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. 1926-30 [244,801—340,200]

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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. For further information as to the classification of the subject matter of inventions, reference should be made to the *Abridgment-Class and Index Key* (*Vol. I*), published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2, price 7s. 6d. (inland); 8s. 1d. (abroad).

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 may be purchased from the Patent Office at the uniform price of 1s. (inland); 1s. 1d. (abroad).

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 11/33].

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Heating systems and apparatus, Miscellaneous.

This heading includes only those systems or apparatus for which no specific provision exists in other Key headings.

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CLASS 64 (ii)

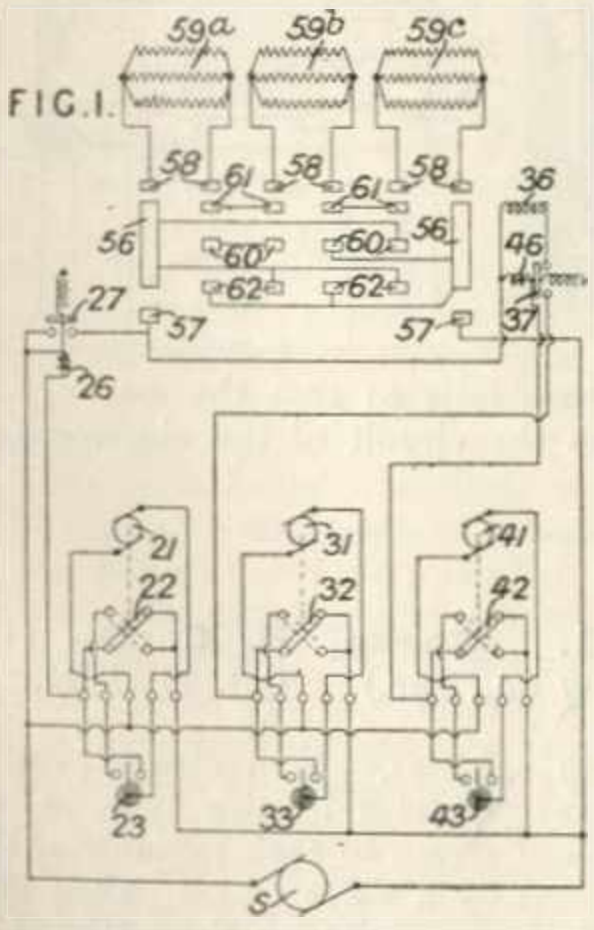
HEATING SYSTEMS AND APPARATUS

[*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.

244,808. Law, J. A., (*Hudson, W. E.*). Aug. 14, 1924.

FIG. 1.



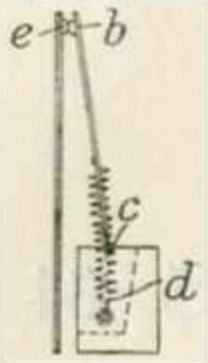
Thermostats. — Relates to an electric room-heating apparatus comprising separate coils or sets of coils 59^a, 59^b, and 59^c provided with thermostatic means for connecting the coils in different mutual relationships. The coils or heaters are fitted to a boiler connected to a hot-water radiator system and are supplied with current by a source S of constant voltage. The control is effected by three thermostats 23, 33, 43 which are responsive to the temperatures of the room, the water in the boiler, and the outside atmosphere respectively. The thermostats 23, 33, 43 control the circuits of solenoids 26, 36, 46 through the medium of motors 21, 31, 41 and snap-switches 22, 32, 42. The solenoid 26 controls a switch 27 in the main circuit and the solenoids 36, 46 are fitted to the arms of a rotary switch to which the heaters are connected. The solenoid 46 is also adapted to operate a circuit-breaker 37 so that the boiler thermostat is ineffective when the solenoid 46 is energized. The rotary switch is provided with contacts 56, 60, 61, 62, and brushes 57, 58 and is normally held in the mid-position with brushes 58 engaging contacts 60. In this position the heaters 59^a, 59^b, are in series with one another and in parallel with the heater 59^c. When energized the solenoids 36, 46 operate the switch to bring the contacts 61 or 62 into engagement with the brushes with a consequent connection of the heaters in series or parallel

590. Wt. 129/1616. 3/30. C.P.Leam. Ps. 2352.

245,150. Deutsche Gasgluhlicht-Auer-Ges. Dec. 24, 1924, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

Thermostats. — A bimetallic strip for use in a thermal switch carries a contact *e* which when the strip is heated, bears against a contact on the operating arm *b* of the tumbler switch, moving the arm about a pivot *c* and a spring *d* over dead-centres to cause a quick break. The strip may carry an extension member to return the switch to its "on" position or the strip may be longitudinally split and arranged so that one part will move the switch "off" and the other "on" or the switch may be moved "on" by a press button. Several bimetallic strips may be combined together so as to cause a bigger displacement of the operating portion for a given change of temperature.

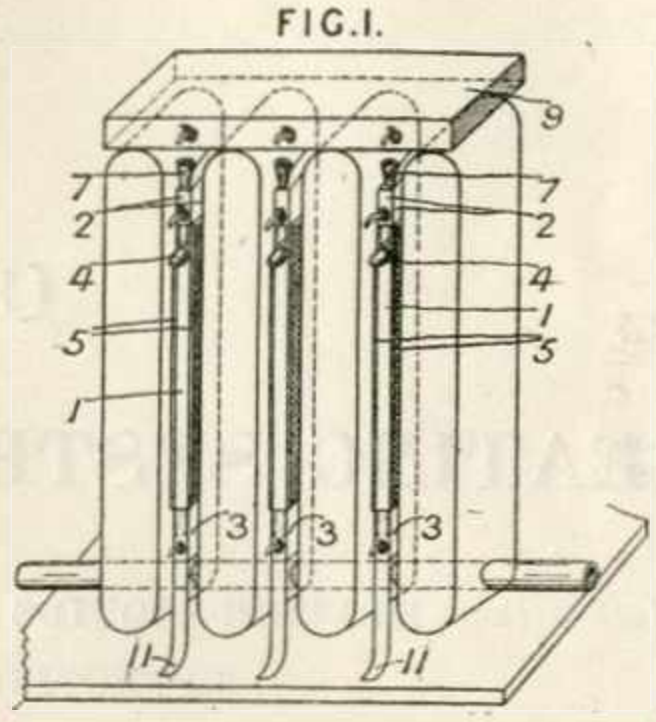
FIG.1.



245,438. Hartmann, F. Jan. 5, 1925, [*Convention date*].

Radiators.—Apparatus for moistening the air of rooms comprises a rectangular frame 1 provided with an upper water supplying tank 2, a lower excess-receiving tank 3, and a channel 4 which receives water from the tank 2 and over which is suspended a moistening cloth 5, whose free ends hang in the tank 3. The frames are preferably placed between the sections of a radiator and the tanks 2 are then fed from a common tank 9, the frames being supported on feet 11. Eucalyptus, menthol, tannic acid, perfumes &c. may be supplied to the cloth when used as an inhaler.

FIG.1.



245,494. Bonoff, H. A. Oct. 6, 1924.

Thermostats.—The circuit of an electric heating coil 3 is controlled by an electro-magnet 20 supplied from the same supply plug 10 but with a lamp or other resistance R in its circuit. In circuit with the electromagnet 26 is a mercury thermometer T which is immersed in liquid of the vessel 2 and is fitted with a series of contacts 27 so that by manual operation of the switch 24 the electro-magnet may be brought into operation to open the heating circuit at any desired temperature. A spring 15 closes the heating circuit when the temperature falls so that the mercury no longer completes the circuit of the electromagnet.

FIG.2.

