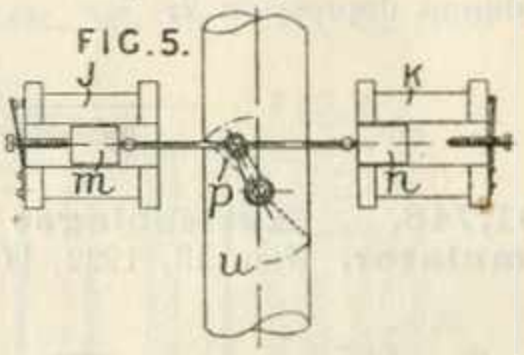
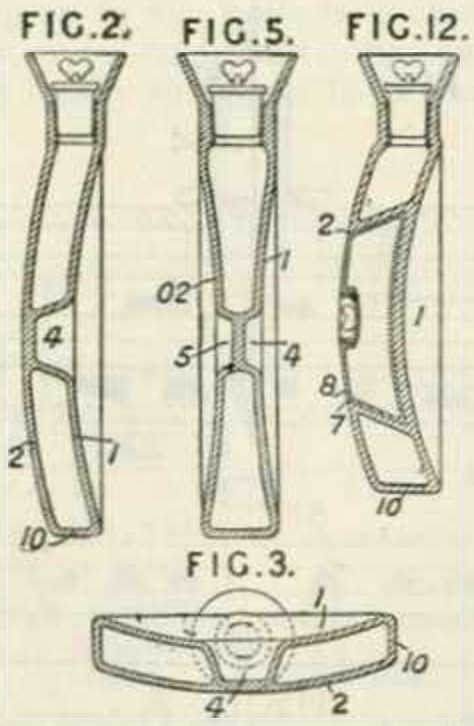


FIG. 5.



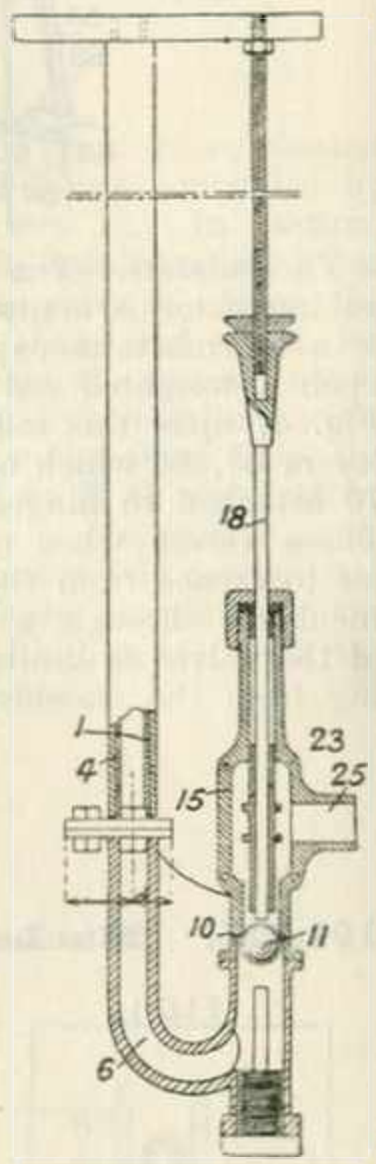
Thermostats.—Relates to thermostats for controlling the temperature of electric or hot water radiators or heating and cooling apparatus of the type comprising a double **U**-tube A, A¹, Fig. 1, containing expansible fluid co-operating with a two solenoid relay which is provided with a locking-device and controls a valve or electric switch. The two **U**-tubes A, A¹ communicate respectively with large and small bulbs B, B¹, the lower portions A³, A⁴ of each **U**-tube contain mercury, the bulb B and one limb of the **U**-tube A contain glycerine, while the bulb B¹ and remainder of the **U**-tubes are filled with an inert gas H such as nitrogen. The level of the mercury in the limbs is adjustable by means of adjustable graduated screw-caps D connected with plungers. Maximum and minimum terminals b^1, a^1 and an intermediate terminal c^1 in the **U**-tube A¹ are connected in circuit with mercury cups y^1, y^2, Fig. 3, contacts S, S¹ on a rocking-arm R and solenoids J, K for the purpose of rotating a shaft O controlling the main valve or switch. In the arrangement shown in Figs. 3 and 4, the solenoid core L has a pin M engaging a slotted arm on the shaft O, which carries at its other extremity a rocking arm T with contacts V for completing or breaking the main electric circuit. In order to hold the solenoid cone L in its extreme positions against vibration, small pivoted hooks *e* controllled by solenoids W, X arranged in series with the solenoids K, J respectively are adapted to co-operate with catches *d* on the solenoid core. The double **U**-tubes, relay solenoids, and rocking arms R, T are preferably all mounted on a single stand. In a modification, Fig. 5, the solenoids J, K are arranged to operate directly through the cores *m*, *n* a butterfly valve *p* controlling the passage of gas or steam through a pipe *u*.

191,643. **Sampson, R. W.** Feb. 27, 1922.



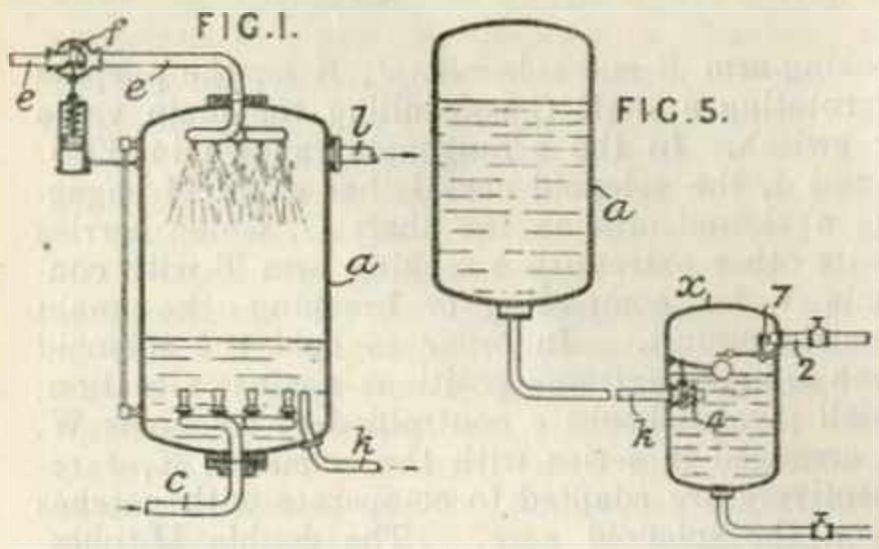
Hot-water bottles or like flexible containers formed with broad surfaces united and spaced by an integral marginal wall are provided with an integral middle cup-shaped spacing element extending between the broad surfaces. The rubber surfaces 1, 2, Figs. 2, 3, of a hot water bottle are curved transversely and longitudinally and are united by the wall 10. A cup-shaped tapered element 4 in the middle of the bag is formed as shown. In a modification, a flat side is used in place of the convex. In another form two concave sides 1, 02, Fig. 5, have two depressions 4, 5. A number of these opposed depressions may be provided instead of one set. The depressions may run along the length of the bag and be filled with an absorbent or other material. A rigid container 8, Fig. 12, may be fitted into an undercut depression 7.

191,743. Briquet, E. C. P. Jan. 12, 1922, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*].



Steam-traps.—Water of condensation collecting in a copper or like tube 1 connected to a steam pipe causes the tube to contract, a valve casing 15 attached to the free bottom end of the tube being moved upwards thus bringing the ball valve 11 in the casing against the end of a fixed rod 18, and forcing the valve from its seating 10. The water is discharged through an opening 25 in the valve casing. The tube is surrounded by an iron or like tube 4 and is secured by a non-symmetrical flange to an elbow 6 on the valve casing. A sleeve 23 connected to a handle may be moved downwards in contact with the ball valve to force the valve from its seating.

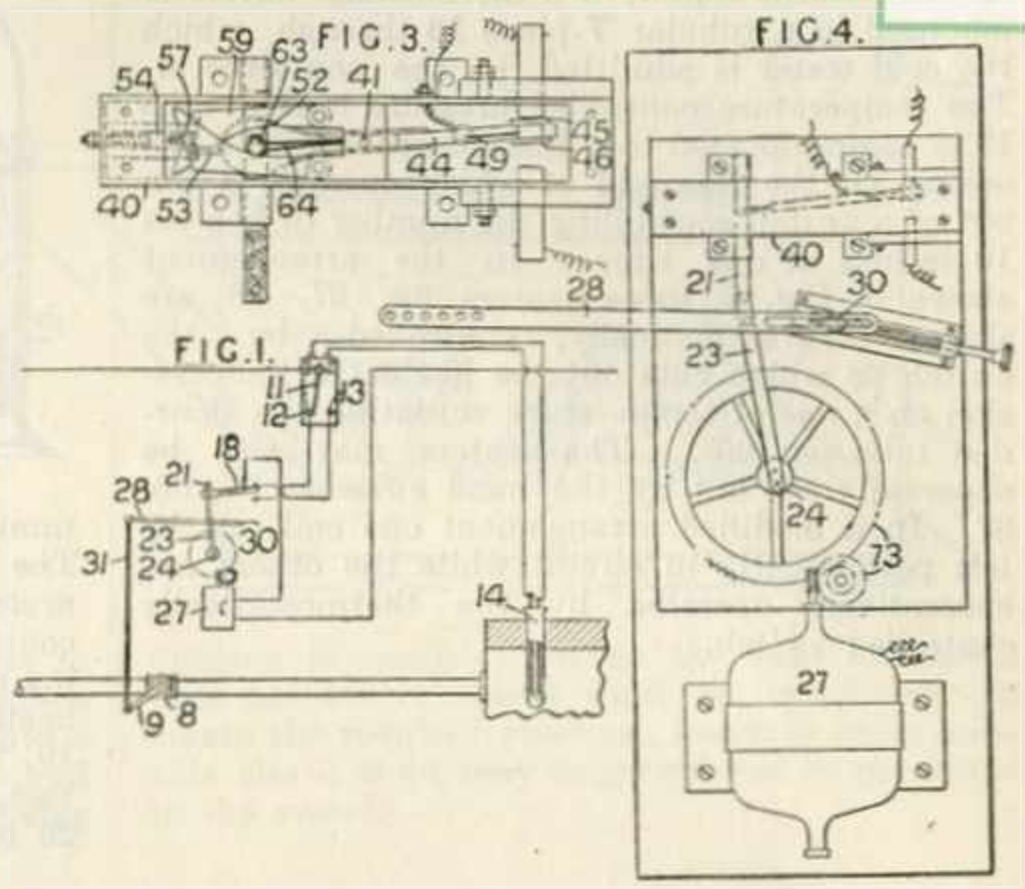
191,746. Aktiebolaget Vaporackumulator. Jan. 13, 1922, [*Convention date*].



Heating systems and apparatus; thermostats.—To maintain an even load on a steam boiler plant having a variable consumption, surplus steam is led into direct contact with water in a storage reservoir *a*, Fig. 1, hot water at a constant temperature being led off from the reservoir through a pipe *k*. To control the temperature of the water, the cold water inlet pipe *e* may be fitted with a valve *f* so operated by a piston acted upon by the steam pressure in the reservoir that when the pressure rises, the valve is opened, and when the pressure falls, the valve is closed. Steam may be led off through a pipe *l*. The operation of the valve *f* may be controlled by a thermostatic capsule in the hot water, the pressure on the capsule acting on a diaphragm connected to the valve. In modifications, the temperature in the container is maintained constant by automatically controlling a valve in the steam supply pipe *c*, the cold water supply being kept constant. The steam may be condensed in a surface condenser before entering the reservoir. Hot water may be led from the storage reservoir *a*, Fig. 5, to a chamber *x*, from which either hot water or steam may be taken. A float valve 4 closes the inlet pipe *k* when the water in the chamber rises above a certain level. A valve 7 prevents water from entering the steam outlet pipe 2. Specification 6894/14, [*Class* 123 (ii), Steam generators], is referred to.

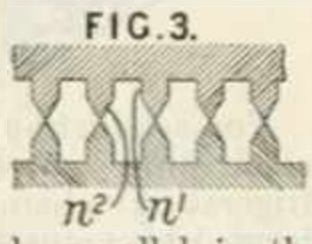
191,778. Haddan, A. J. H., (*Automatic Temperature Control Co.*). Sept. 13, 1921.

Thermostats. — Relates to thermostatically controlled valves for regulating the supply pipes of furnaces or for similar purposes of the type in which a pyrometer or like temperature sensitive device 14, Fig. 1, controls an electric circuit comprising an electric switch 18 and a motor 27 for effecting the opening or closing of the valve 8. Means are provided, when the electric circuit is closed, for locking the switch in its open or closed position. As shown, the pyrometer 14 controls the movements of an armature 11 which makes contact at the upper and lower limits of temperature with terminals 12, 13 to close the motor circuit, while the motor drives a wheel 73, Fig. 4, having an eccentric pin 24 to which is connected a rod 23 actuating a sliding bar 21 which directly operates the switch 18. The switch itself comprises a non-conducting strip 44 which is pivoted at 41 in a casing 40, Fig. 3, and is fitted with a terminal 49 and contacts 45, 46, and is connected by blade springs 64 to a pin 63 on the bar 21. The strip 44 also carries a loop 52 having a tongue 53 engaging behind a spring-pressed sliding abutment 54 so as to lock the switch in its extreme positions. When the bar 21 is actuated the corresponding movement of the pin 63 at first causes the spring 64 to be bent without disengaging the tongue 53 from the abutment 54, then the pin 63 engages one of a pair of pivoted cams 59, which by co-operating with a pin 57 on the abutment 54 forces the latter backwards until the tongue 53 is released and the switch is allowed to snap over to its other extreme position, the motor circuit being thus broken until it is reclosed by movement of the armature 11. The arm 23 is connected to the valve 8 through links 9, 31 and 28, the last of which is mounted on an adjustable pivot 30, Fig. 4

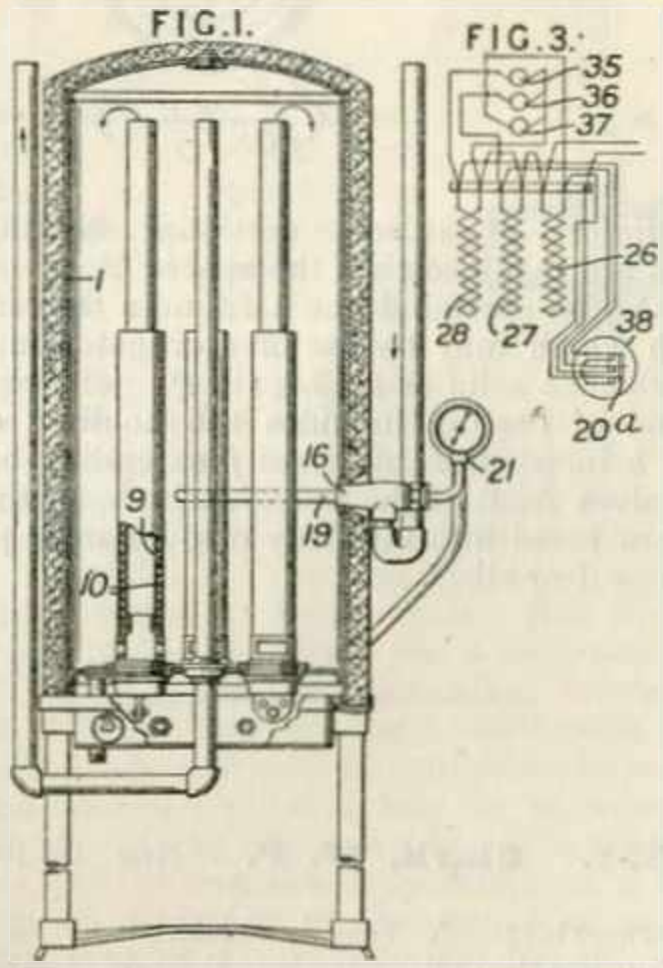


191,812. Testrup, N., Boberg, T., and **Techno-Chemical Laboratories, Ltd.** Oct. 15, 1921.

Heating systems and apparatus.—Moist plastic material such as macerated peat, lignite, &c. is heated or dried while spread upon surfaces provided with grooves or channels, the sides of which are approximately parallel in the lower portion n^1 and flare outwards at the top. The grooves may be formed on the outer surface of hollow rotary drums heated internally by steam, which may be obtained by compression of the evolved vapours, as described, for example, in Specification 149,055, [*Class* 32, Distilling &c.]. A series of drums may be arranged to operate in multiple effect. The material may be fed between two drums with parallel axes, adapted to be adjusted both laterally and longitudinally so that the ridges between the grooves are over each other, or the ridges of one drum lie over or enter the grooves of the other. The material may be fed to a drum by a plain roller or by a plate held against the drum and is removed by rotary brushes or toothed scrapers. The grooves may pass round the circumference of the drum or longitudinally across the circumference.



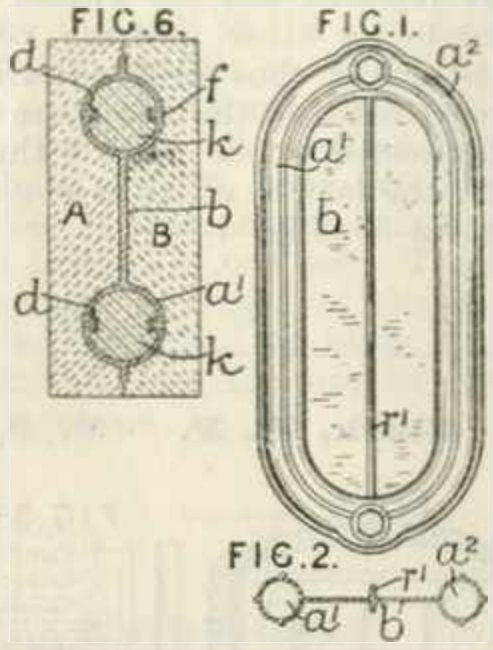
192,206. Clark, W. F. Nov. 9, 1921.