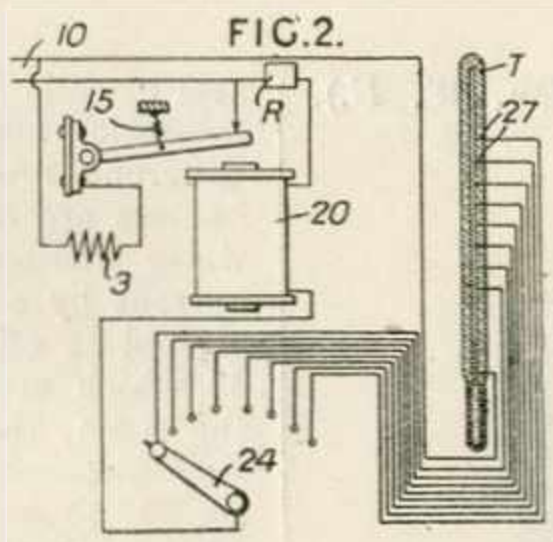
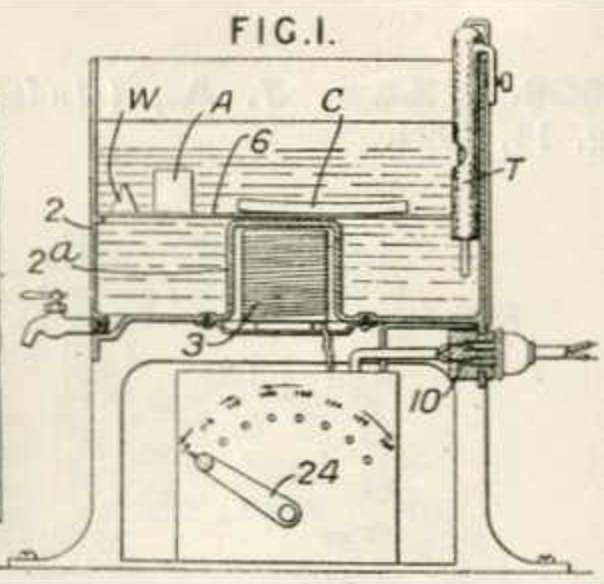


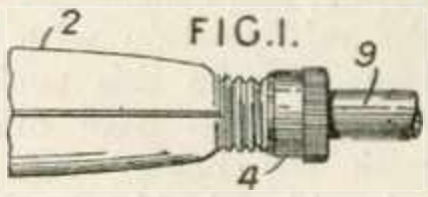
FIG.1.



245,988. Dunkley, A. April 24, 1925.

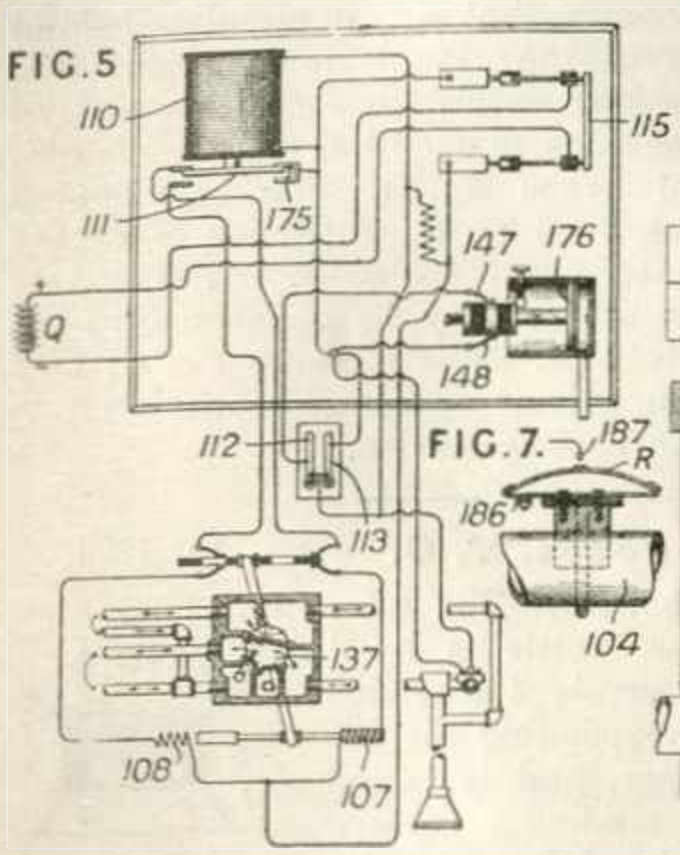
Bed warmers and airers.—The stopper 4 of a flat metal hot-water bottle 2 is provided with a screw-threaded socket into which a wooden or other handle 9 is screwed so that the bottle may be used in the manner of a warming pan.

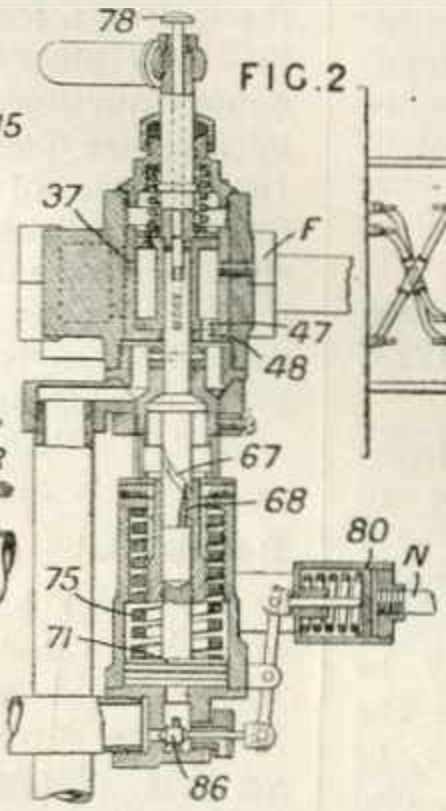
FIG.1.

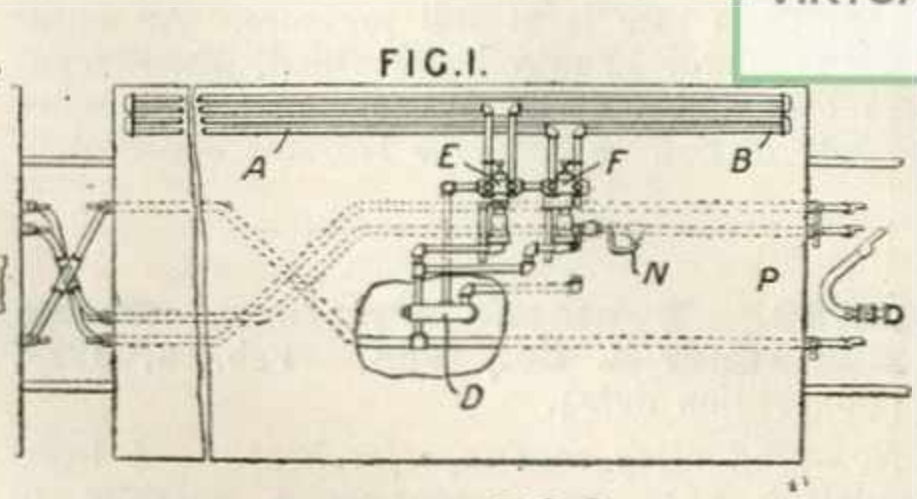


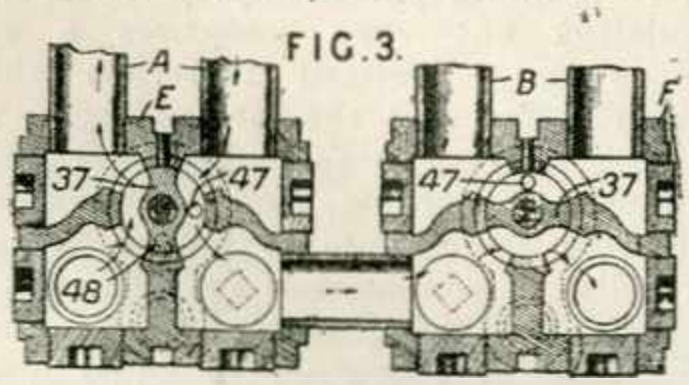
246,211. Marks, E. C. R., (*Vapor Car Heating Co., Inc.*). Oct. 21, 1924.