Thermostats.—A water heater comprises a legged container 1 within which are mounted circulation tubes 9 each of which is encircled by a

cylindrical electric heater 10. The tube 19, containing volatile liquid, of a thermostatic device is mounted in a tubular T-piece 16 through which the cold water is admitted to the container 1. The temperature controlled pressure is the tube 19 is communicated to a Bourdon tube within the casing 21, the free end of which operates a pin 20^a of a switch controlling the number of heaters 10 in use at one time. In the arrangement shown in Fig. 3, three heaters 26, 27, 28 are shown diagrammatically, controlled by the switch 38 which cuts out the heaters in succession on a rise of temperature actuating the Bourdon tube pin 20^a. The heaters may also be separately cut out by the hand switches 35, 36, 37. In a modified arrangement one coil can be left permanently in circuit while the others are successively operated by the thermostatically controlled switch.

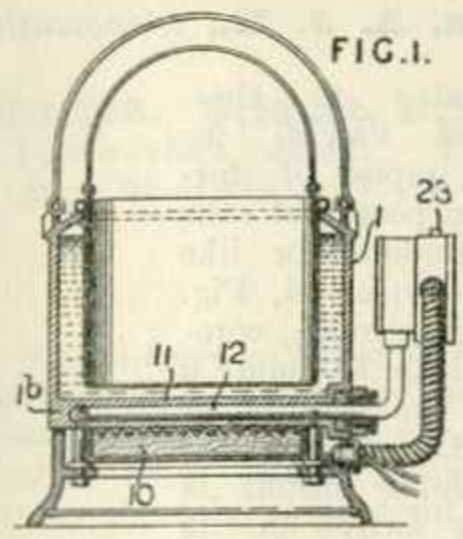
192,300. Rushen, P. C., (*Berlin-Burger Eisenwerk Akt.-Ges.*). Feb. 23, 1922.

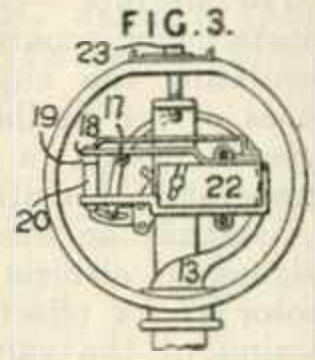


Radiators.—Cast-iron sectional heating elements are made so that the spaces a^1, a^2 or heating medium surround like a frame a thin metallic web *b* which may be flat or corrugated and with or without a solid or hollow rib r^1. The preferred method of casting includes the holding of the cores *k* in position by wires *f* extending between the halves A, B of the mould, which, in the casting, are fused into inwardly or outwardly projecting lugs *d* or ribs.

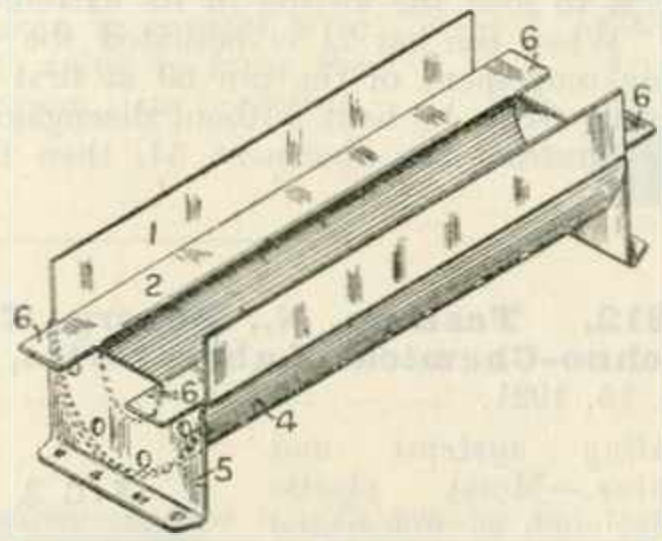
192,511. Clark, W. F. Nov. 9, 1921.

Thermostats.—A vessel, shown as a glue-pot, for heating liquids by electric heaters 10 supported beneath the bottom, is provided with a cavity 11 in the bottom plate 1^b in which extends a tube 12 containing volatile liquid in communication with a Bourdon tube 13, Fig. 3. The movement of the free end of the tube 13 according to the temperature is conveyed to a contact arm 18 through a pin 17, and the opening and closing of the electric circuit through the heating elements 10 is effected through contacts 19, 20. The block 22 carrying the flexible contact arm 18 can be raised or lowered by a screw 23 to effect adjustment of the limit temperature.





192,560. Booth, A. H. Dec. 19, 1921.

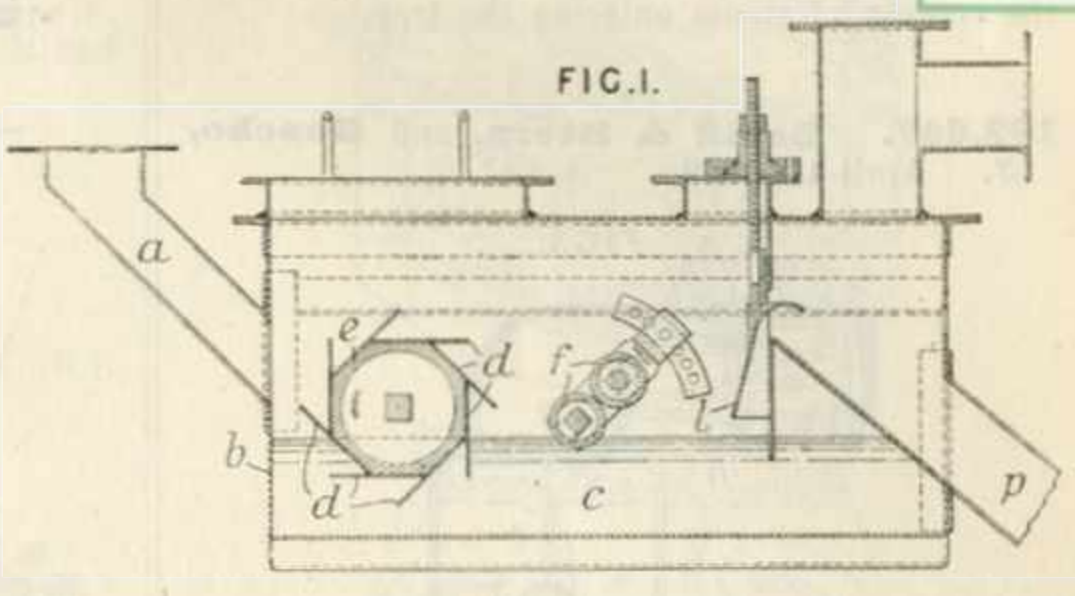


Non-conducting coverings for heat. — Non-conducting coverings for pipes, walls of refrigerating chambers or similar purposes are formed by saturating slag-wool silicate cotton or like fibrous material with a stiffening solution of starch, pressing the material to the required shape and finally drying the shaped material. Preferably a starch or sago solution of about 1.5 per cent strength is employed, and, in the case of sectional coverings for pipes, an external binding of calico or like fabric coated with adhesive is applied for holding the sections together. In making semi-circular or like sectional coverings for pipes a moulding apparatus is used comprising a perforated trough-shaped supporting-member 4 having feet 5, a part-circular perforated moulding-member 1 supported in the trough 4, and an inner moulding-member or cone 2 having projections 6 resting on the feet 5.

192,572. Thermal Industrial & Chemical (T.I.C.) Research Co., Ltd. and **Morgan, J. S.** Jan. 4, 1922.

Heating systems and apparatus.—In a process of heating granular or powdered materials by immersion in molten metal the materials are removed from the metal bath free from adhering metal by being conveyed through a discharge pipe by means of fluid pressure within the apparatus. When the process is one of destructive distillation the material such as sawdust is fed down a shoot *a* into a tank *b* and is carried through molten lead *c* by the blades *d* of a drum *e* so that the treated material reaches adjustable rollers *f* between which it is crushed. The crushed material passes to beneath an adjustable hooded plate *l* and is driven by pressure of the distillation products up into a discharging shoot *p* freed from globules of lead which fall back into the bath before the discharge opening is reached. When the heat treatment does not evolve elastic fluid or insufficient to create the required pressure, steam or other suitable elastic fluid may be introduced or generated in the vessel.

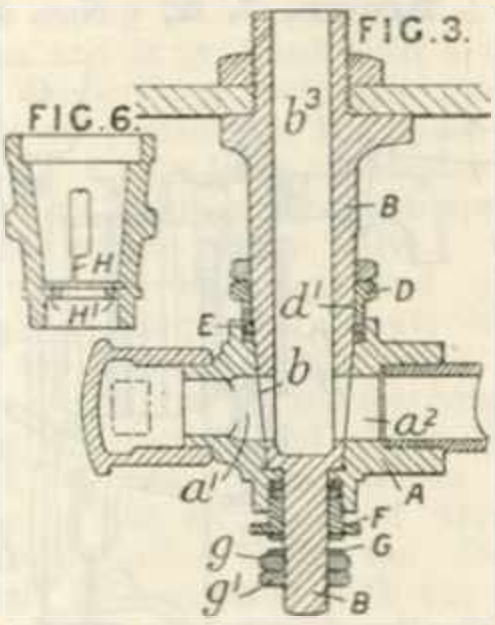
FIG. 1.



192,577. Kay, J. Jan. 7, 1922.

FIG. 3.

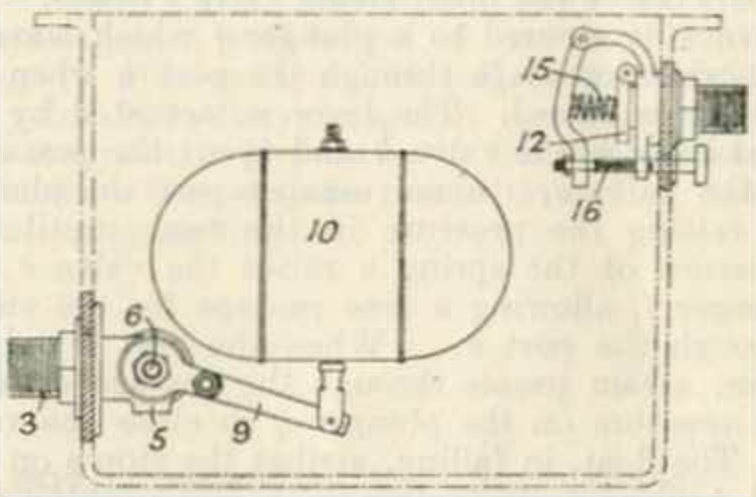
FIG. 6.



Steam-traps.—A rotary conical valve for a steam-trap is provided with means for preventing binding due to heat expansion. The casing A is provided with an outlet port a^1 to the air, and a port a^2 to a hollow float. A hollow plug B is fitted with the usual conical portion *b* and with an inlet b^3 for steam. The parallel portion d^1 of the plug is threaded and carries a screwed sleeve D which compresses packing E, and adjusts the position of the plug. The smaller end of the plug carries lock-nuts *g*, g^1, a spring G, and a sleeve F, the latter screwing into the casing. Two grooves H, Fig. 6, lead from the ports to an annular groove H^1 so that water may pass slowly from the inlet to the float and a sudden rush is prevented.

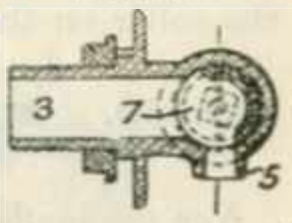
192,608. Grant, C. de V., and **Williams, Sir W. W.** Feb. 1, 1922.

FIG. 1.



Steam-traps.—In a steam and grease trap of the kind described in Specification 2679/09, the float controlled, rotary conical plug valve has a port formed as a longitudinal recess adapted to work over a corresponding opening formed in the lower wall of valve casing to enable a large discharge opening to be obtained for a partial rotation of the valve. The inlet flap valves are also spring controlled, the load on the valves being adjustable. The arm 9 connected to the float 10 operates a conical rotary plug 6, shown in section in Fig. 4, which has a longitudinal recess 7 which opens communication between the branch 5 inside the trap, and the branch 3 outside. The inlet valve 12 is controlled by a spring 15; the load of the valve may be adjusted from outside the trap by the screw 16. The inlet valve 12 may also be connected by means of a curved lever to an extension of the arm 9 so as to be operated directly by the rise and fall of the float 10. For high pressure steam the inlet valve 12 is of conical shape having a step passing through the valve casing and surrounded by a spring. A

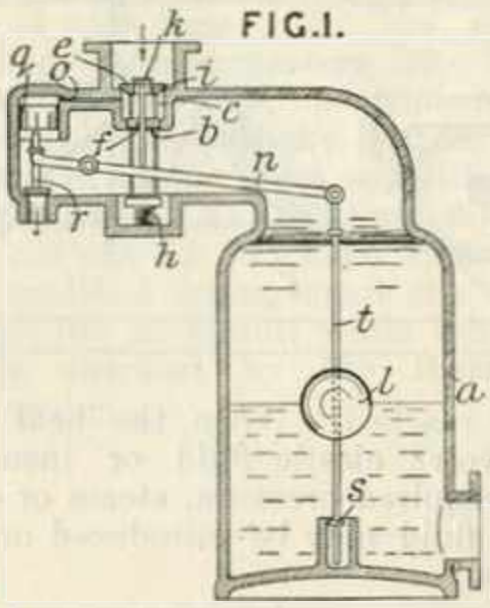
FIG. 4.



gauze strainer is placed below the valve which may contain shot or other material to break up the column of steam entering the trap.

192,647. Schiff & Stern, and **Gascho, J.** April 12, 1922.

FIG.1.



Steam-traps.—In a steam-trap or the like in which liquid is expelled from a tank by steam or gas pressure a chamber *c* is interposed between the steam inlet valve *e* and the tank *a*, and communicates with the latter by means of a throttling device so that equalization of pressure occurs before the main steam valve *e* opens. The valve *e* is secured to a plunger *f* which leaves a constricted passage through the port *b* when the valve *e* is closed. The lever *n*, actuated by the float *l* raises the valve *k* and opens the passage *i* in the valve *e*. Steam escapes past the plunger *f*, raising the pressure in the tank until the pressure of the spring *h* raises the valve *e* and plunger *f*, allowing a free passage for the steam through the port *b*. When the port *k* only is open, steam passes through the passage *o* exerting pressure on the plunger *q* to close the valve *r*. The float, in falling, strikes the stop *s* on the rod *t* closing the valves *k*, *e* and opening the valve *r*, the shorter arm of the lever *n* striking the collar on the valve-rod.

192,659. Miki, Y. May 24, 1922. *Drawings to Specification.*

Non-conducting coverings for heat.—In non-conducting coverings of the type in which a corrugated sheet is secured to a flat sheet, with the former next to the surface to be insulated, the sheets consist of wire gauze coverd with a composition of magnesia, a fibrous material such as asbestos or silicate cotton and an adhesive material.

192,912. Saez, B. Jan. 31, 1922.

Foot-warmers.—In a heating-apparatus for motor vehicles and like of the type in which a box-like receptacle 1 containing a series of partitions forming a tortuous path for the exhaust gases from the engine or for the hot water from the engine cooling-system is arranged on or under the floor of the vehicle, the gases or hot water are discharged into the receptacle 1 through a distributing-pipe 6 closed at each end arranged

FIG.1.

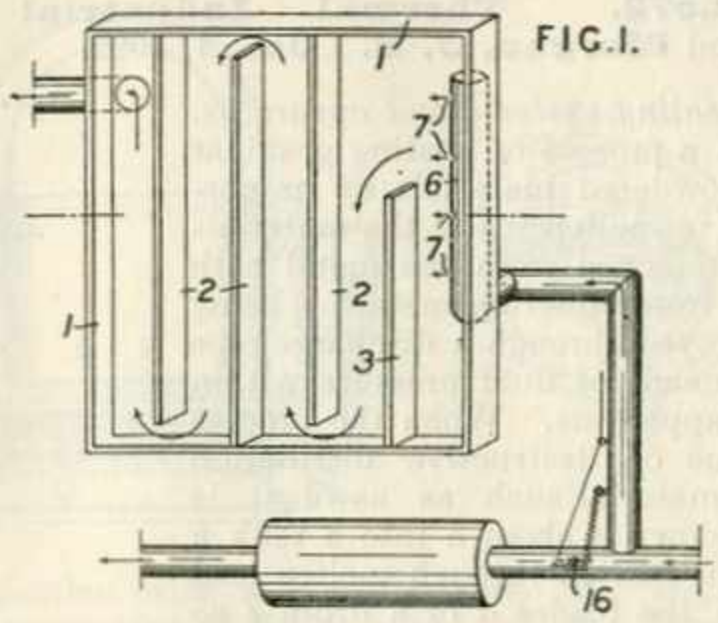
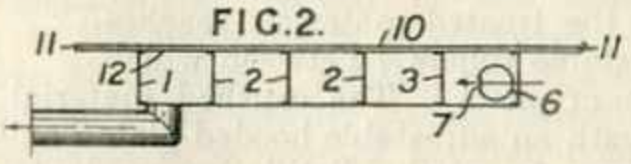


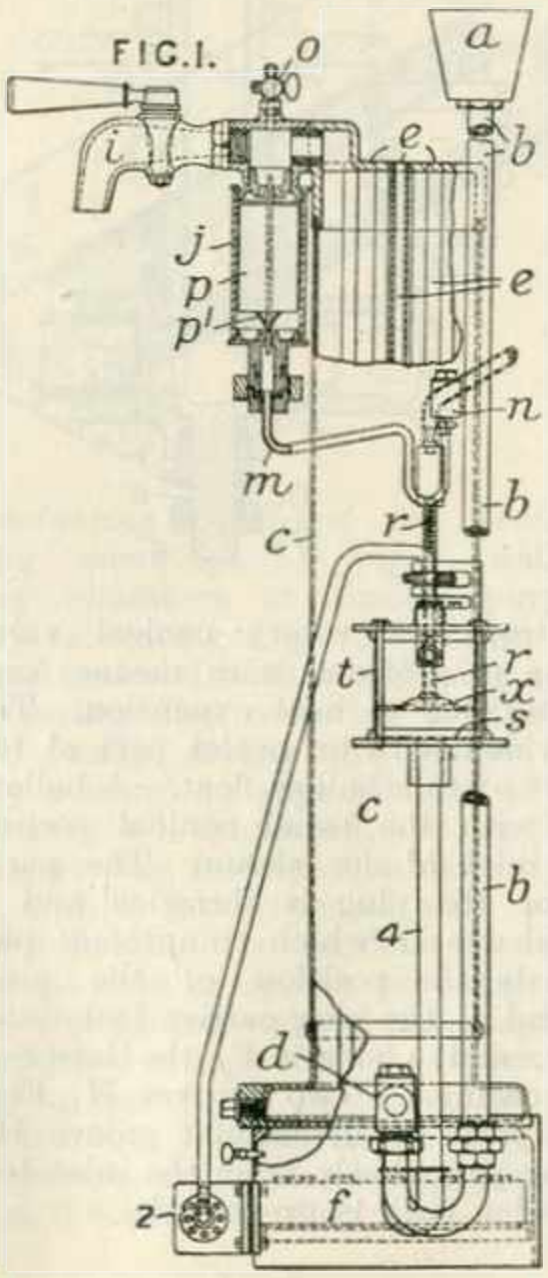
FIG.2.



parallel to the partitions and having lateral discharge orifices 7, two at least of which face on to a partition 3 shorter length than the remaining partition 2. The proportion of gases or hot water diverted into the receptacle 1 is regulated by a spring-controlled valve 16 operated by the driver or passengers. Preferably, the receptacle has a cover formed of two metallic plates 10, 12 with an intermediate asbestos plate 11.

193,140. Brown, J. A. Nov. 17, 1921.

FIG.1.

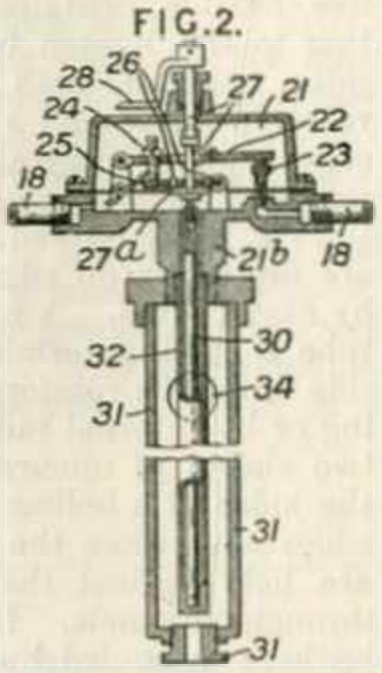


Steam-traps.—In a water heater for delivering boiling water pressure due to the expansion of

water is relieved past the raised float-operated valve p^1 in the metal or glass chamber j, by the tube m and check valve n to the supply pipe b. On the generation of steam the float p, falls and closes the valve p^1.

193,309. Wade, H., (*Trescott, C. B.*). March 30, 1922.

FIG.2.



Thermostats. — The steam supply to a cooking-chamber is regulated by a thermostatically controlled valve. The thermostat comprises a couple 30, 32, enclosed in a casing 31 and suspended from a screwed nipple 21^b, actuating, by a collar 27^a and points 26 on a lever 25, a spring-pressed lever 22 which closes a jet 23 connected to a fluid pressure supply, preferably air. A set screw 24 connects the levers 22, 25. The casing 31 is connected at 34 to the cooking space and is provided with a vent plug. A rise in temperature actuates the thermostat to admit air pressure to the space 21 which is connected by a pipe 18 to a chamber having a diaphragm which abuts against the spring-raised spindle of the steam-supply valve. The air-pressure moves the diaghragm and closes the valve. A fall in temperature shuts off the air-supply and, the pressure being vented through a bleeder valve in the pipe 18, the diaphragm moves in the opposite direction and allows the steam-supply valve to open. This action is made more sudden by the air admitted through the vent which still further cools the couple. A sectional shaft 27 connected with the collar 27^a is provided with an adjusting handle 28.

193,429. Still, W. J. Nov. 21, 1921.

Thermostats.—A water boiling or heating appartus comprises a closed container having an inlet through which the water flows at a fixed rate, heating means so regulated as to raise the water to the desired temperature upon admission and automatic means for so controlling the supply of fuel to the burner that the water in the container is maintained at a constant temperature. The gas supply to the burner is controlled by a thermostatic valve device comprising a tube 30, which contains water and which projects into one of the pockets 11, a diaphragm 31 and a ball valve 33. A fall of vapour pressure in the tube consequent upon a withdrawal of water allows a spring 32 with an attached ball 43 to force the ball valve from its seating. A gas supply sufficient to maintain the water in the full container at constant temperature passes through a notch in the valve seating.

FIG.1.

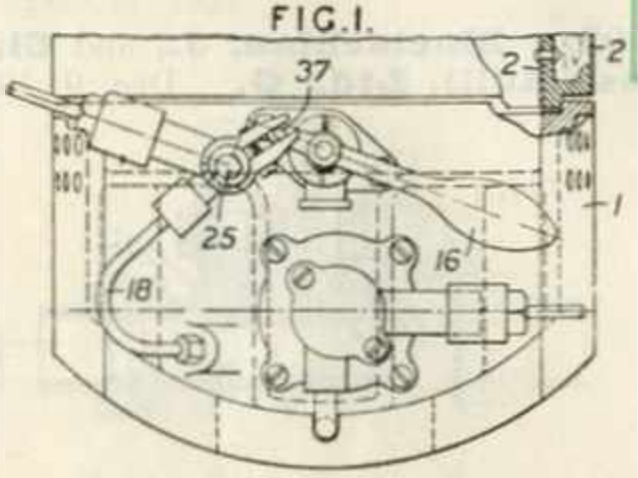
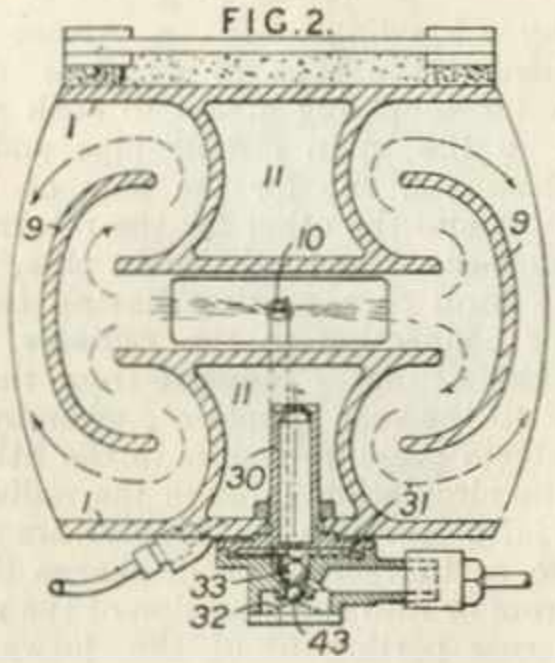
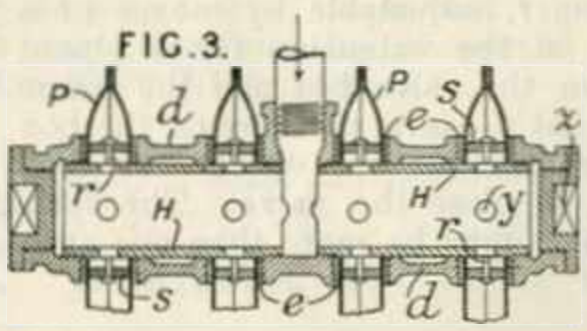


FIG.2.



193,607. Angrick, E. Jan. 10, 1922.

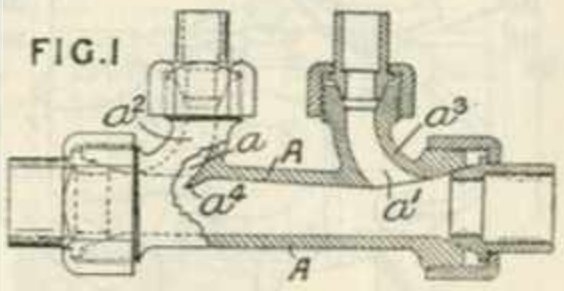
FIG.3.



Radiators are built up of flat sheet metal elements P perforated by distance rings d and held together by pipes H with perforations y serving for the supply or exit of heating medium to or from each element. Each pipe section H is screwed at the eyes right and left handed so that after assembly, by inserting through the hole normally covered by a cap z, a tool to engage the holes y the pipe can be rotated to draw up the sections closely together without rotation of the surfaces in contact with the packing e. Crushing of the elements is prevented by rings s provided with internally-projecting spacing ribs r bearing on the pipe sections H. The connections with the main may be at the centre as shown or at either end.

194,002. **Maclachlan, J.,** and **Clark & Sons (Hull), Ltd., G.** Dec. 9, 1921.

FIG.1



Heating buildings.—In a steam heating-installation of the type in which a distributor fitting A for supplying steam to each radiator is inserted in the main circuit pipe and has two branch passages, one for the flow of steam to the radiator and the other for the return of steam and condensed water to the main pipe, the fitting is in the form of a casting having two nipples a^2, a^3 for connection to the radiator, and the bore of the fitting is reduced from the forward nipple a^2 to the rear nipple a^3, whereby a reduction in steam pressure occurs in the fitting which assists the circulation through the radiator. The passages a, a^1 through the nipples are preferably curved so as to receive or discharge the branch stream from or into the direction of the main flow, and the rear portion a^4 of the forward nipple may project slightly into the bore of the fitting.

194,125. **Sampson, R. W.** Feb. 27, 1922.

FIG.2.

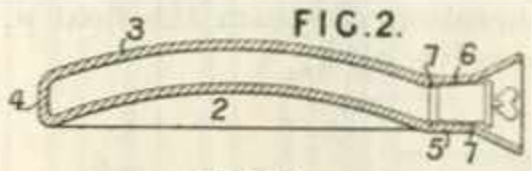
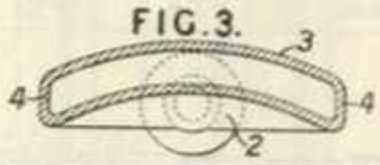


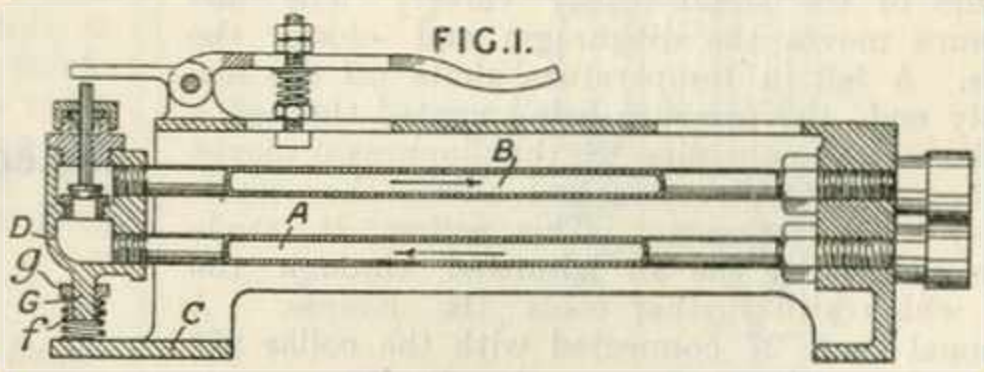
FIG.3.



Hot-water bottles.—Hot-water bottles and like flexible containers particularly for application to the human body comprise broad opposed sides, curved both longitudinally and transversely, united and spaced by a relatively narrow edge wall. Integral strengthening ribs may be provided on the inner surface of one side. The sides 2, 3 are curved, as shown in Figs. 2, 3, and are united by an edge wall 4, the junction being by easy curves. A neck 5 is stiffened by a metal tube 6 having terminal flanges 7. The concave side 2 may be reinforced at its centre by thickening or by internal radial ribs. In manufacturing, two sheets of uncured rubber are placed against the sides of a hollow two-piece mould so that the edges abut when the mould is closed. The parts are held against the mould by vacuum acting through channels. During curing the parts can be kept expanded by internal pressure.

194,227. **Empire Engineering Co. (Manchester), Ltd.,** and **Berry, C. H.** July 5, 1922.

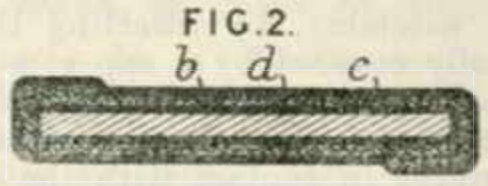
FIG.1.



Steam-traps.—In a steam-trap of the expansion type in which the free ends of tubes A, B, made of metals having different coefficients of expansion, are fitted into a valve box D, a spring f, adjustable by means of a nut g on the extension G, is placed between the valve box and the frame C, so that it exerts pressure on the box in the direction in which the box moves to close the valve. The spring may act on the box indirectly through a lever or levers, and there may be more than one spring.

194,275. **Robertson Co., H. H.,** (Assignees of *Young, J. H.*). Feb. 24, 1922, [*Convention date*].

FIG.2.



Fireproof coverings.—Metal articles, such as bars, sheets, &c. for building purposes, are protected against fire and the action of fumes or gases by a compound coating consisting of a layer b of asphalt or bitumen, preferably of high melting-point, a layer c of fibrous material, such as asbestos felt, which is impregnated with fire-resisting asphalt, and a layer d of asphalt or bitumen, preferably of high melting-point. The layers b, d may be composed of fire-resisting asphalt. The preferred fire-resisting material is a mixture of asphalt and a chlorinated organic substance of the aromatic series, and the invention includes the general use of compositions of this type for coating metal articles. A convenient fireproofing substance is chlorinated naphthalene. Specification 106,997, [*Class* 95, Paints &c.], is referred to.

194,360. Bailey, A. J., and **Bailey, F. M.** Dec. 3, 1921.

Thermostats. — A fluid-operated valve controlled by a pilot valve operated by a thermostat comprises a casing 1 provided with a valve 2 carrying a piston 3. The cover 6 carries a rod 7, preferably of steel which has a small heat expansion, and the rod carries a fitting 16 which supports a rod 14 of large heat expansion. The lower end of the rod 14 acts as a valve to control the passage 10 admitting pressure fluid to the upper side of the piston 3, to control the main valve. The valve rod 14 may be adjusted vertically by means of worm gearing 17, 18, which may be provided with an indicator. A spring may be provided whereby any expansion of the rod 14 after the valve is closed is taken up by the spring. Alternatively, the rod 14 may be adjusted by a wedge 17, Fig. 3, which is forced between two portions of the rod by means of a screw 17a. The apparatus is adapted for controlling the supply of steam to a vat or drying chamber.

FIG. 3.

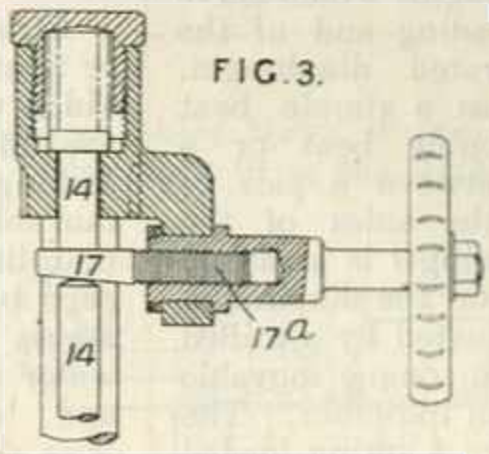
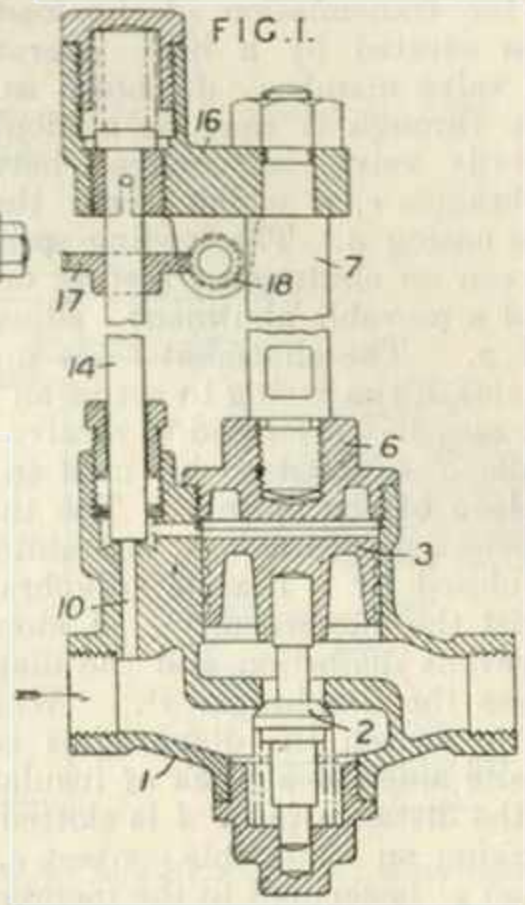


FIG. 1.



194,366. Wingfield, B. R. Dec. 5, 1921.