Heating vehicles.—In a steam heating-system for railway vehicles of the type in which the admission of steam to each radiator of the system is controlled by a valve which, when closed, provides a drainage outlet for the water of condensation from the radiator, the steam admission valve is operated by a motor and is automatically moved to a closed position so as to open the



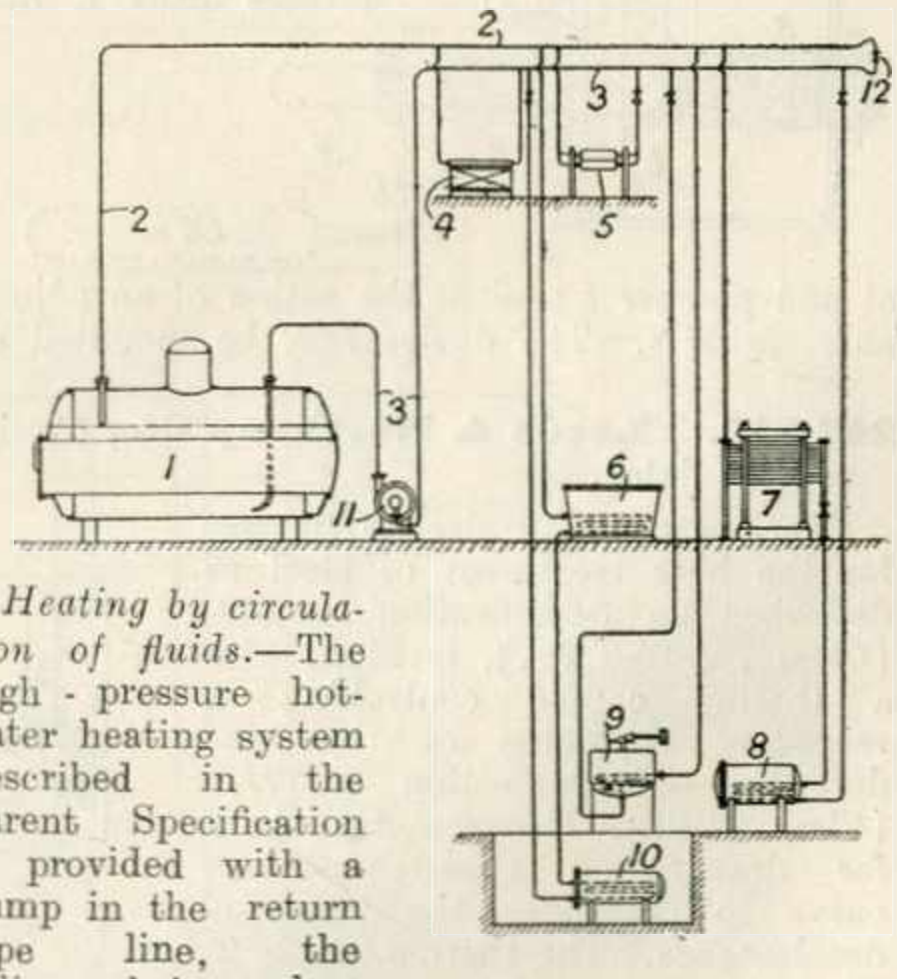






drainage outlet, which is connected to the inlet end of the radiator, upon the cessation of steam in the supply pipe. In the arrangement shown in Figs. 1, 2, and 3, the invention is applied to a system in which a main heater A is controlled by a valve in a casing E and an auxiliary heater B is controlled by a valve in a casing F, these valves being automatically operated by the pressure of the steam, but the auxiliary valve being capable of operation only when the locomotive is coupled and the air pressure in the signal line P operating through a pipe N, and piston 80, Fig. 2, opens a pilot valve 86. In this way, moderate heating of the vehicles can be accomplished by supplying steam from a terminal when the vehicles stand in a yard, but full heating is normally only obtainable when the locomotive is coupled. Each valve casing E, F, Fig. 3, contains a rotary valve 37 having a drainage port 47 which registers with a port 48, Fig. 2, in the valve casing only when the valve 37 is closed. Opening and closing of the valve is effected by the action of steam pressure in one direction and of a spring 75, Fig. 2, in the other direction upon a piston 71, the stem of which has a projection 68 engaging a spiral groove 67 in the stem of the valve 37. The connection between the valve 37 and its stem can be released by a push rod 78, allowing hand actuation of the valve, but the connection is automatically restored when the steam pressure again causes rotation of the valve stem. A thermostatically-controlled -valve in a regulator D regulates the amount of steam admitted to the radiators. In a modified arrangement, Fig. 5, the opening and closing of the valve 137 is controlled by two electromagnetic relays 107, 108, and the two heaters A, B are both either in use or out of use, the temperature to which the vehicle is heated being determined by low and high temperature thermostats 112, 113, the latter of which is operable only when air pressure in a signal line 175 acting on a piston 176 breaks contact between fingers 147 and a contact ring 148 and throws the low temperature thermostat out of use. In order to effect a closure of the valve 137 when the steam supply ceases, thus allowing the condensed water to drain away, an expansion-type thermostat R is fitted on the supply pipe 104, Fig. 7, so as to complete a circuit through contacts 186, 187, short-circuiting the relay 110 and so energizing the relay 107 which closes the valve.

246,436. Caliqua Wärmeges, (*formerly* Hemming & Co., Ges. für Warmetechnik). Jan. 23, 1925, [*Convention date*]. *Addition to* 234,507.



Heating by circulation of fluids.—The high - pressure hot-water heating system described in the parent Specification is provided with a pump in the return pipe line, the delivery being calculated or controlled so that no suction effect is produced in the system, so that vaporization is avoided. The heater 1 supplies hot water at a pressure of about 10 atmospheres through pipe 2 to various points of heat consumption 4 - - 10. The return pipe 3 includes a pump 11, the output capacity of which is such that the water

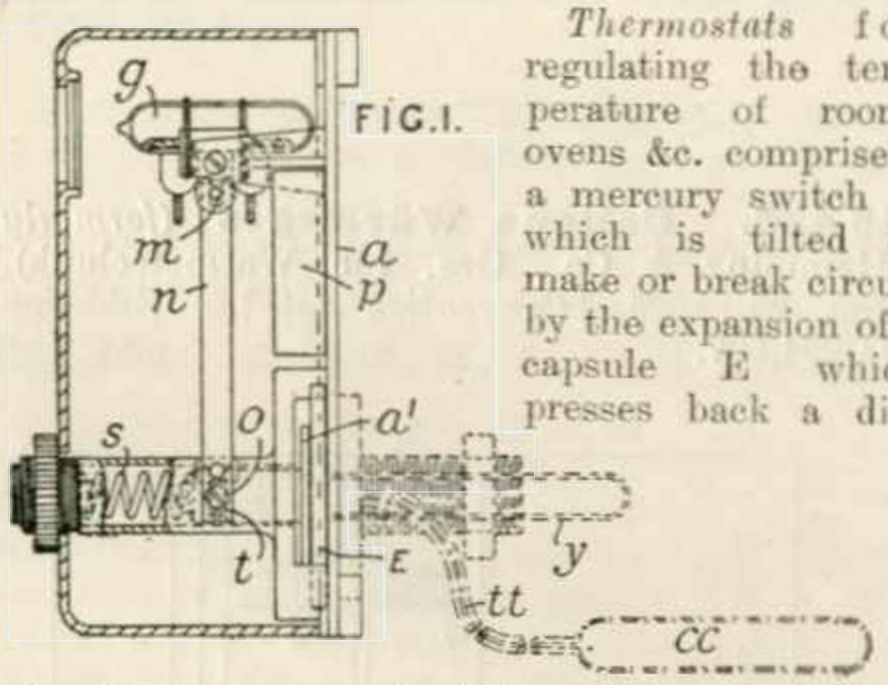
always flows into it at full pressure. An automatic regulator 12 may be provided, which regulates the pump so that given constant pressure the rate of flow in the pipe remains constant.

246,788. Deutsche Prioform Werke Bohlander & Co., Ges. Feb. 2, 1925, [*Convention date*].

Non-conducting coverings for heat. — A heat-insulating substance comprises a mixture of fibrous and pulverized materials which are of such fineness that the air-cells have a diameter of $^1/_{500}$ to $^1/_{10000}$ mm. The fine subdivision is obtained by carding, and the mixture may be subjected to pressure to reduce the size of the air cells. The materials may be cotton, silk, or slagwool, and soot, magnesia, or kieselguhr, and they may be employed in equal quantities by weight. The dimensions of the air cells are of the same order as the mean free path of the air molecules, which ensures a very low heat conductivity.

246,969. Wilkinson, G. Dec. 16, 1924.

FIG. 1.

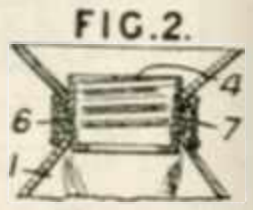


Thermostats for regulating the temperature of rooms ovens &c. comprise a a mercury switch *g* which is tilted to make or break circuit by the expansion of a capsule E which presses back a disc a^1 and plunger *t* against the action of an adjustable spring *s*. The device may be mounted on the wall of a room so that air can circulate behind the back plate *a*; the capsule is mounted on a non-conducting base with its back plate separated by distance packings to facilitate air circulation. In the case of ovens &c. it may be mounted directly on the oven or an extension *y* of the capsule may extend into the oven. Alternatively a remote chamber *cc* may be connected to the capsule by a tube *tt*. The mercury switch may break a heating circuit or complete a circuit to a fan or other cooling device.

246,973. Jones, F. C. Dec. 19, 1924.

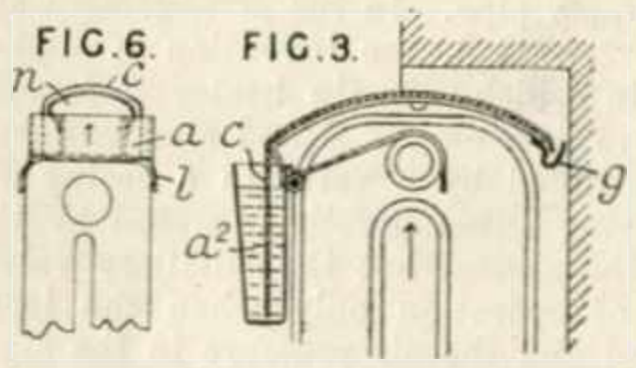
Hot-water bottles.—The neck of a hot-water bottle is lined with a rigid ferrule 4 threaded to engage corresponding threads on the stopper, and is bound externally by binding 6 covered by a rubber band 7.

FIG. 2.



247,864. Grab, C. Sept. 28, 1925.

FIG. 6. FIG. 3.

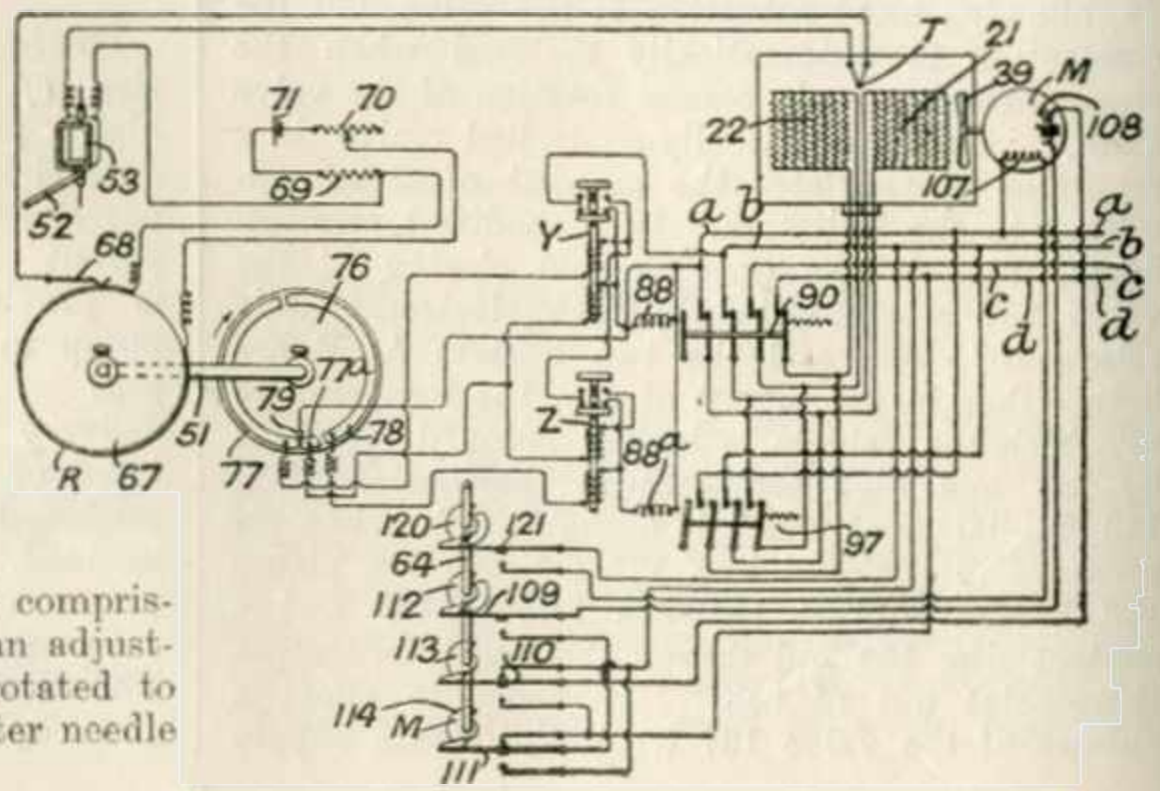


Radiators. — The hot air ascending from radiators is moistened by a horizontal sheet of absorbent material *c* dipping into liquid containers *a* the sides of which are provided with longitudinal elements *l* embracing the top of the radiator along its whole length. The sheet is supported on bowed transverse bars *n* thus forming a domed roof from the ends of which the moistened air escapes. When the radiator is built into a niche, one side only of the sheet dips into a container a^2, Fig. 3, the other side dipping into a gutter *g*.

247,912. Leeds & Northrup Co., (Assignees of *Harsch, J. W.*). Feb. 20, 1925, [*Convention date*].

Thermostats.—An electric furnace for the heat treatment of steel as described in Specification 100,679, [*Class* 72, Iron &c.], is fitted with a thermo couple controlling a recording apparatus of the kind described in Specification 25717/13 [*Class* 97 (iii), Thermometers &c.], for drawing a time-temperature curve to determine the times of decalescence. The thermo-couple T, Fig. 5, is connected to a galvometer coil 53 and a contact 68 engaging a resistance R on a disc 67 mounted on a shaft 51, the resistance R and the coil 53 being connected to a circuit comprising a resistance 69, a battery 71, and an adjustable resistance 70. The disc 67 is rotated to balance the circuit when the galvanometer needle

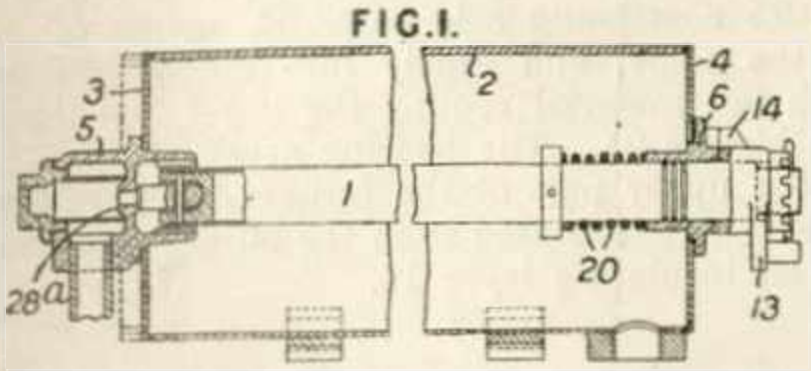
FIG. 5.



52 is not in mid-position, the shaft 51 also operating the marker of the recording apparatus. The furnace is fed with two-phase current from leads *a*, *b* and *c*, *d*. The heating circuit is fitted with switches 90, 97 operated by coils 88, 88*a* controlled by relays Y, Z of a type wherein the cores remain in the position to which they were last attracted. The heating resistances 21, 22 are each connected across one phase, are connected in parallel across *a*, *b*, or the heating circuit is broken when the contact 79 engages strip 77, 77*a*, or 78 respectively, the strips being secured to a disc 76 on the shaft 51.

248,198. Peters & Co., Ltd., G. D., and **Chattaway, H. A.** April 7, 1925.

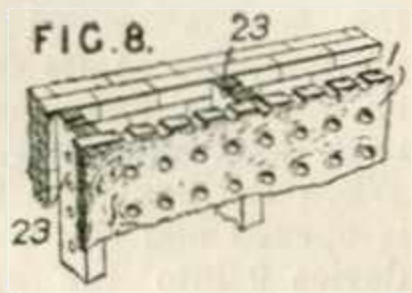
FIG. 1.