FIG. 1

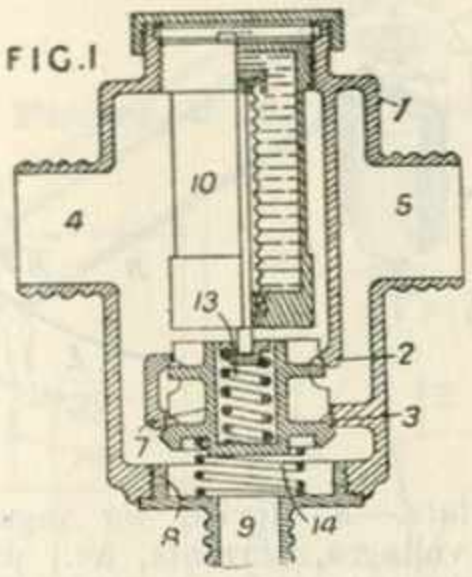
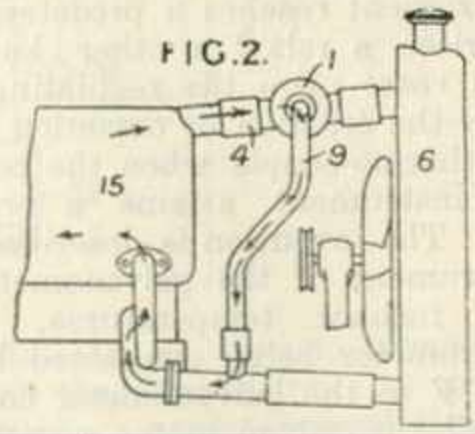


FIG. 2.



Thermostats.—Relates to automatic temperature regulators for use in the water-cooling systems of internal-combustion engines of the type in which an adjustable thermostat 10 and a valve 7 controlled thereby are mounted in a single casing 1 connected between the outlet 4 from the cylinder jacket 15 and the inlet 5 to the radiator 6. The thermostat 10 consists of a closed chamber filled with expansible fluid and is introduced into one end of the housing 1 so as to be capable of screw adjustment, while the valve 7 with a strong safety spring 13 is introduced into the other end of the housing, a light spring 14 maintaining the thermostat and valve in operative contact. In the construction shown, the valve 7 is adapted to bye-pass some or all of the circulating water through a pipe 9 according to the temperature of the water and consists of a double-beat portion contacting with seats 2, 3 to control the amount passing to the radiator, and a single-bent portion contacting with a seat 8 to control the amount passing through the byelpass pipe 9. The bye-pass pipe 9 and single-beat portion of the valve may, however, be dispensed with. Specivcation 19500/10 is referred to.

194,455. Wilkinson, G. Jan. 7, 1922.

FIG 1.

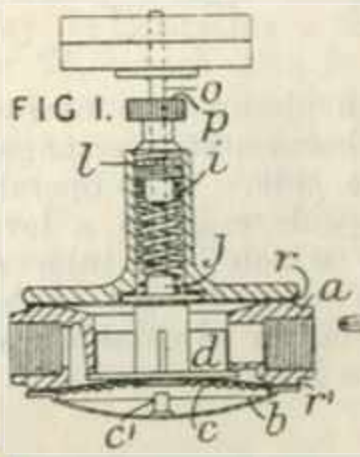
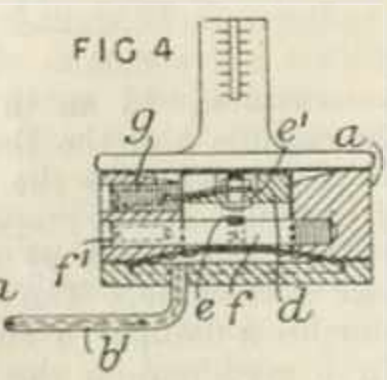


FIG 4

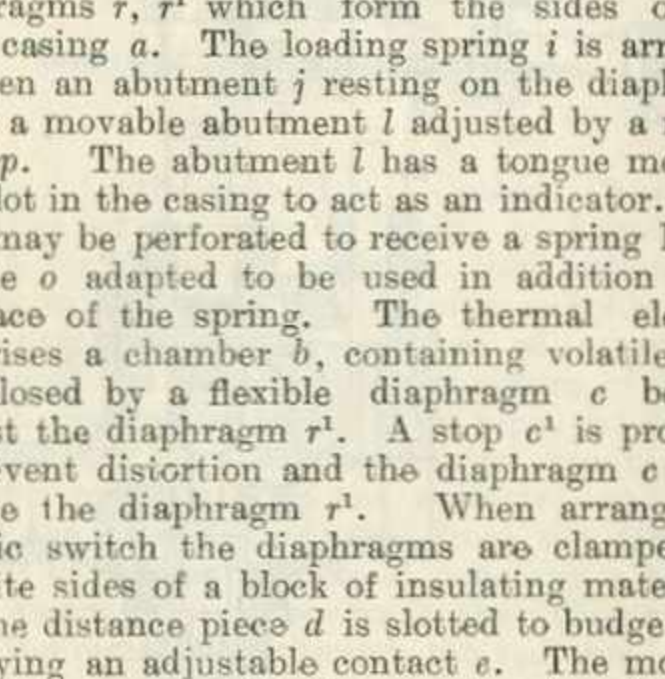


Thermostats.—A thermally-actuated valve or electric switch adapted to limit automatically the amount of heat supplied to the amount required

for any particular purpose has the internal moving element arranged to form a distance piece between a pair of flexible diaphragms which serve for the transmission of the loading and of the force exerted by a heat operated diaphragm. The valve member *d*, shown as a simple beat valve through it may be a double beat or a butterfly valve, is arranged between a pair of diaphragms *r*, r^1 which form the sides of the valve casing *a*. The loading spring *i* is arranged between an abutment *j* resting on the diaphragm *r* and a movable abutment *l* adjusted by a milled head *p*. The abutment *l* has a tongue movable in a slot in the casing to act as an indicator. The head may be perforated to receive a spring loaded spindle *o* adapted to be used in addition to or in place of the spring. The thermal element comprises a chamber *b*, containing volatile fluid and closed by a flexible diaphragm *c* bearing against the diaphragm r^1. A stop c^1 is provided to prevent distortion and the diaphragm *c* may replace the diaphragm r^1. When arranged as electric switch the diaphragms are clamped in opposite sides of a block of insulating material *a* and the distance piece *d* is slotted to budge a rod *f* carrying an adjustable contact *e*. The movable contact e^1 is secured to the member *d* and is connected by a flexible conductor to a plug *g* drilled to receive one leg of a two pronged connector the other limb of which engages a socket f^1. The thermal element may be separate from the control chamber to which it is connected by a pipe b^1.

194,584. West, T. H. April 25, 1922.

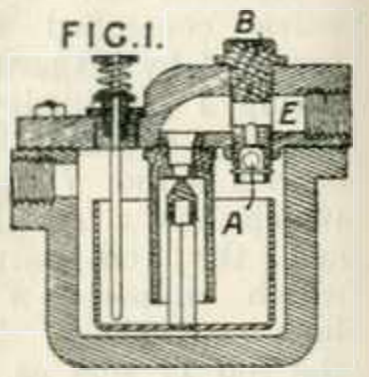
FIG.2.



Thermostats.—In an incubator the carrier *c* for the capsule *a* of the thermostat is arranged as cantilever attached to the side. The operating-rod *j* bearing on the capsule engages a lever *f* pivoted on a flange *d* by which the tube *c* is secured to the side. The lever *f* is bent as shown and carries a damper *h* and an adjustable weight *g*. In a modification the lever *f* operates a gas valve.

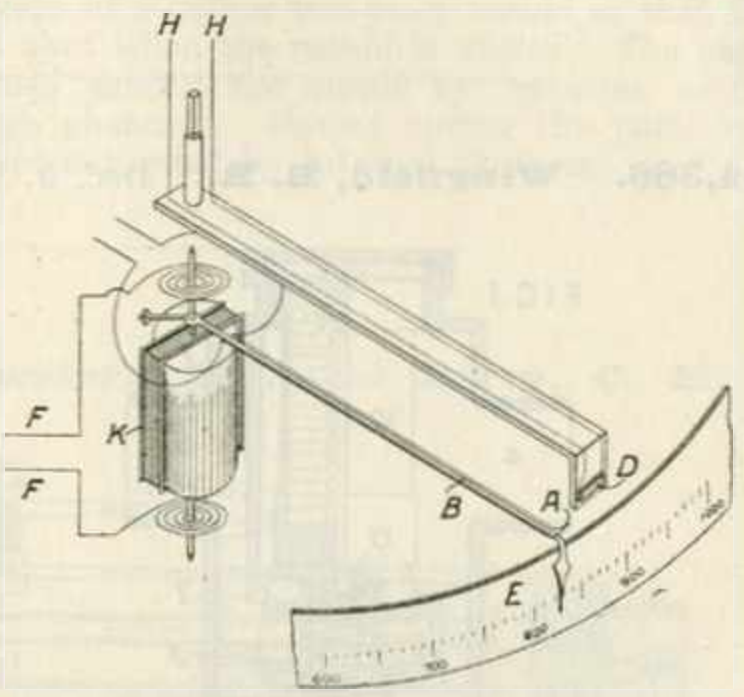
194,588. Cleland, J., and **Stewart, J. C.** April 29, 1922.

FIG.1.



Steam-traps.—A bucket or float steam-trap is provided with an air valve in the form of a cage B containing a loose ball A removable without dismantling the trap, the cage being placed in and across the bore of the water discharge passage E and screwed or otherwise secured to the trap lid so that its bottom end makes a steam tight joint in the wall between the internal steam space of the trap and the water discharge passage.

194,597. Apthorpe, W. H., and **Cambridge & Paul Instrument Co., Ltd.** May 23, 1922.



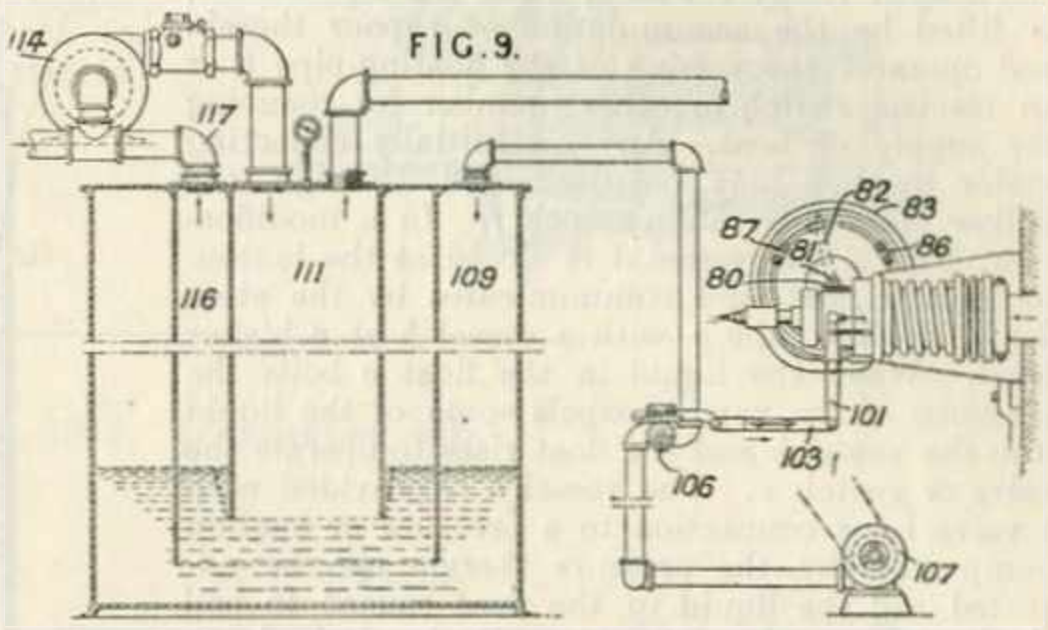
Thermostats.—A device for regulating temperatures, voltages, currents, &c., when a measuring instrument reaches a predetermined reading, comprises a relay or other known device adapted to react upon the regulating apparatus, operated by the creation or cessation of a current through a thermo-couple when the pointer of the measuring instrument attains a predetermined deflection. The invention is described as applied to an instrument of the galvanometer type for measuring furnace temperatures, a thermo-electric pyrometer being connected by the conductors F, F to the galvanometer coil K. The pointer B of the galvanometer carries a thermo-couple A connected to a regulating relay over the leads H, H. A heating element D adjustable along the scale E is continuously heated in any suitable manner, for example, by a source of current, so that when the deflection is such that the couple A is opposite the regulating relay. If desired the thermo-couple may be fixed and the heating element attached to the pointer. According to another modification both may be fixed and a slotted screen attached to the pointer

to shield the couple from the heating source except at a predetermined reading, or alternatively, the couple may be exposed except at a particular reading.

194,688. Zalocostas, D. G., (Assignee of *Sheet Metal Workers, Ltd.*). March 9, 1922, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*].

Thermostats.—An apparatus for controlling the gas supply in accordance with the temperature conditions in a rotary furnace by utilizing the expansion of the furnace comprises a blower 114, Fig. 9, delivering to the innermost chamber 111 of a three-compartment liquid-containing tank, the middle chamber 116 of which is connected to the intake of the blower by the pipe 117, and the outermost 109 to the blower 107 through the three-way valve 106. In normal working conditions the valve 106 is closed, and the pressure of the gas supply is determined by the normal liquid-level in the tank, any surplus gas being returned to the blower through the compartment 116. When the temperature falls below a predetermined point, the valve 106 is operated through the lever 101 and link 103 to connect the compartment 109 to the blower 107, thus increasing the supply-pressure of the gas. On excessive rise of temperature, the valve 106 connects the compartment 109 to the atmosphere and reduces the pressure.

FIG. 9.



194,849. Foster, C. E. Jan. 16, 1922.

FIG. 1.

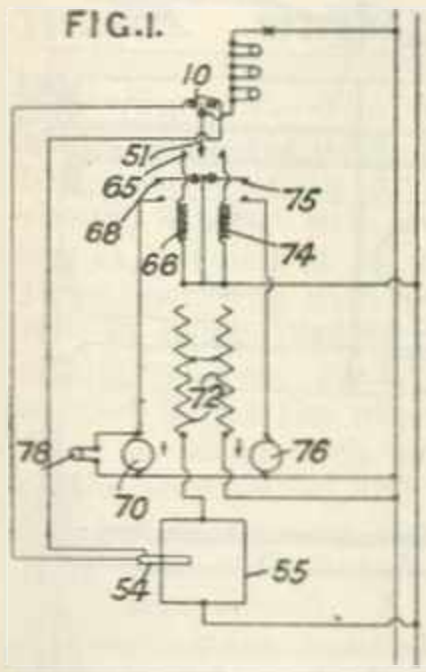
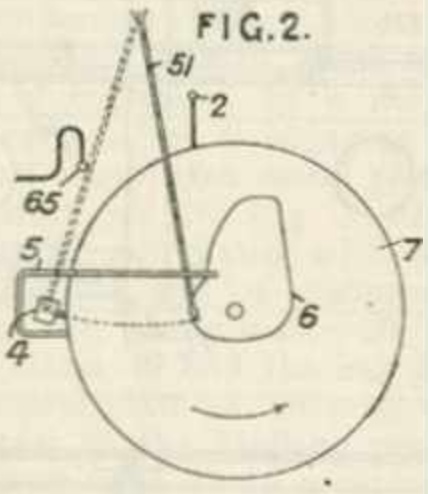


FIG. 2.



Thermostats.—In an electric furnace of the kind in which the temperature is arranged to vary according to a predetermined time-temperature curve, the heating of the furnace 55, Fig. 1, is controlled by a rheostat 72 arranged in the heating circuit and controlled by electric motors 70, 76, the operation of the motor 76 being regulated by a rotary conductive template 6, mounted on a chart 7, Fig. 2, and shaped according to the required time-temperature curve. In co-operation with the template 6 there is arranged a contact-carrying pointer 51 which is alternately swung from side to side by clockwork mechanism and depressed by a bar 5 into contact either with an inking-drum 4 or with the chart 7 and template 6. Each time the pointer 51 is swung over to the left by an operating-arm 2, as shown in dotted lines in Fig. 2, it engages a contact 65 and closes a circuit through a relay 66 which operates a switch 68 controlling the motor 70, this motor acting to increase the resistance 72 and so decrease the furnace temperature. Each time the pointer swings to the right, as shown in full lines, it assumes a position determined by a pyrometer 54 and voltmeter 10 and, when depressed by the arm 5, either engages the conductive template 6 if the temperature is below the predetermined value, or, if the temperature is above the predetermined value, merely makes a record on the chart 7 and completes no circuit. In the former case a circuit is completed through a relay 74 operating a switch 75 controlling the motor 76, which acts to decrease the resistance 72 and increase the furnace temperature. By including a shunt 78 in the circuit of the motor 70, the latter is driven at a less speed than the motor 76, which acts to decrease the resistance required value, the motors 70, 76 are alternately operated, but the movement effected by the motor 76 is the greater and the furnace temperature is gradually increased; if, however, the temperature is above the required value the motor 70 only is operated and the temperature is therefore decreased. If the template 6 is perforated records may also be made on the chart 7 of the periods when the temperature falls below the predetermined value.

195,039. Sandström, G. E. March 15, 1922, [*Convention date*]. *Void* [*Published under Sect. 91 of the Act*].

Thermostats.—An apparatus for regulating the supply of steam, electricity or other heating-medium for heating a liquid contained in a receptacle *a*, Fig. 1, comprises a vertically-movable bell-shaped vessel *c* which, when the liquid boils, is lifted by the accumulation of vapour therein and operates the valve *e* of the heating-pipe *b* or an electric switch or other member for reducing the supply of heat. Any air initially collecting under the bell may be discharged through the hollow stem *d* by an air cock *j*. In a modification, Fig. 2, the vessel *c* is closed at the bottom to form a float and communicates by the stem *d* and flexible tube *g* with a vessel *h* at a higher level. When the liquid in the float *c* boils the pressure of the vapour expels some of the liquid into the vessel *h* and the float rises to operate the valve or switch *e*. The vessel *h* is provided with a valve *i* for connection to a pressure or suction pump whereby the pressure therein can be adjusted asd the liquid in the float caused to boil at the temperature at which it is desired to maintain the contents of the receptacle *a*.

FIG. 1.

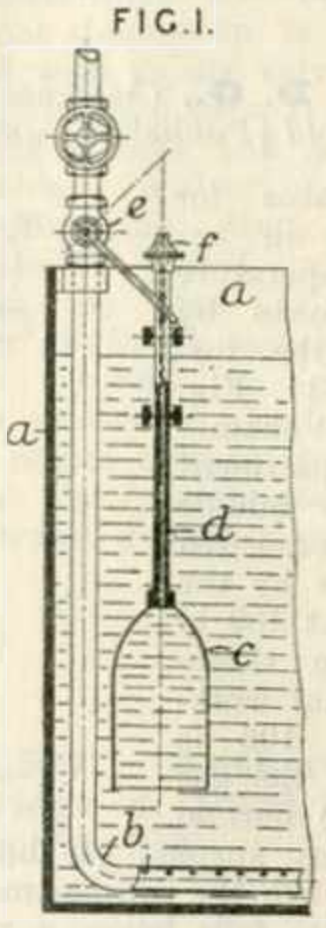
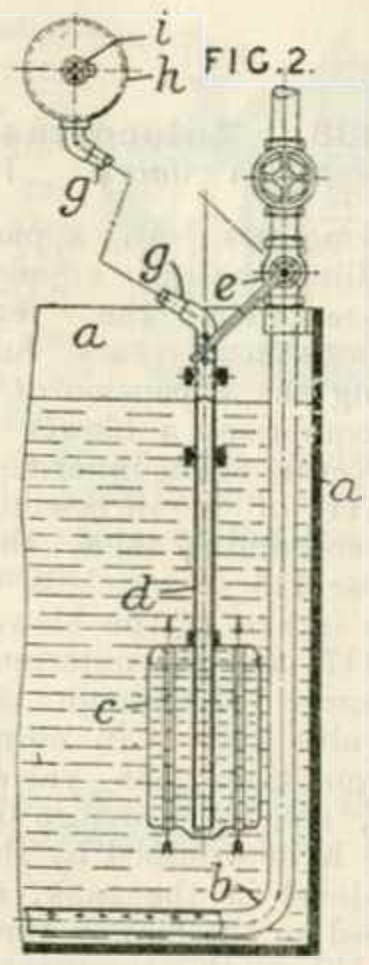


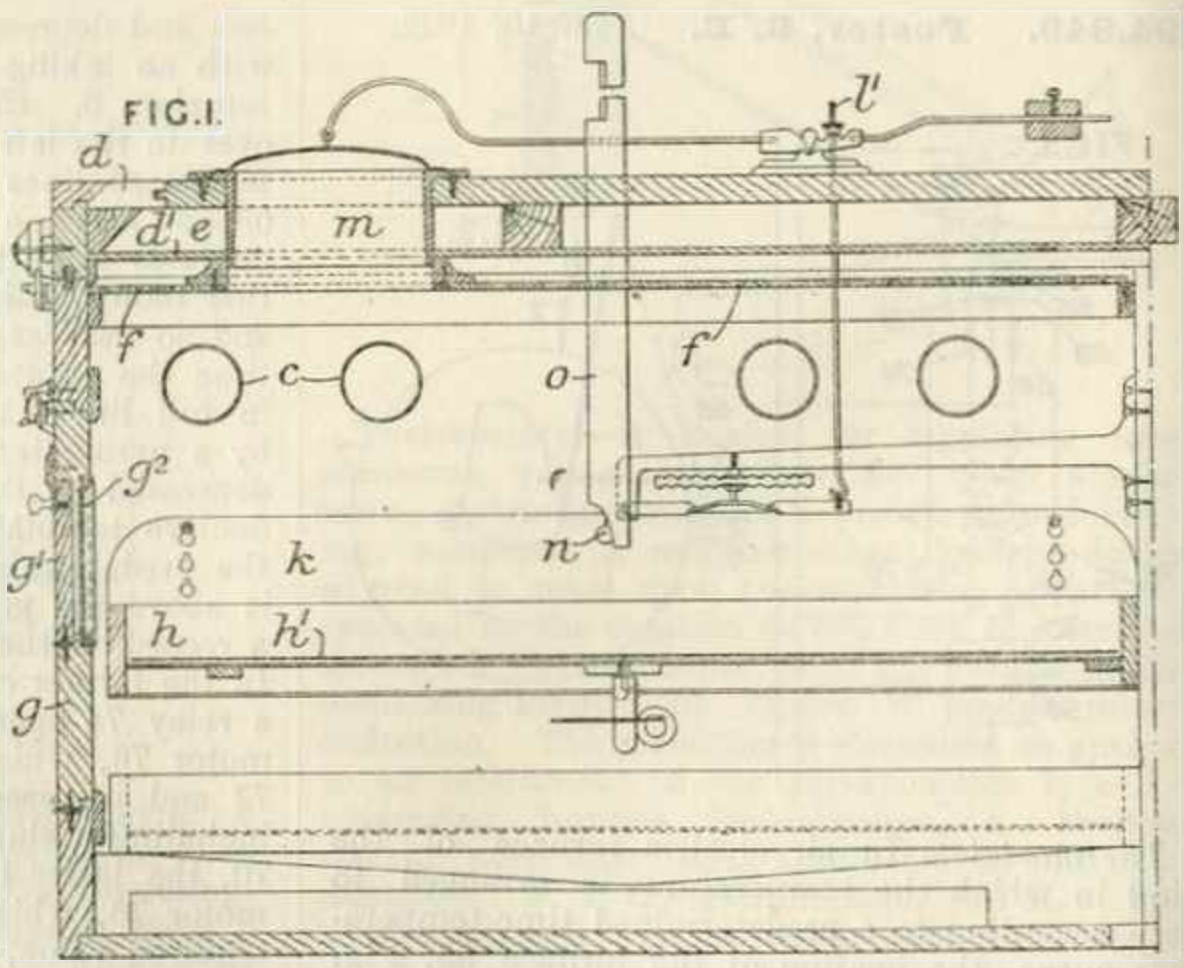
FIG. 2.



195,135. Soole, E. H. Dec. 17, 1921.

Thermostats.—An incubator has a number of compartments heated by water passing through pipes *c*, the temperature of the water being regulated by a main thermostat. Each compartment is also fitted with a damper over the ventilating-aperture *m*, which is controlled by a capsule thermostat l^1, arranged as shown, with a thumb-nut and other parts arranged to facilitate the ready removal of the cover.

FIG. 1.

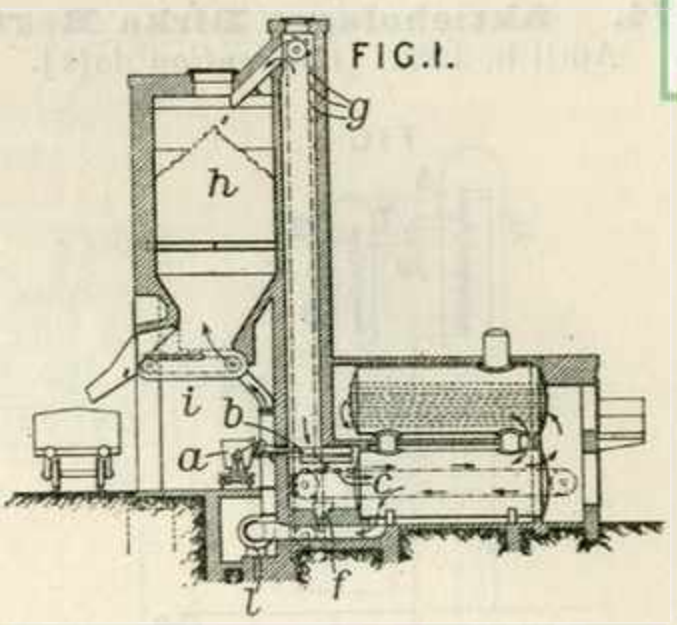


195,267. Kilburn, B. E. D., (*Sulzer Frères Soc. Anon.*). March 23, 1922.

Heating systems and apparatus.—Metal, slag, or the like is cast in a chamber in which a gaseous medium is maintained in circulation over a heat exchanging device. Material to be cast is introduced from a ladle *a* to a pouring device *b* supplying a chain of moulds *c* passing through tubes in the lower drum of a steam generator or

other heat exchanging device. The castings are discharged by a shoot *f* to an elevator *g* delivering to a storage and cooling receptacle *h* discharged by a conveyer *i* to trucks &c. A fan &c. circulates air or other gas through the receptacle *h*, elevator shaft, the tubes in the lower drum, and over the exterior of the two drums back to the fan. The speed of the fan is regulated in accordance with the demand for steam.

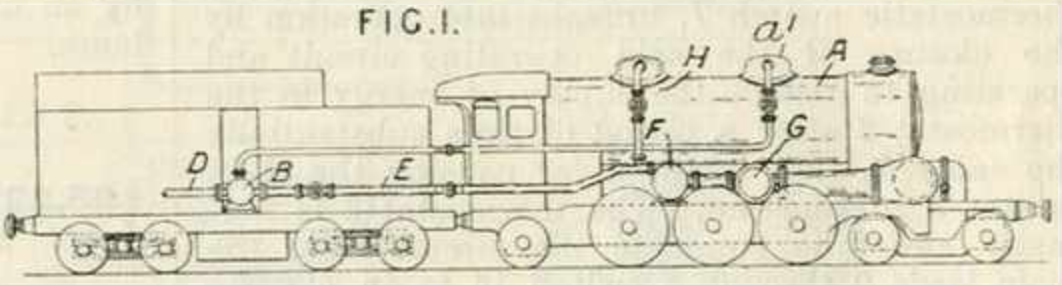
FIG.1.



195,638. Leidenroth, G. April 1, 1922, [*Convention date*].

Heating vehicles.—Steam from the dome a^1 of the main boiler A is used in the turbine B which drives the blower of the condensing-plant, and the exhaust passes either by the pipe D to the train pipe or by the pipe E, augmented by steam from the supplementary boiler H, to the turbine F and condenser G.

FIG.1.



The Specification as open to inspection under Sect. 91 (a) (a) states also that in a modification, the dome a^1 delivers steam direct to the train pipe while the boiler H supplies the steam for the turbine B, and makes good the loss of feed-water due to leakage. This subject-matter does not appear in the Specification as accepted.

195,799. Wilson, A. Jan. 20, 1922.

Thermostats.—The temperature of an electric heater for incubators, brooders, heated cases for birds and animals &c. is controlled by a thermostat 8 fitted with a vertical rod 9 engaging a rod 11, pivoted at 12, and carrying a metal plate 14 co-operating with a third rod 26, Fig. 5, the rod 26 being pivoted at 27 and fitted with an adjusting screw 30 at one end and a platinum contact 31 at the other. An accumulator 20 is fitted in series with an alarm 19 and the bar 11 of the thermostat, the metal plate 14, secured to the bar 11 making contact in the limiting positions with a C-shaped numbered 18 to complete the alarm circuit. A glass fronted box 24, Fig. 5, fitted on the front of the incubator is provided with spring terminals 33, 34 bridges to close the heater circuit, when the door of the incubator is closed, by a metal strip 35 secured to the door. The box 24 also carries a platinum contact 28 and the pivot pin 27 for the rod 26 of the thermostat. When the plug from the mains is inserted in the socket 15 and the door of the incubator is closed, the rod 11 of the thermostat will be in its lowest position and the platinum contacts 28, 31 will be touching to close the circuit. When the temperature reaches a certain point, the rod 11 is raised to a position where the plate 14 secured thereon and tilts the rod 26 to separate the contacts 28, 31 and this breaks the circuit.

FIG.2.

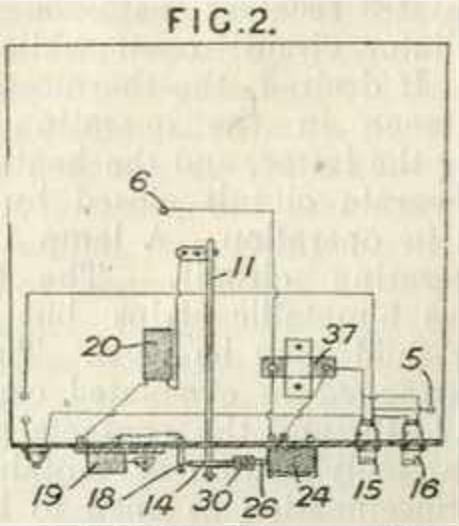


FIG.4.

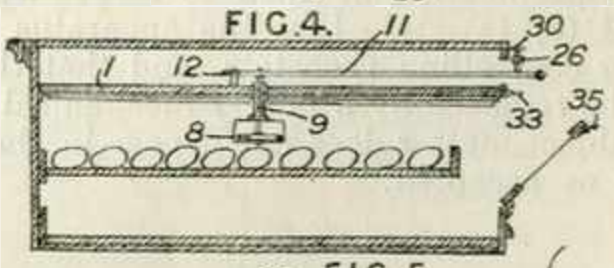
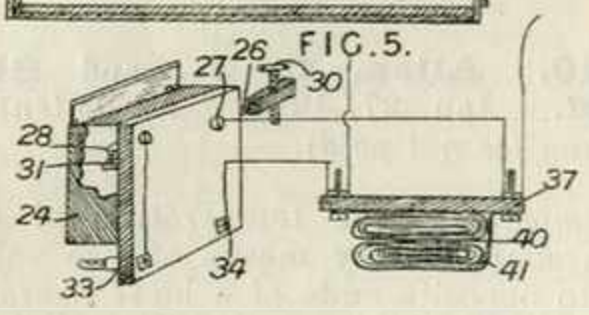
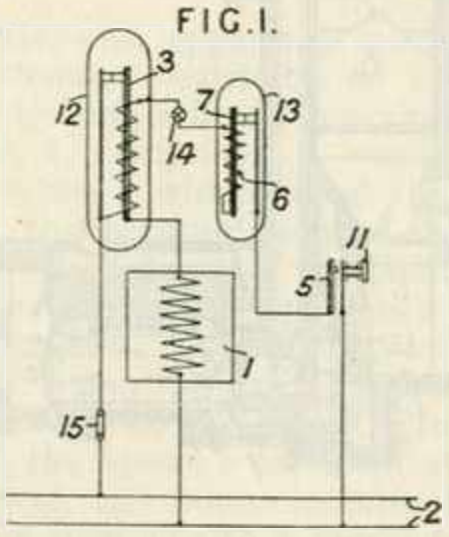


FIG.5.



195,974. Aktiebolaget Birka Regulator. April 6, 1922, [*Convention date*].

FIG. 1.



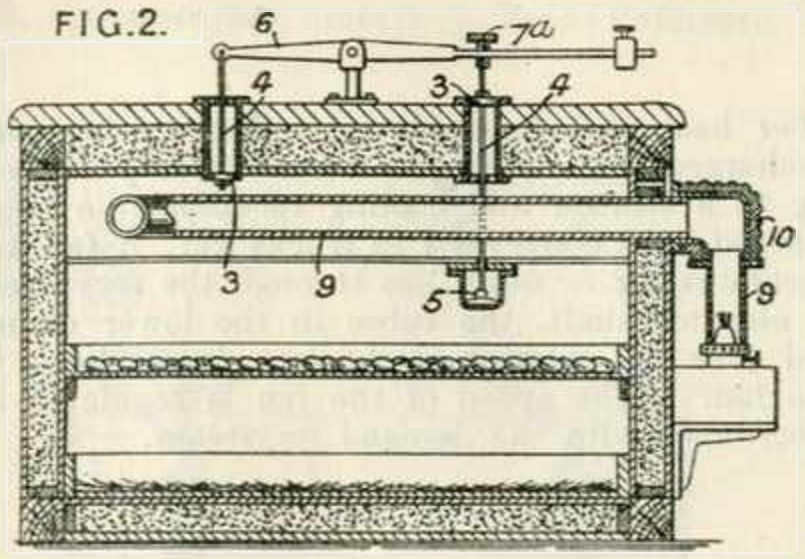
Thermostats.—The operating circuit of an electrically heated thermostat 3 for controlling switches, for regulating current supply to an electric heater or for controlling the admission valves of radiators is controlled by an auxiliary thermostatic switch 7, brought into operation by the closure of the said operating circuit and operating to reduce the supply of energy to the thermostat 3 after a period of time substantially the same as that required for causing the thermostat 3 to function. The thermostat 3 is normally closed to complete the circuit from the main leads 2 through a switch 15 to an electric radiator 1. A thermostatic relay 5, having an adjustable contact 11, normally opens the operating circuit of the thermostat 3. When the temperature of the room heated by the radiator reaches a certain value, the relay 5 closes the operating circuit, so that the thermostat 3 becomes rapidly heated and opens the radiator circuit. The auxiliary thermostat then causes intermittent breaking and making of the operating circuit, the arrangement being such that the thermostat 3 receives just enough energy to keep the radiator circuit open while the relay 5 is closed. If desired, the thermostate 7 may insert a resistance in the operating circuit without breaking the latter, and the heating coil 6 may be in a separate circuit closed by the thermostat 3 when in operation. A lamp 14 is arranged in the operating circuit. The thermostats are shown as bimetallic strips but any expansible solid or fluid may be used. The thermostat 3, 7 are arranged in evacuated or gas-filled receptacles 12, 13, and the contacts are preferably of tungsten, molybdenum or tantalum.

The Specification as open to inspection under Sect. 91 (3) (a) state that the apparatus may be used for controlling rheostats, and that the relay 5 may be replaced by a purely mechanical device. This subject-matter does not appear in the Specification as accepted.