Radiators for heating railway vehicles, and of the type having inner and outer tubes 1, 2, of different coefficients of expansion, are constructed with welded on end plates 3, 4, the inner tube 1 being mounted or supported at its ends in carrying members or castings 5, 6, detachably secured in apertures in the end plates. The valve on the end of the central tube is kept pressed by a spring 20 towards the valve seat 28*a* but can be withdrawn therefrom on rotation of a lever 13 on cam surfaces 14 on the casting 6. In a modification, a ball valve is pushed against or allowed to fall from the valve seat by a solid head on the tube 1. Specification 173,370 is referred to.

248,221. Byrne, E. L. W., (*Dahlberg & Co., Inc.*). May 16, 1925.

FIG. 8.



Non-conducting coverings for sound.—A sound-absorbing covering for walls and ceilings consists of perforated or grooved porous boards 1 made of vegetable fibres such as bagasse. The perforations are drilled, gouged, or sawn to produce ragged edges and may extend wholly or partially through the thickness and may be parallel, tapered, or shouldered. The boards may be applied directly to the wall or be spaced therefrom by supports 23 which may have apertures for air circulation. A thin sheet of similar porous material or fabric such as burlap may be applied to the boards to cover the perforations and may be coloured to suit the surroundings.

248,394. Besta, A. Feb. 28, 1925, [*Convention date*].

Heating systems and apparatus. — In a process for annealing metals &c. in spaces filled with a neutral gas, the materials &c. are placed in superposed containers which are forced upwards vertically or at an angle, are heated while so being moved, are moved laterally when they have reached the highest positions and then are moved downwards, being cooled during the latter movement. The annealing boxes 2 are introduced one at a time into a space 4, from which, after the door 3 is closed, the air is exhausted, and is replaced by inert gas. The slide 5 is now opened and the box 2 forced up into the furnace by a charging device 6, the perforated box being provided with lugs 31, Fig. 3, which,

FIG. 1.

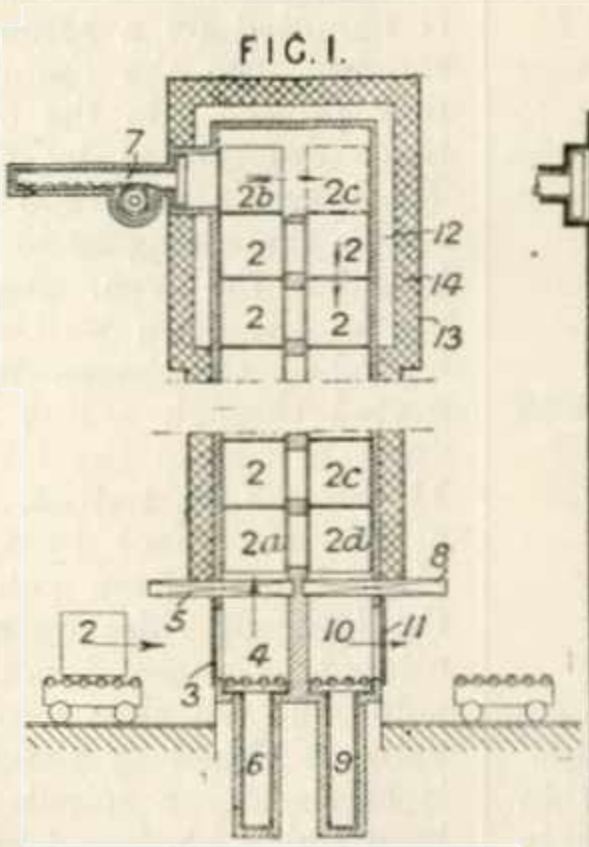


FIG. 2.

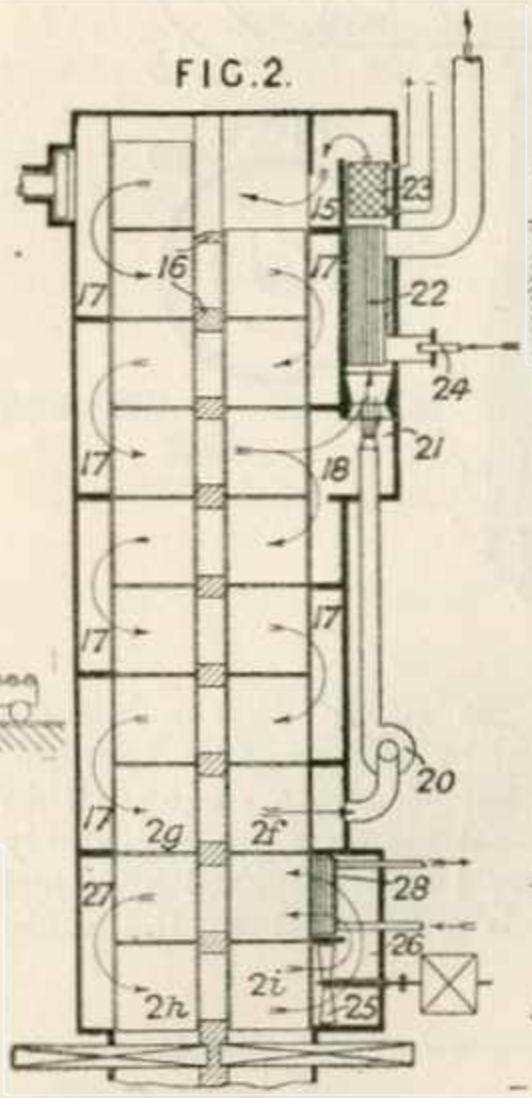


FIG. 3.

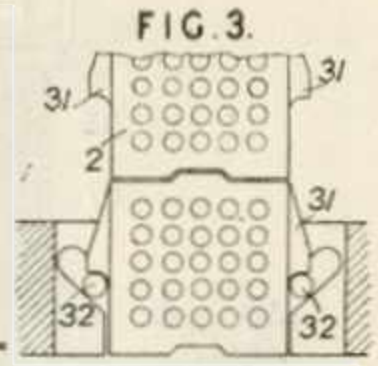


FIG. 4.

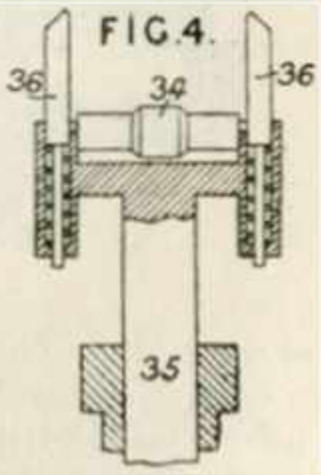
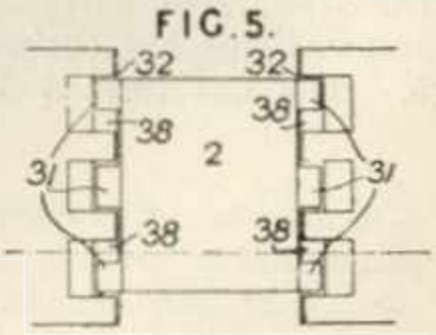


FIG. 5.



when the box is pushed upward, force aside shafts 32 movably mounted in the sides of the furnace until the lugs 31 have passed the shafts 32, when the lugs 31 then rest on the shafts thus holding the box in position. When another box 2 is charged into the furnace in a similar manner the box 2 already in the furnace is pushed up by the lower box and then held in position as before. When in the position 2*b*, the box is pushed by means 7 into the position 2*c*, and then the boxes are caused to move downward to the position 2*d* by spring-pressed arms 36 carried by a plunger 35, the upward movement of the latter causing the arms 36 to bear against, and force aside, the shafts 32 when the box is lifted by the rollers 34 carried by the plunger 35. The arms 36 slide into recesses 38 and lock the shafts 32 in position so that on the return movement of the plunger 35 the box is moved downwards into the next position, the shafts 32 running over the lugs 31 on the box and engaging the lugs 31 of the next descending box and holding it in position. When the box is in the position 2*d*, the slide 8 is opened and the box lowered by a discharging device 9 into the space 10, the box 2*c* being automatically held in position during the discharge of the box 2*d*. The bottom of the furnace is now closed by the slide 8, the door 11 opened, and the box 2*d* removed. The door 11 is now closed and the space 10 evacuated and then filled with inert gas before the box 2*c* is discharged from the furnace in a similar manner to the box 2*d*. The furnace is heated by hot gases which enter at the part 15 and pass around the annealing boxes through flues 17 and between the bridge-pieces 16. In the flue 18 part of the gases pass downwards into lower flues 17, the other part passes upwards and is drawn and forced upwards by a blast producer 21 into a heater 22 heated by a burner 24 and an electrical heater 23 before passing into the furnace again at 15. The rest of the gases pass downwards through flues 17 &c. and becoming cooled are conveyed by a blower 20 into the blast producer 21 and so to the heaters 22, 23. Some of these gases are directed through flues 26, 27 by a blower 25 into a cooling device 28, the cooled gases passing into a box 2*f* and thence into boxes 2*g*, 2*h* containing cold material, giving off heat to the same, and finally into the box 2*i* filled with hot material cooling the latter and then to the blower 25. The heating space 12 is located in the upper part of the furnace, the inner part of which is separated from the outer sheathing 13 by an insulating layer 14.