196,119. Allen, C. F., and **Stanton, E. M.** Jan. 27, 1922. *No Patent granted (Sealing fee not paid).*

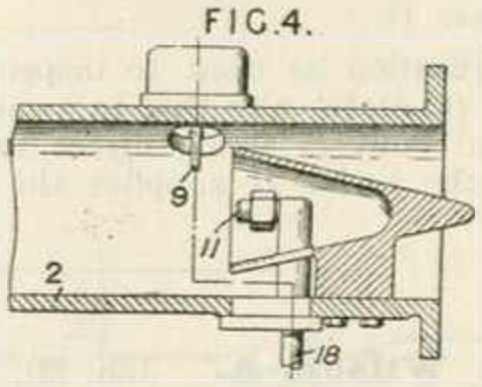
Thermostats.—The temperature of an incubator is controlled by means of two valves connected to opposite ends of a lever operated by a thermostatic device to regulate the admission and discharge of air to and from the egg-chamber. The capsule 5 carries a rod 4 connected through an adjusting screw 7a to a lever 6 to which the valves 3 are connected. The rod 4 may form the stem of one of the valves or a separate rod may be used. The two pipes 9, that lead the hot gases from the lamp to the egg-chamber, are connected by an angle bend 10 to facilitate removal of the lamp.

FIG. 2.



196,223. Scott, L. L. Aug. 28, 1922.

FIG. 4.



Thermostats.—An apparatus for regulating the combustion of fuel in an oil-burning heating-system according to the temperature of the room comprises an electrically-driven motor 31, blower 30 and pump 33, Fig. 1, for projecting air and sprayed oil into a zone of ignition, a sparking-plug 8 for igniting the fuel, a high voltage circuit 106, 107 for driving the motor 31, a low voltage circuit derived from the secondary coil 105 of a transformer 104, an electromagnetically operated switch having an armature 50, Fig. 2, for making and breaking the motor and sparking circuits, and a room thermostat 114 for controlling the two electromagnets A, B of the switch. The fuel is pumped from a reservoir 35 through a pipe 18 to a spray nozzle 11, Fig. 4, arranged adjacent to the sparking-plug 8 in a combustion tube 2, the flame being blows outwards an outlet 3 and a conical flame-spreader with an upper refractory surface 7 in the furnace 1. A thermostat 9, Fig. 3, having leads 21, 27 located in the tube 2, and a movable arm 40 operated by the oil pressure through a Bourdon gauge 37 together control a safety electromagnetic device 95 for the high voltage circuit, the arm 40 normally contacting with a terminal 41 and forming part of the sparking circuit, but contacting with a second terminal 42 in the safety circuit at a predetermined pressure. The electromagnetic switch comprises

FIG. 1.

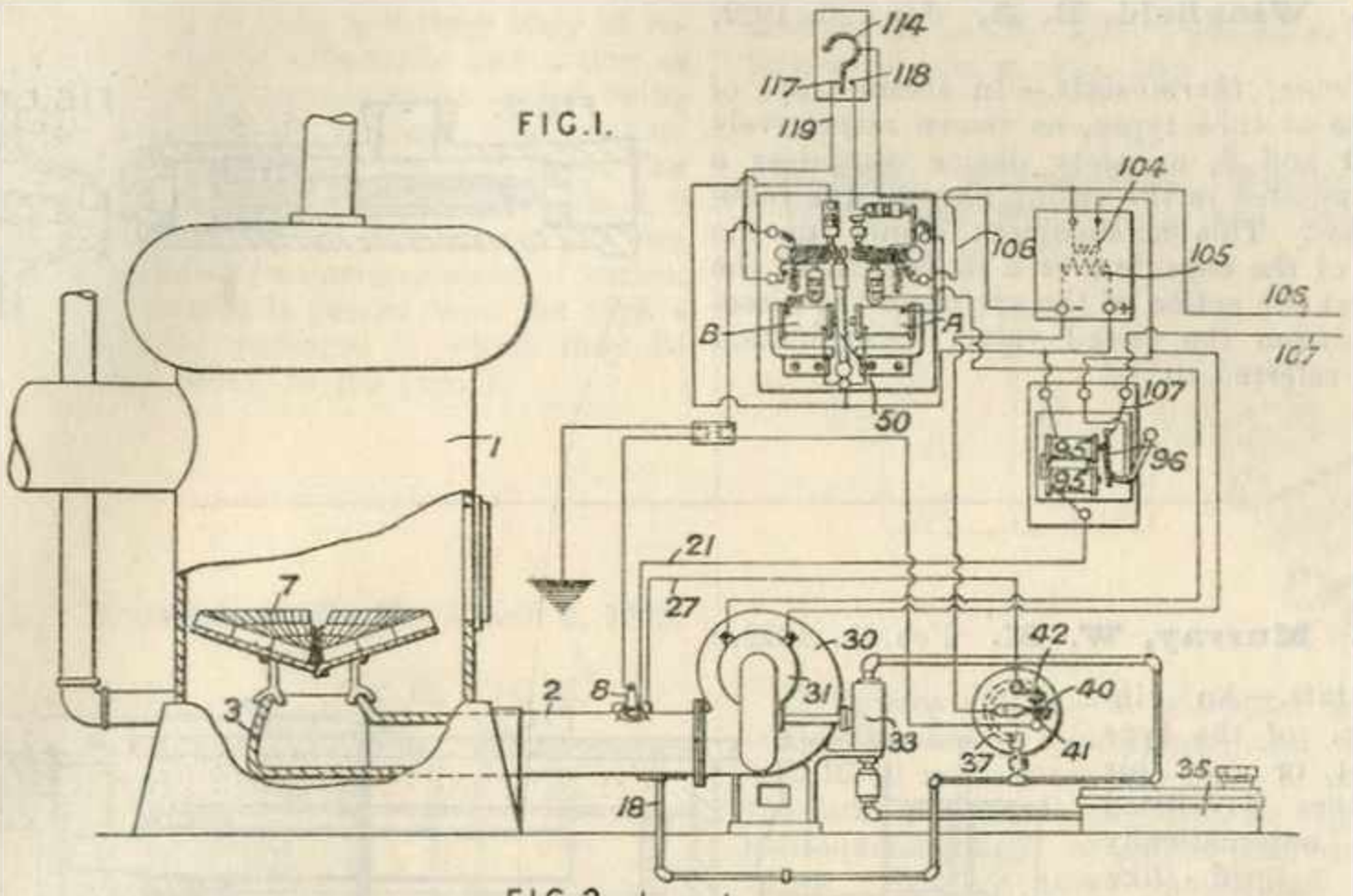


FIG. 2.

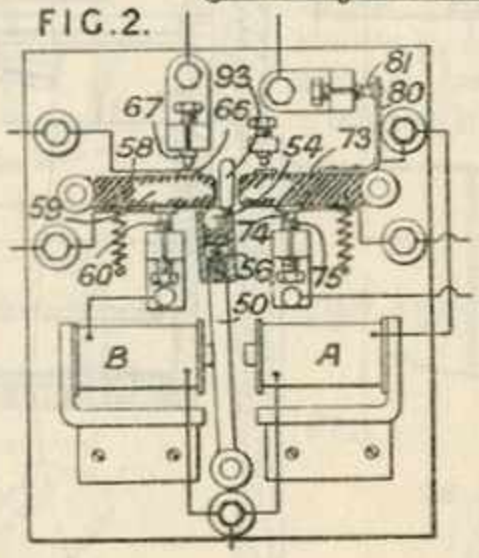
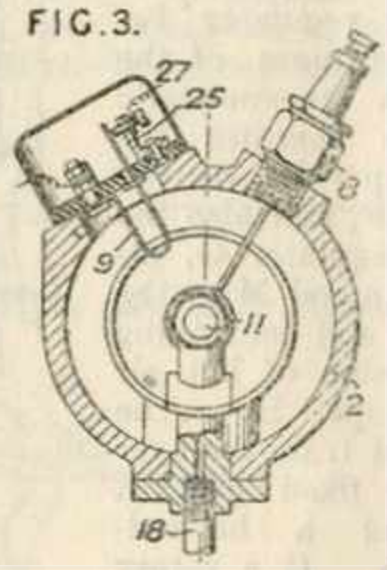


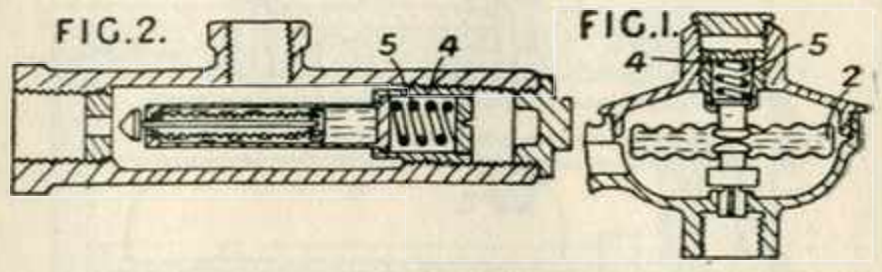
FIG. 3.



two magnets A, B with a pivoted armature 50 having at its free end a spring-pressed ball 54 and co-operating with two pivoted gravity or spring-controlled arms 58, 73 which carry contacts 66, 60, 80, 74 on the upper and lower sides respectively. A fixed bar 93 located between the arms 58, 73 so as to compress the spring 56 controlling the ball as the armature 50 rocks over ensures a more rapid action of the arms 58, 73. When the arm 73 is in its lower position the contacts 74, 75 complete the circuit through the motor 31 from the high voltage terminals 106, 107, this circuit including the armature 96 of the safety device 95, while the contacts 80, 81 at the same time complete the circuit through the magnet A from the low voltage coil 105, provided the room thermostat 114 is in engagement with the high temperature contact 118. Both these circuits are broken when the armature is attracted by the magnet A and the arm 73 thereby raised. The primary coil 104 of the transformer is connected through the armature 96 of the safety device in shunt to the motor circuit. When the arm 58 of the switch is in its lower position the circuit through the magnet B from the low voltage coil 105 is completed through the contacts 59, 60, provided the room thermostat 114 is in engagement with the low temperature contact 117; when the arm 58 is raised this circuit is broken and a circuit from the low voltage coil 105 through the contacts 66, 67 to the sparking-plug circuit is completed. Thus, in operation, should the temperature of the room fall from a higher temperature until the thermostat 114 makes contact 117 the magnet B is energized and draws over the armature 50 which, by lifting the arm 58, breaks the circuit of magnet B and completes the sparking-plug circuit. Simultaneously, the arm 73 drops so as to close the motor circuit and bring the contacts 80, 81 into a " set-ready " position whereby the magnet A will be energized as soon as the room is heated sufficiently to cause the thermostat 114 to make contacts at 118. Combustion proceeds until this contact actually occurs when, the armature 50 being drawn over by the magnet A, the motor and sparking-plug circuits are broken, and the cycle of operations is then repeated. Should the sparking-plug become faulty while the motor is in operation and oil is being sprayed into the combustion tube 2, the thermostat 9 will be cooled and make contact at 25, while the arm 40 will be raised by the oil pressure into engagement with the contact 42, these two contacts when made together completing a circuit through the safety electromagnets 95, operating the armature 96, and so breaking the motor and transformer circuits until the armature 96 is reset by hand.

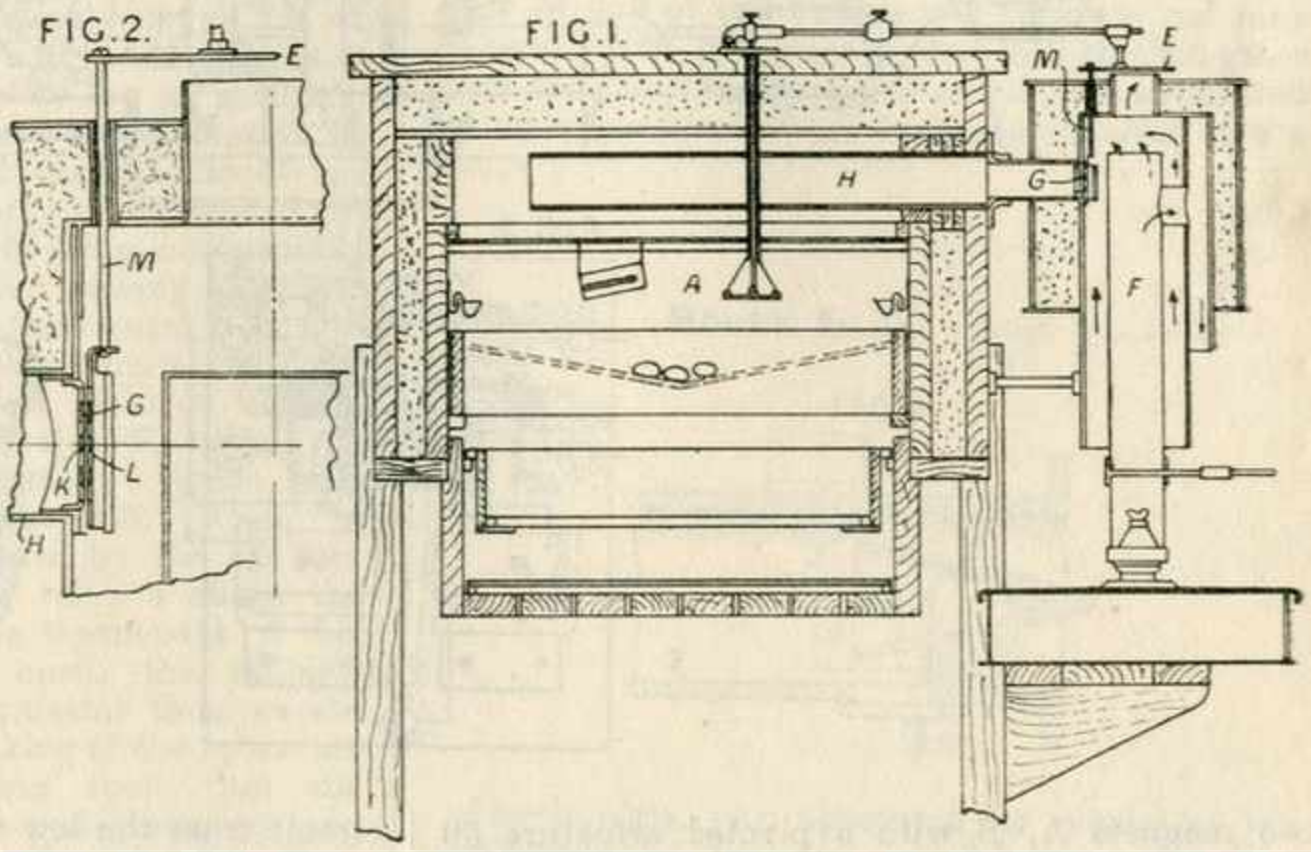
196,395. Wingfield, B. R. Jan. 26, 1922.

Steam traps; thermostats.—In steam traps of the capsule or tube types, as shown respectively in Figs. 1 and 2, a safety device comprises a spring 5 mounted in the casing forming the regulating screw. This arrangement allows for the expansion of the capsule 2 or a movement of the tube against the action of the spring in the direction away from the closed valve. Specification 180,124 is referred to.



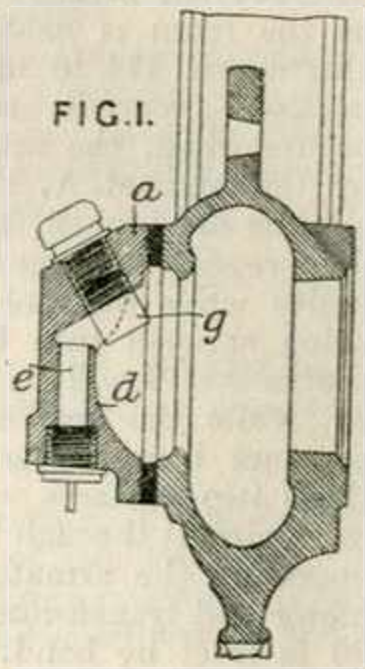
196,407. Murray, W. M. Feb. 1, 1922.

Thermostats.—An incubator &c. of the type having hot or cold air supply pipes is fitted with an automatically controlled grid-like damper or regulator before one or more of the pipes. A thermostatic capsule A operates the usual damper E over the lamp flue F, and also the grid-like regulator G, attached by a rod M to the damper E and controlling the admission of hot air to the pipe H. The sliding grid L moves over a similar fixed grid K constituting a hit-and-miss valve. If a rotary hit-and-miss valve is employed, the rod M carries a rack that gears with teeth on the valve.

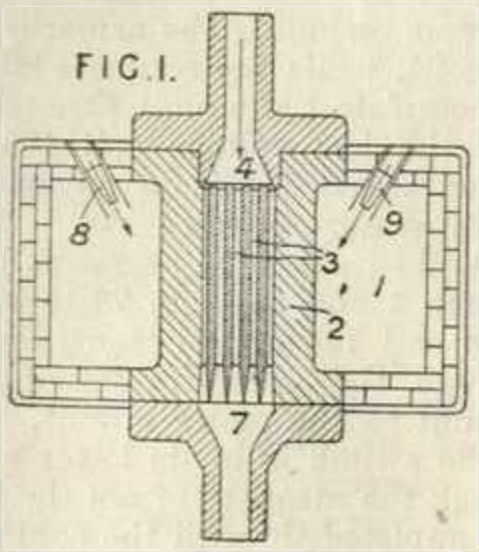


196,520. Radiation, Ltd., and **Ford, F.** June 30, 1922.

Radiators.—A filling-cap *a* for fitting into or over an aperture at the lower end of a gas-heated water-containing radiator is formed with inlet and outlet passages *g*, *e* respectively so disposed that water poured into the inlet *g* is delivered clear of the outlet *e*, while the maximum level of water within the radiator is determined by the upper edge of a lip *d* leading to the outlet *e*.



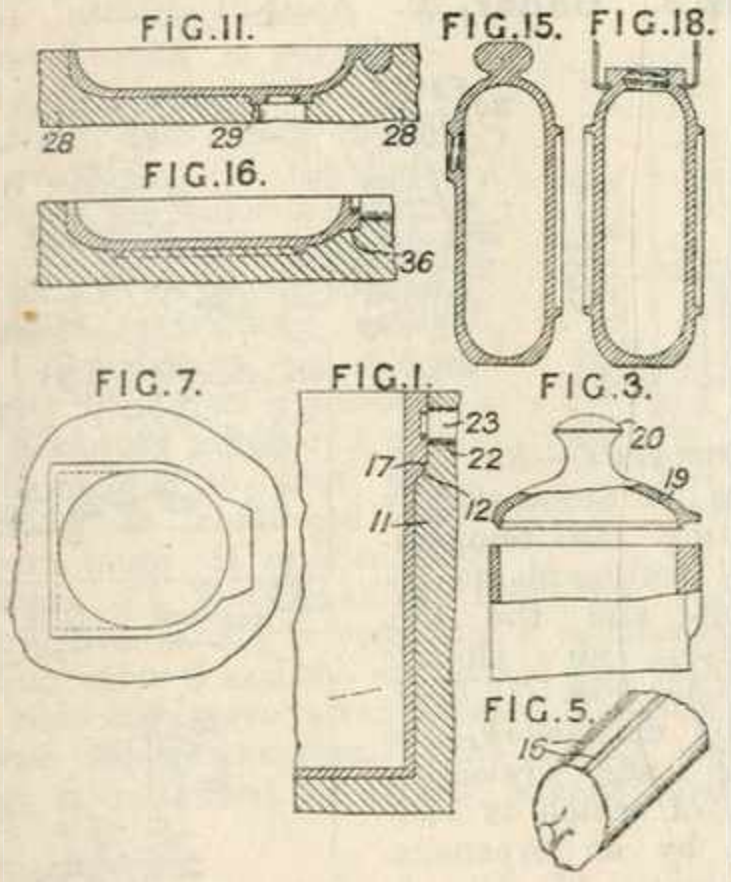
196,662. Metzger, C., and **Lütschen, E.** Jan. 20, 1922.



Solar and natural heat, utilizing.—An apparatus for producing and superheating steam or for heat-

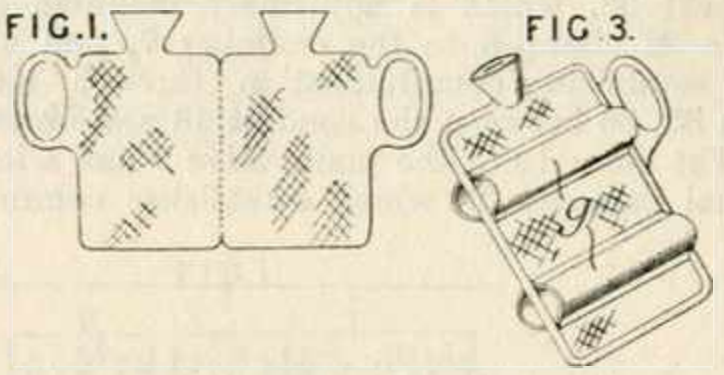
ing flowing gases comprises a unitary body of refractory material heated externally and acting as a heat accumulator, the fluids to be heated being passed with high velocity through straight narrow passages in the centre of the said body. The refractory body 2 is heated externally by jets 8, 9 of vaporized gas, oil or the like, or by the sun through the medium of an arrangement of lenses. The fluid to be heated is passed from the pipe 4 through the narrow passages 3, which may be lined with metal tubes, to the pipe 7.

196,762. Brownlow, R. S. March 3, 1922.



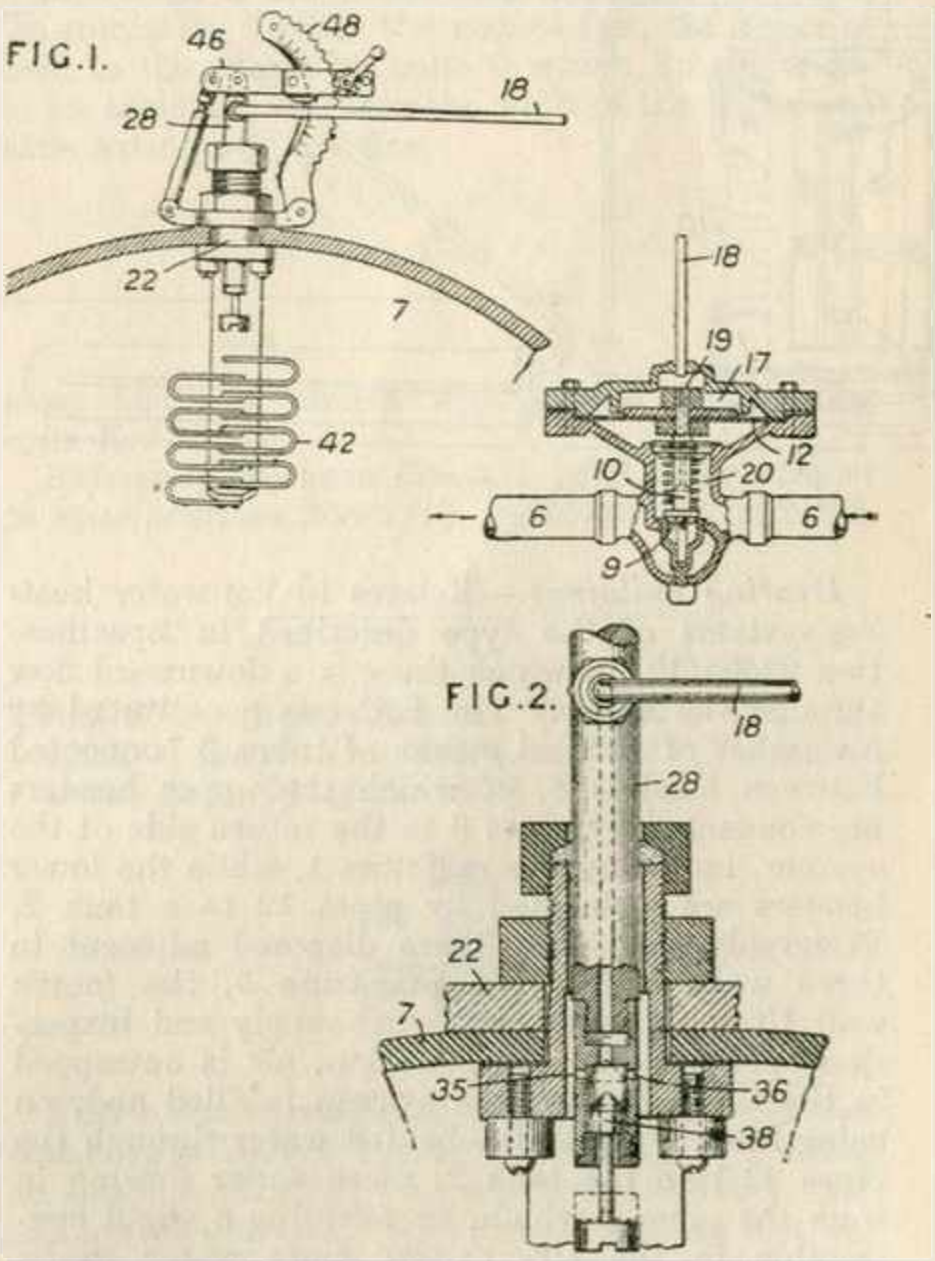
Footwarmers.—Earthenware hot-water bottles and footwarmers are formed in two portions, one or both of which are formed by jollying in a mould furnished with a recess adapted to form a boss through which the filling-aperture is subsequently formed, the recess being arranged to permit withdrawal of the article from the mould. Fig. 1 shows a mould 11 furnished with a recess 12 to form a boss 17, the mould forming the body and one end of the article. An end 19, Fig. 3, furnished with the knob 20 and formed by jollying, pressing or casting, is applied to the body before or after removal from the mould. An aperture 22, Fig. 1, is preferably formed through the wall of the mould 11 for the introduction of tools to form the filling-aperture, the aperture 22 being normally closed by a plug 23. Moulds are described for the production of articles with base ribs 16, Fig. 5, or flat bases. Fig. 7 shows a mould for a **D**-shaped body, the clay at the corners being removed, after jollying, by a cutter. Flat footwarmers are formed of two portions each produced by jollying in a half-mould, one half-mould 28, Fig. 11, being furnished with a recess 29 to produce an article with a side filling-aperture as shown in Fig. 15; or each half-mould may be furnished with a half-recess 36, Fig. 16, to produce an article with a peripheral filling-aperture as shown in Fig. 18.

196,959. Plantation Rubber Manufacturing Co., Ltd., and **Dessau, M. M.** Dec. 5, 1921.



Hot-water bottles.—A hot-water bottle has the body, the filling mouthpiece, and the carrying handle all made from one piece of raw rubber in the form of a blank, as shown in Fig. 1, which is subsequently bent or folded and united at the edges. One or more open-ended tubular elements *g*, Fig. 3, may be applied to form air-ways, and to keep bed-clothes from too close contact with the bottle.

197,127. Collin, G. W. March 14, 1922.

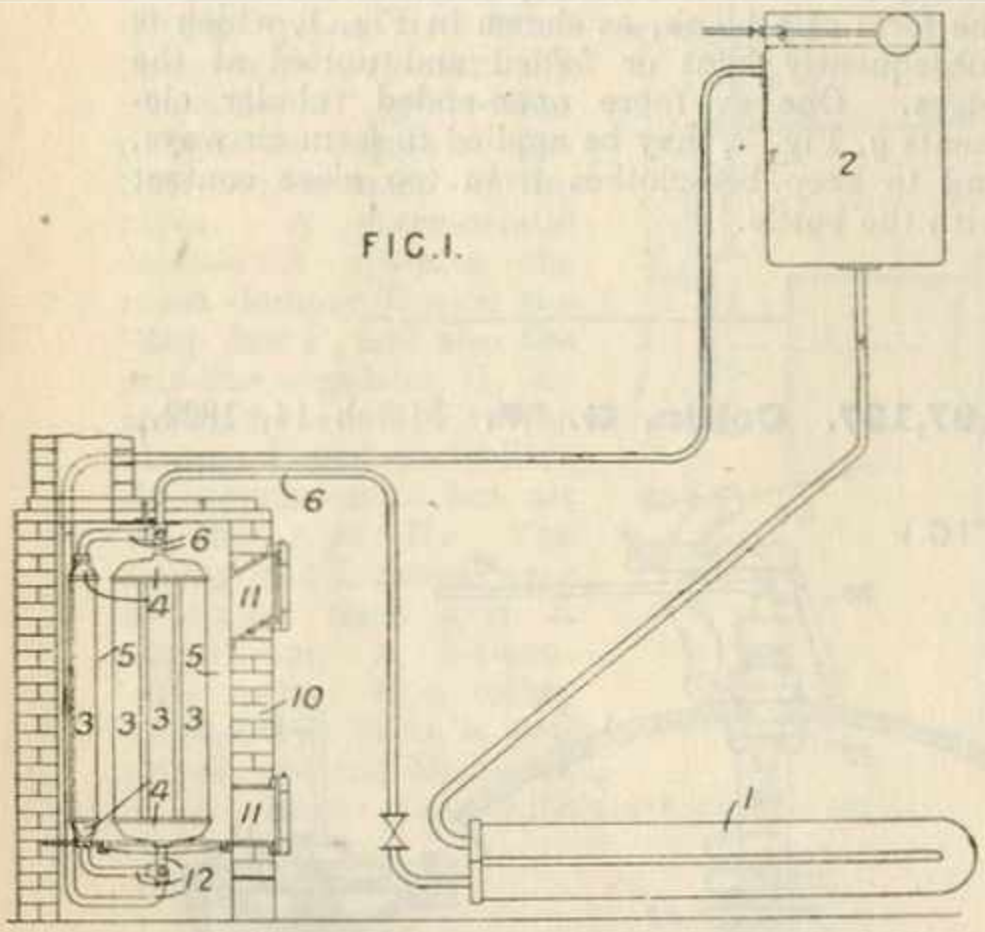


Thermostats.—Relates to thermostats for controlling the supply of heating-fluid through an in-

let pipe 6 to a heating-chamber 7 of the type comprising a diaphragm valve 9 located in the inlet pipe at some distance from the chamber 7 and operated by the pressure of the fluid, a pilot valve 38 controlled by a thermostatic element 42 located in or adjacent to the chamber 7, and a conduit 18 connecting the main and pilot valves. The pilot valve 38 is slidably arranged in a tubular post 28, which is adjustably mounted in a sleeve 22 clamped to the chamber 7, and when open establishes communication through lateral ports 35, 36 between the conduit 18 and chamber 7. The stem 10 of the main valve 9 has a longitudinal passages 19 which establishes communication between a chamber 20 on the under side of the diaphragm 12 and an upper chamber 17. With the pilot valve open, the normally greater fluid pressure on the under side of the diaphragm 12 keeps the valve 9 open; when, however, the temperature in the chamber 7 rises to the predetermined value, the thermostat 42 closes the pilot valve 38, thus causing a gradual increase of pressure in the chamber 17 and effecting a closure of the main valve 9. The position of the post 28 is adjusted by means of a pivoted arm 46 co-operating with a notched pivoted quadrant arm 48.

197,228. Ferguson, J. J. June 28, 1922.

FIG. 1.



Heating buildings.—Relates to hot-water heating-systems of the type described in Specification 22594/12, in which there is a downward flow through the boiler. The boiler is constituted by a number of vertical stacks of tubes 3 connected between headers 4, of which the upper headers are connected by pipes 6 to the return side of the system, including the radiators 1, while the lower headers are connected by pipes 12 to a tank 2. Preferably the tubes 3 are disposed adjacent to three walls of the fire magazine 5, the fourth wall 10 being fitted with fuel-supply and inspection openings 11. In operation, air is entrapped in the tubes 3 when the system is filled and, on being heated, forces the heated water through the pipes 12 into the tank 2, more water flowing in from the pipes 6 which, by effecting a slight contraction in the air, causes more water to be drawn in. This water is heated in the tubes 3, and the series of operations is repeated.

197,513. Bader, T. April 21, 1922.

FIG. 4.

FIG. 1.

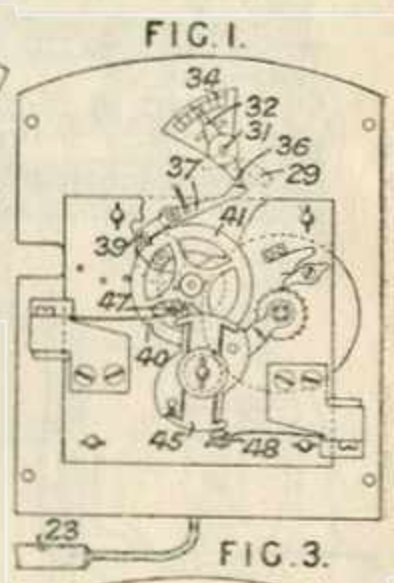
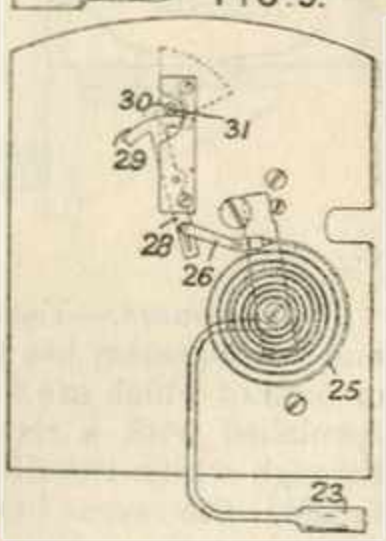


FIG. 3.



Thermostats.—An apparatus for automatically regulating the temperature of heating-plants, incubators and the like comprises an electric switch 45, Fig. 1, operated by clock-work, the locking and releasing means of which is controlled by an expansion thermometer 25, Fig. 3, through the medium of links, levers, or like wholly mechanical means. The rotation of the switch 45 through successive steps of 90° so as alternately to make and break the main circuit is controlled by a clockwork-driven wheel 41 having a series of notches 40 which are engaged by a pawl 39 mounted on one end of a lever 37 which is actuated by the lower end 36, Fig. 4, of a temperature-setting pointer 32 adjustably clamped on a spindle 31 in front of a temperature scale 34. The movements of the spindle 31 and pointer 32 are controlled through the medium of a pinion 30, toothed sector 29, lever 28 and link 26 by the expansion thermometer 25, which consists in known manner of a spiral capillary tube connected to a mercury container 23. When the temperature reaches a predetermined maximum, the end 36 of the pointer acts on one inclined surface 49 of the lever 37 and releases the pawl 39, thus allowing the wheel 41 to rotate until the pawl engages the succeeding notch 40 and so breaking the main circuit at the contacts 47, 48. The circuit is re-established when the tempera-

ture has fallen sufficiently to cause the end 36 of the pointer to engage the opposite incline 50. In the case of electric heating, the switch 45 may be arranged directly in the heating circuit, or, in the case of heating by other means, it may control a motor operating a valve. The inclines 49, 50 are preferably of different angularity to compensate for the variable force exerted by the spiral 25 in expansion and contraction, and the pointer 32 is mounted so that its weight prevents it from lodging on the highest point of the inclines.

197,961. Irle, R. A. May 20, 1922, [*Convention date*].

Heating vehicles. — A system of heating by water circulation, particularly for postal cars, comprises a boiler A with circuit B - - F of large colume. The upper part of the circuit is covered with a partial-insulating jacket G. At starting, and before energy is available from the locomotive, the boiler is heated by a furnace J. As soon as steam or electricity is available, the steam acting on a piston M or electricity acting on a solenoid N causes an air door K and a damper L to shut, and heating is continued by steam pipes H or electric heaters I. The heating may be regulated through a handle X operating a resistance R or steam valve O and the air door K and damper L. A reducing valve arrangement T adjusts the steam supply pressure. The ashpit door P, Fig. 2, is locked as shown, except when the dampers K, L are closed and the fire shut down. To minimize further the risk of fire, the boiler is held to the ashpit by bolts Q which, in the event of an accident, will tear the walls of the boiler and thus extinguish the fire.