248,431. Marks, E. C. R., (*Wilson Co., H. A.*). Nov. 7, 1924.

FIG.2.

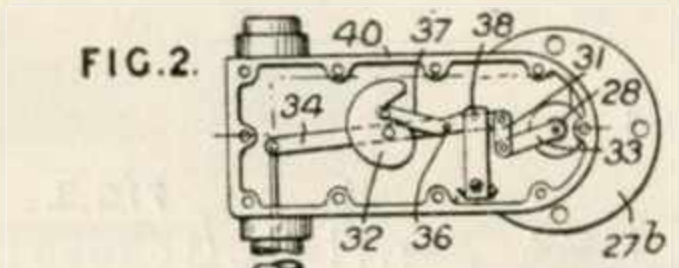
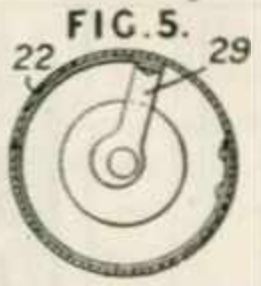
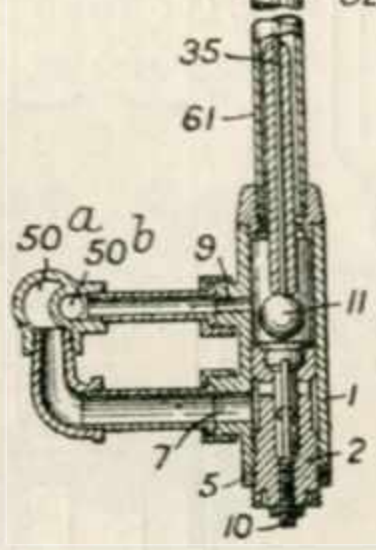


FIG.5.



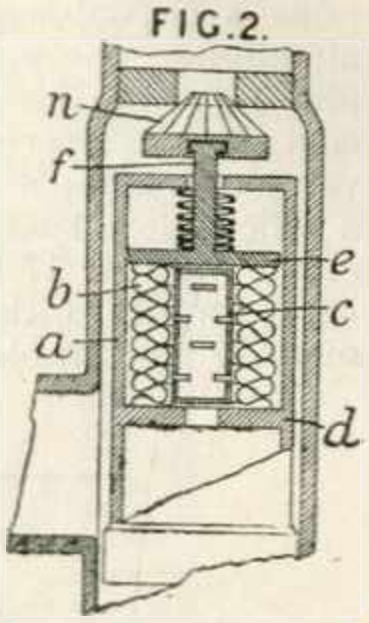


Thermostats.—The gas supply to the burners of an oven is controlled by a thermostat comprising a bimetallic strip enclosed in a casing within the oven. The valve seat member 2 is adjustably screwed into the casing 1 and is locked by a nut 5. The gas inlet 7 is connected to the main through a passage 50*a*, and the gas passes to the burners through a port 9 and passage 50*b*. A rod 10 is adjustable in the seating 2 to prevent the valve from seating completely, so that a pilot light may be supplied. The thermostat comprises a casing 22, Fig. 5, containing a bimetallic strip one end of which is secured to the casing, and the other end to an arm 29. The casing 22 is mounted on a screwed sleeve, which is also screwed into the casing 40, and the casing 22 may project into the oven to any required distance determined by the length of the sleeve. The length of the tube 61 may also be varied, to enable the casing 22 to be placed at any required height in the oven. A plate 27*b* covers the opening in the oven wall. The shaft 28, which is moved by the thermostat, carries an arm 33 connected through a link 31 to a lever 34. The opposite end of the lever 34 operates the valve 11 through its rod 35. The lever 34 is pivoted at 36, the pivot being carried by a lever 37 pivoted to a fixed point 38. The free end of the lever 37 rides on a cam 32 which can be rotated in either direction to move the fulcrum point 36, and thus vary the point at which the valve is closed by the thermostat. The cam 32 is carried by a spindle attached to a graduated head which can be set to any desired temperature. The cam is of such a shape that the graduated scale of temperature is uniform.

248,549. Lorenz, F. W., and **Baumeister, F. X.** Feb. 21, 1925.

Thermostats.—In a thermostat employing an elastic chamber having deep corrugations, the chamber is normally compressed by a spring and guided on a central hollow perforated member. The casing *a* has an internal flange *d* supporting the elastic chamber *b*, the corrugations of which are normally in contact. The upper end of the chamber is closed by a cover *e* carrying a spindle *f* on which a valve *n* is rotatably mounted. The central guiding member *c* is hollow and perforated, so that the chamber contains a larger quantity of the expansible fluid.

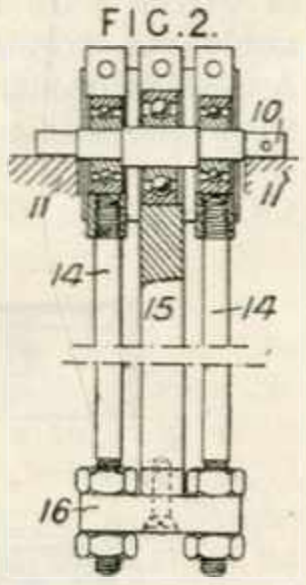
FIG.2.



248,978. Kirkland, J. W., (*Allgemeine Elektricitäts Ges.*). June 18, 1925.

Thermostats.—A shaft 10, supported at 11, is rotated by the expansion of rods 14, 15 under the influence of heat. The rods 14, 15 are connected at their lower ends by a cross piece 16 and are suspended from the shaft 10 by ball bearings the inner races of which are concentric with the axis about which the shaft 10 rotates in the case of the rods 14 but are eccentric with this axis in the case of the rod 15. The eccentricity may be produced by an eccentric on the shaft or by the shaft being cranked. The rod 15 has a greater coefficient of expansion than the rods 14, so that when the rods are heated the upper end of the rod 15 will move upwards and cause the shaft 10 to rotate. The device may be used to operate an electric switch or for other purposes.

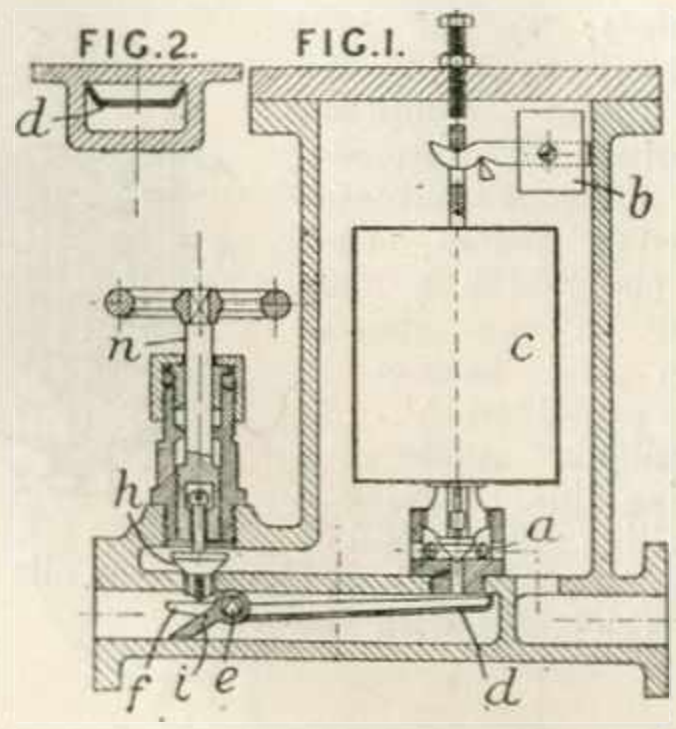
FIG.2.



249,345. Rohonci, H., and **Godra, J.** April 25, 1925.

Steam traps.—A float-operated steam trap is provided with an impact surface which receives the discharge from the usual valve and thereby operates another discharge valve. The valve *a* is operated by a float *c* balanced by a weight *b*, and the condensation water is discharged against a lever *d* pivoted at *e* and having a counterweight *i* which normally keeps the part *d* raised. Impact of water against the part *d* causes the part *f* to lift a by-pass valve *h* through which water is rapidly discharged. The valve *h* may be hand-actuated by a spindle *n*. A modification

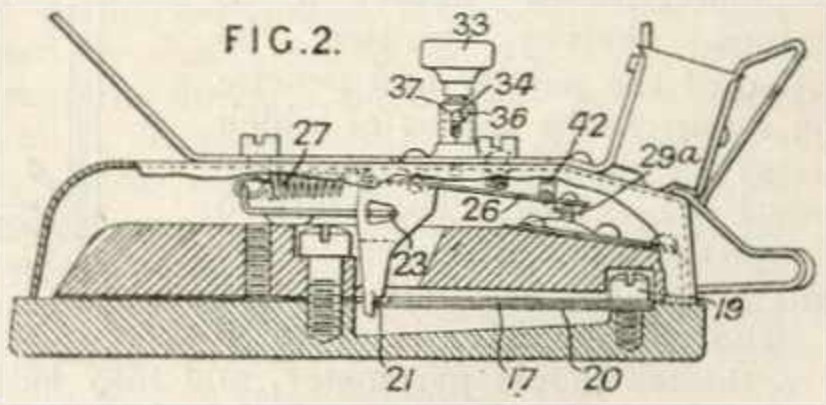
FIG.2. FIG.1.



is described in which the impact surface is rigid with the second valve.

249,561. British Thomson-Houston Co., Ltd., (Assignees of *Kelly, W. D.*). March 21, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

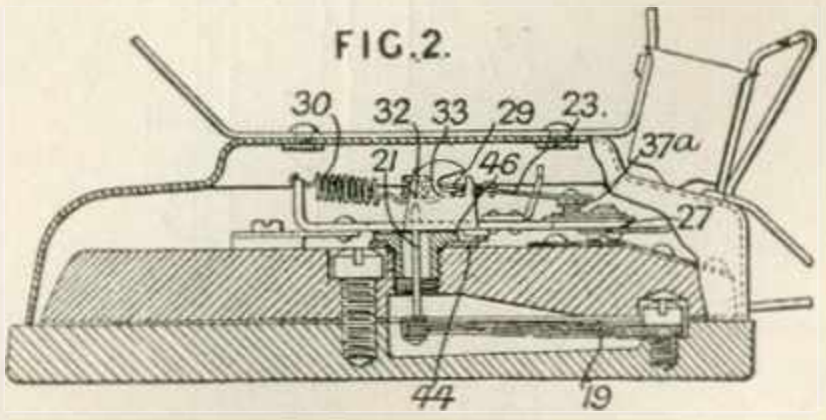
FIG.2.



Thermostats.—Bi-metallic strips 17 are welded together at 19 and disconnected for the remainder of their length and move downwards in unison when the temperature rises till a switch arm 26 is released and opens the heating circuit.

249,562. British Thomson-Houston Co., Ltd., (Assignees of *Kelly, W. D.*). March 21, 1925, [*Convention date*].

FIG.2.

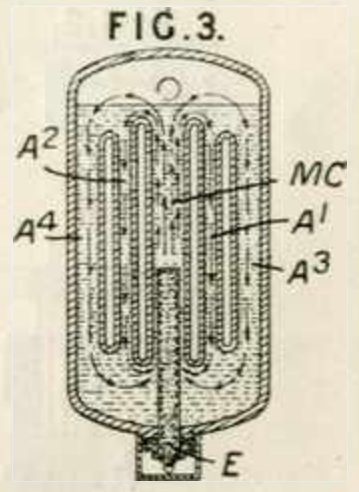


Thermostats.—A heat-sensitive element for use in electric irons consists of a number of bimetallic strips 19 welded together at one end only.

249,602. Prentice, F. W., and **Culbertson, R. A.** Dec. 24, 1924.

Radiators; special heat transmitting media. — An electric radiator comprises a plurality of interconnected sections situated in different planes, each section comprising a main container MC connected at the top and bottom to auxiliary containers A^1 - - A^4 The radiator employs a circulating liquid having a high boiling point and a low freezing-point such as glycerine or oils which may be thickened with sea-weed.

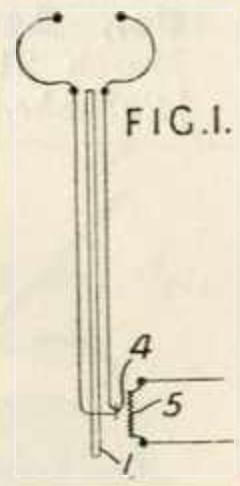
FIG.3.



249,612. Foster, C. E. Dec. 30, 1924.

Thermostats.—A thermo-couple 4 carried by the pointer 1 of a galvanometer is arranged to come into contact with a heater 5 when a predetermined deflection is attained, thereby limiting the motion of the pointer and generating a current by means of which a relay for signalling or automatic control is operated. The heater 5 is adjustable and arranged in the same plane as the thermo-couple 4. The galvanometer is operated by a thermo-couple pyrometer, and may actuate a relay for maintaining an electric furnace at a desired temperature.

FIG.I.



249,668. Barty, T., and **Westinghouse Brake & Saxby Signal Co., Ltd.** March 18, 1925.

FIG.1

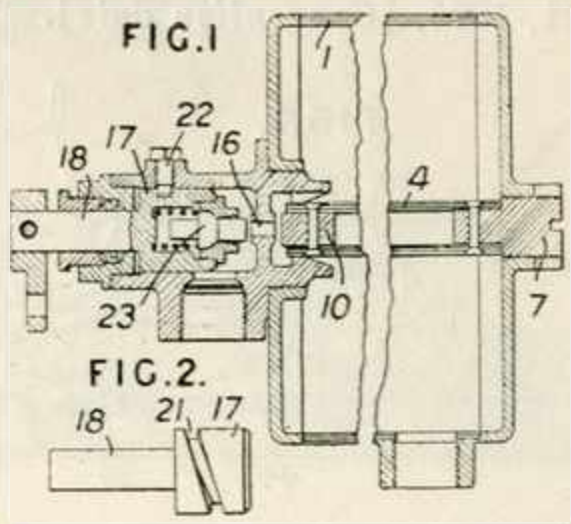


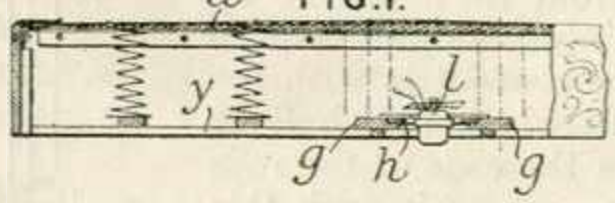
FIG.2.

Radiators.—Steam heating apparatus for railway vehicles is provided with a thermostatic control of the steam supply, and also with a hand-operated control valve actuated through a pin and slot connection. The heating unit 1 contains a coaxial expansion tube 4, preferably of aluminium, one end being secured to a screwed plug 7 and the other end carrying a plug 10 which controls the aperture 16. The hand-operated valve comprises a cylindrical member 17 having a helical slot 21 engaging a fixed pin 22. Rotation of the member 17 by a stem 18 moves the member forward so that the spring-pressed closure member 23 controls the aperture 16.

249,760. Beucher, F. L. A., and **Rollion, P. M.** March 26, [*Convention date*].

Bed warmers and airers.—Mattresses and overlays are aired or heated by the passage therethrough of an air current which may be cold or hot. A box-spring mattress is provided with a ventilating fan *l*, Figs. 1 and 2, or an air-supply pipe, which is placed between the spring bearers *g*. An airtight bottom covering *y* causes the injected air to escape by way of a porous top *d* of woven wire fabric attached by hooks *s* to an angle-iron frame at the upper edge of the box. A stuffed mattress or overlay Fig. 10 is placed upon the box spring mattress and has a porous

d FIG.1.



d FIG.2.