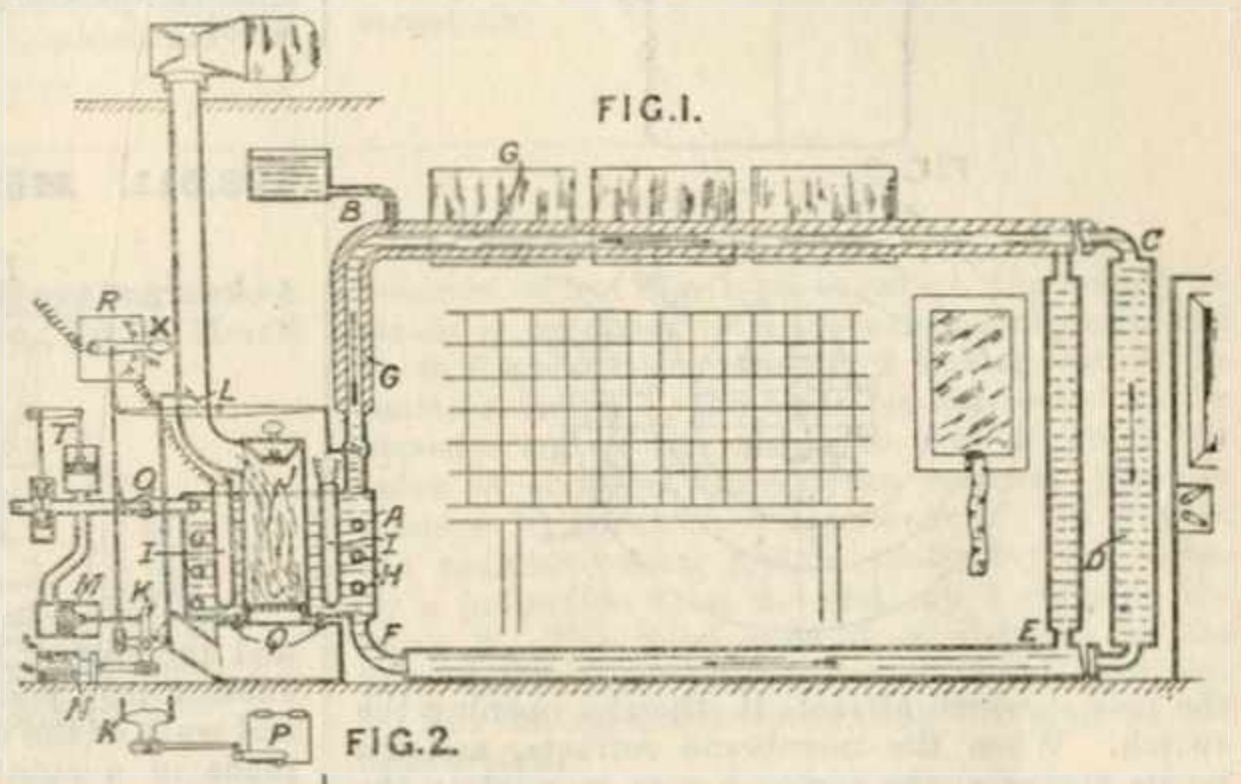
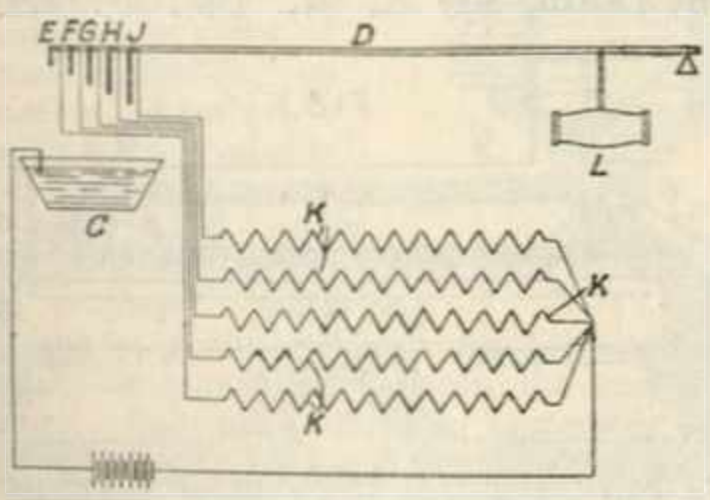


FIG.2.

198,016. Trott, A. J., and **Weight, E. L. J.** Feb. 17, 1922.



Thermostats.—An electrically-heated incubator is fitted with several heating-coils connected in parallel and controlled by a switch operated by a thermostatic capsule &c. so as to cut out the heating-coils successively as the temperature rises. The switch may consist of a mercury trough C into which dip contact-pieces E, F, G, H, J attached in a step-like arrangement to a lever D operated by a capsule L, each contact-piece being in circuit with one of the heating coils K.

Reference has been directed by the Comptroller to Specifications 26831/13, 26835/13 *and* 2012/15.

198,367. Soc. Anon. Calor. May 29, 1922, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Act*]

FIG.2.

Thermostats combined with electric switches comprise a permanent or electromagnet *j* acting in opposite directions on a soft iron lever *e*, articulated at one end *f* and carrying at its free end a contact *k* which engages a fixed contact *l*. The lever *e* is acted on by a rod *d* actuated by a membrane *b* through springs *h*, h^1 and adjustable

Excess temperature acts on the membrane b to raise the rod d and stress the lower spring h^1, and at a given temperature the lever e is forced away from the pole j^{11} into the field of

FIG. 1.

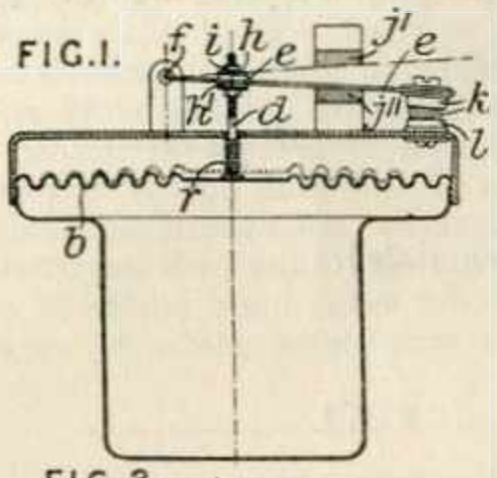
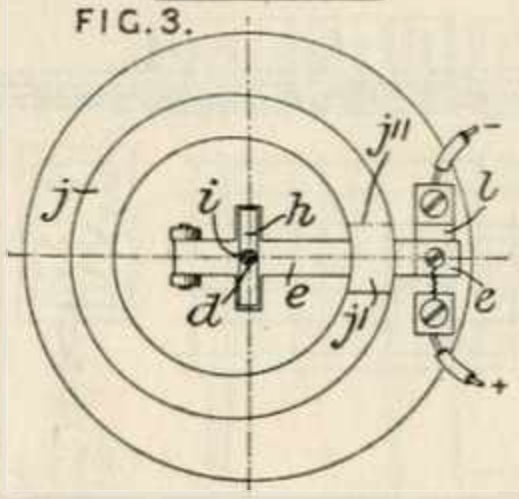


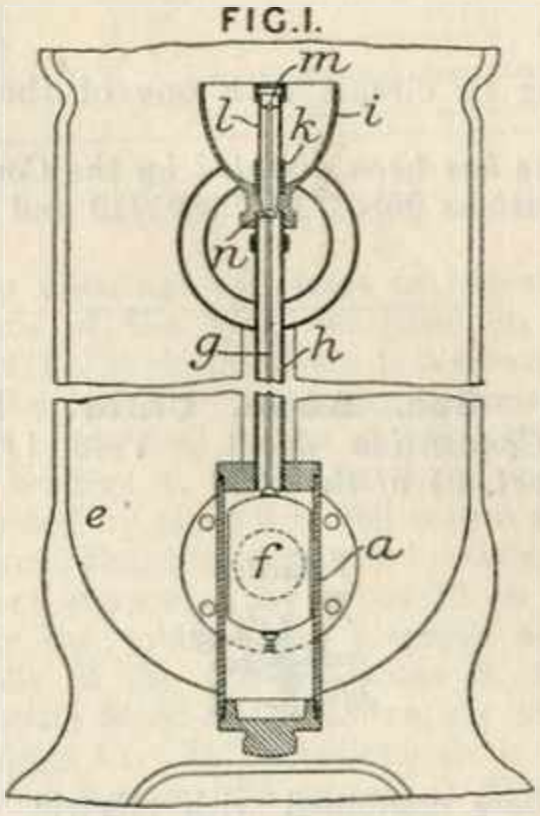
FIG. 3.



the pole j^1 which attracts it, thereby opening the switch. When the membrane retracts, assisted by its spring r, the spring h acts to re-close the switch in a similar way.

198,550. Gibb, D. M., and **Parkinson Stove Co., Ltd.** May 22, 1922.

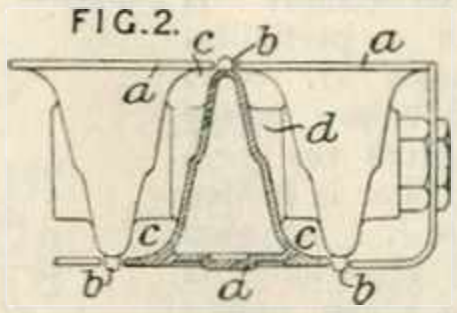
FIG. 1.



Radiators for heating buildings &c., particularly of the type containing water and heated by gas, are provided with a float chamber a in communication with the interior of the radiator e and enclosing a float f with which is combined readily-inspected means for indicating the level of water in the radiator. As shown, a vertical rod g attached to the float f and surrounded by a tube h carries at its upper end a coloured indicating disc m movable within a gauge glass l preferably mounted in a socket k of the filler-cup i. The rod g preferably carries a valve n and the socket k has lateral apertures so that, when a quantity of water has been poured into the filler-cup i and the gauge glass l has been removed, water may flow into the radiator through the tube h until a desired level is attained, at which stage the valve n will close and prevent further admission of the water.

198,611. Möller, V. F. Oct. 16, 1922.

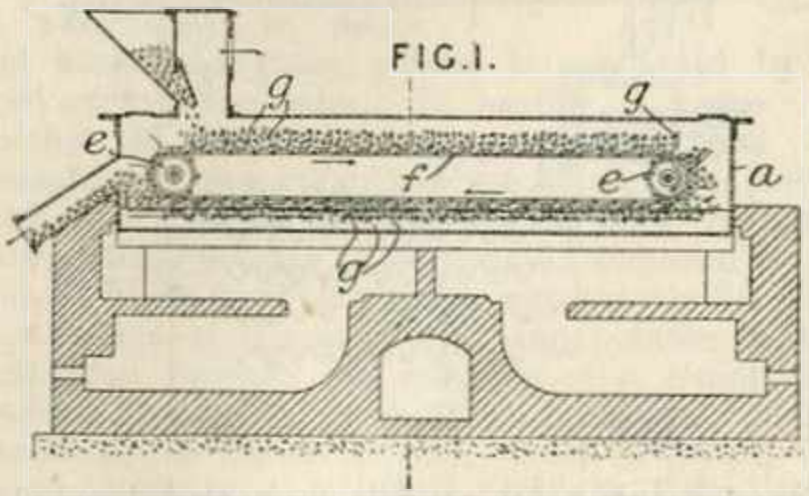
FIG. 2.



Radiators.—In a radiator for heating buildings and the like of the kind having continuous and substantially plane side walls formed by the plane end walls of the individual elements, the latter are made of a substantially triangular cross-section and are disposed so that the apex b of each element lies between the bases a of the two adjacent elements. The sides of the triangular elements are curved inwardly so as to form a series of air channels c between them, the usual connecting-pieces d being provided between the elements. Each unit may be formed integrally with a supporting foot and with an upper projection for supporting a cover-plate.

198,625. Thermal Industrial & Chemical (T.I.C.) Research Co., Ltd., and **Duckham, Sir A. M.** Dec. 30, 1922.

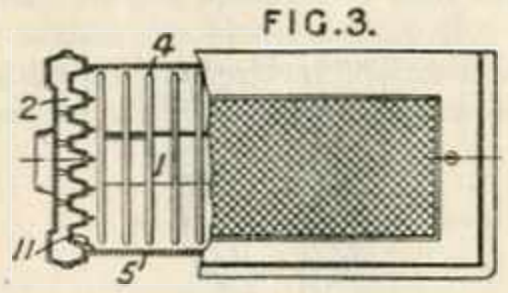
FIG. 1.



Heating-apparatus.—In apparatus for heating materials in a bath of molten metal, a conveyer chain f with retaining plates g is so mounted on sprockets e that the lower run of the chain is just above the surface of the molten metal in the bath a. Side ledges take the weight of the upper run of the chain and the upward thrust of the lower run.

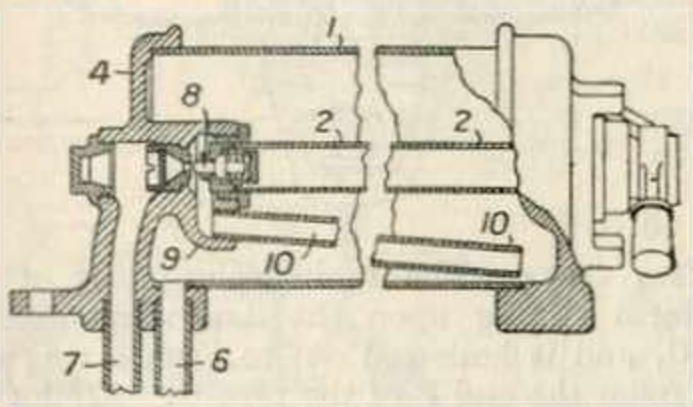
198,646. Courtot, L. May 30, 1922, [*Convention date*].

FIG.3.



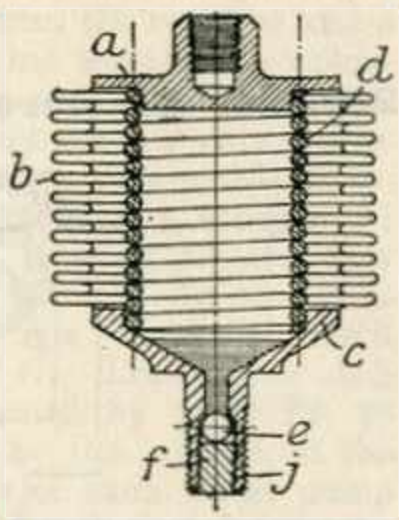
Radiators are constructed with strong sections 2 at the ends, with a body part 1, which may be of light construction, between. Protecting plates 4, 5, cover this body and are fixed by means of suitable ribs 11 to the end sections, and are in some cases detachable. When the radiator is fixed against a wall, the inner plate may be polished on its inside surface and covered with non-conducting material outside. The edges of the sections 2 preferably project beyond the plates 4, 5. A perforated top is secured over the radiator, and the holes may be arranged at a distance from the wall. Deflecting plates may be fitted at the top of the radiator and also below, if an inlet is provided through the wall for external air.

198,787. Barty, T., and **Westinghouse Brake & Saxby Signal Co., Ltd.** March 10, 1922.



Radiators.—In a radiator for heating railway vehicles &c. of the type in which the supply of steam is regulated by a thermostatically operated valve 8 and control member 2 located within the radiator casing 1, the steam is conducted to the opposite end of the casing to that at which the valve is arranged through an internal pipe or passage 10 which is independent of the wall of the radiator casing and is preferably supported by a projection 9 on the end cap 4 carrying the valve 8. The oulet pipe 6 is disposed at the same end as and closely adjacent to the inlet pipe 7, this arrangement preventing freezing of the outlet pipe.

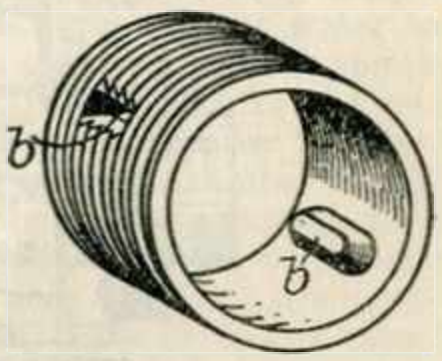
199,089. Oliver, A. V. March 10, 1922.



Thermostats.—In a thermostatic device for controlling the temperature of the cooling water for an internal-combustion engine or for similar purposes of the kind comprising an expansible chamber *b* containing a volatile liquid, the chamber is only partly filled with the liquid, e.g. water, under reduced pressure, and a spring *d* is arranged to act either internally or externally between the ends of the chamber. One end plate *a* is preferably tapped for attachment to a fixed support, while the other end plate *c* is conical and terminates in a hollow spigot *j* connected to the valve or other member to be controlled. A ball *e* and sealing-plug *f* are inserted in the spigot *j* after a small quantity of the liquid has been introduced into the chamber *b* and heated to boiling-point so as to expel air. The thermostat may be used to control the flow of water between an internal-combustion engine and a radiator, or to control the extent of opening of shutters arranged in front of a motor-car radiator.

199,372. Böttiger & Co. June 15, 1922, [*Convention date*].

FIG.1.



Radiators.—Radiator nipples having internal lugs *b* serving as abutments for a tool are made by first pressing the lugs in band iron and then rolling to tubular form and welding the edges. The external hollows are preferably filled by welding, and the thread is then cut.

199,725. Courtot, L. June 24, 1922, [*Convention date*].

Radiators.—Each section of a radiator for heating building is built up of a number of thin tubes 1 of small diameter connected between two annular chambers 2 and bent near their extremities so as to terminate in a direction perpendicular to the chambers, each section being formed in one piece, preferably by electrolytic deposition upon a fusible core. The annular chambers are flanged out-