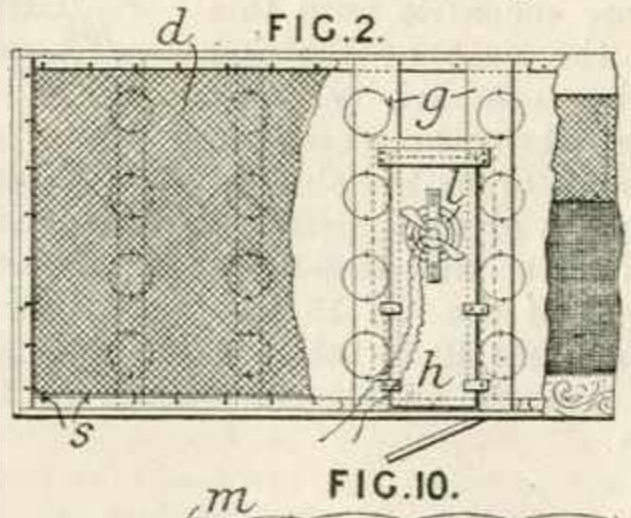
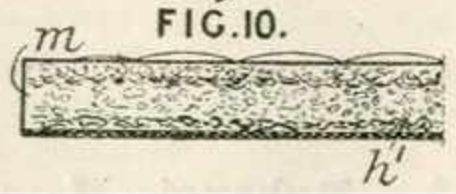


FIG.10.



woven-wire lower surface h^1 and side vents *m* through which the air coming from the lower mattress finally escapes. Electrical or other heating means may be combined with the ventilating fan, which is mounted on a slide *h* in the mattress frame.

250,288. **Marks, E. C. R.,** (*Wilson Co., H. A.*). Nov. 7, 1924.

FIG. 2.

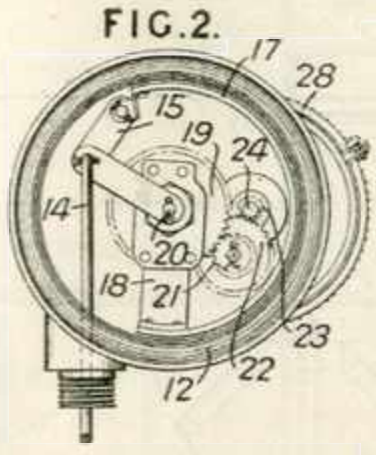
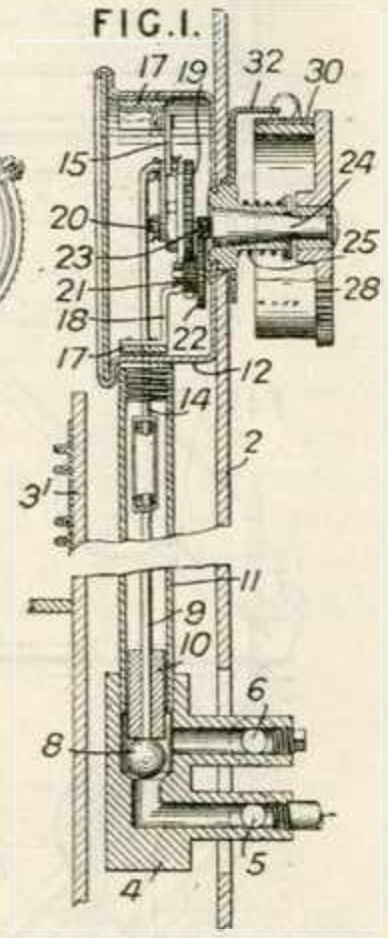


FIG. 1.



Thermostats.—A thermostatic device for controlling the supply of gas to gas ovens is provided with means for bodily changing the position of the thermostat and the position of the valve relatively to its seating to set the device for the required temperature. The valve casing 4 projects through the wall of the oven 2, the passage 5 being connected to the gas supply, and the passage 6 to the burner. The ball valve 8 is carried by a rod 9, and weighted by a mass 10. A pipe 11 is located between the inner and outer oven walls 3^1, 2, and is connected at its upper end to the thermostat casing 12. The rod 14 is pivoted to a link 15, connected at its opposite end to one end of the bimetallic element 17. The other end of the element 17 is connected to a bracket 18 which carries a gear wheel 19 on the shaft 20. The wheel 19 engages with gearing 21, 22, 23, the last being carried by a tapered shaft 24. The gear ratio between the shafts 20, 24 is 1 : 16. The tapered shaft 24 forms a gas-tight joint with the aid of the spring 25. The shaft 24 has a flat which engages the disc 28 in predetermined position, the latter carrying an adjustable temperature scale 30, co-operating with a pointer 32. The disc is initially calibrated and the scale 30 set to a known temperature in the oven. The disc 28 may then be set to any required temperature to be maintained by the thermostat.

250,318. **Fasting, J. S.** Jan. 8, 1925.

Heating granular materials.—Rotary drums for heating materials by a current of air are fitted with heat-exchanging bodies which have a movement through the material and the air current relative to the rotational movement of the drum. The bodies may comprise metal cylinders 3, 4, Fig. 1, of different sizes, resting on the bottom of the drum 1, the material and the air passing through the cylinders as well as around them, or rings 5, Fig. 2, maintained in an upright position by chains 6 anchoring them to the drum wall. Alternatively, rings of equal size may be connected in pairs or sets by axial or peripheral longitudinal rods, so as to maintain them in an upright position. Where the rings are of different sizes the air is caused to take a tortuous path through the drum. In another form, the bodies comprise plates 7, Fig. 4, anchored by chains 8 and preferably provided with diagonal ribs 9 to promote or retard the passage of the material through the drum. Chain or like fabric bands

FIG. 1.

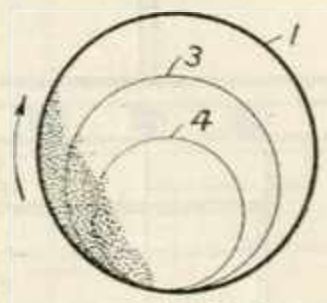


FIG. 2.

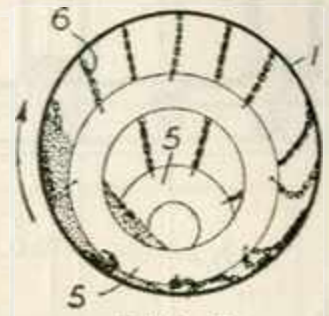


FIG. 4.

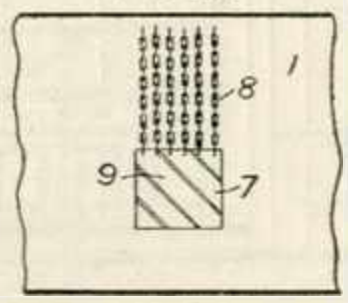
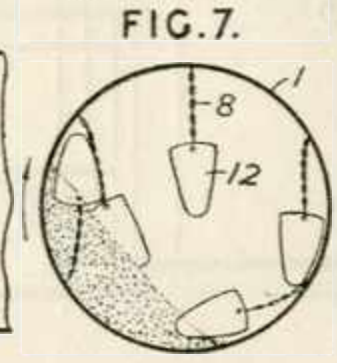


FIG. 7.



may be used in place of the plates 7 and their suspension chains. Another form comprises cups or bucket-shaped bodies 12, Fig. 7, suspended by chains 8 and adapted to lift some of the material during their movement and discharge it again. These bodies prevent the material from being excessively scattered and carried away in the air current. When treating wet material by a hot air current, the material may be forcibly directed against the heat-transmitting bodies by introducing it into the drum under pressure through one or more jet-pipes.

250,638. **Braithwaite & Co., Engineers, Ltd.,** and **Telford, J. C.** Dec. 19, 1924.

Heating buildings.—A heating system for a metal house or other building, more particularly of the kind described in Specification 249,908, [*Class* 20 (iv), Floors &c.], in which the outer wall formed from flanged steel plates *a* and the inner wall formed from asbestos &c. sheets *b* are separated by an air space, has the chimney breasts *h*, *n* formed from flanged steel plates, which are secured to the walls of the building and communicate by means of apertures with the air space between the walls. The chimney breasts surround the metal flues *l*, which may be formed with heat-radiating fins &c., the heated air in the chimney breasts circulating throughout the walls of the building. Fig. 2 shows the arrangement of two identical chimney breasts *h* secured in alignment on opposite sides of the party wall *d* on

FIG. 1.

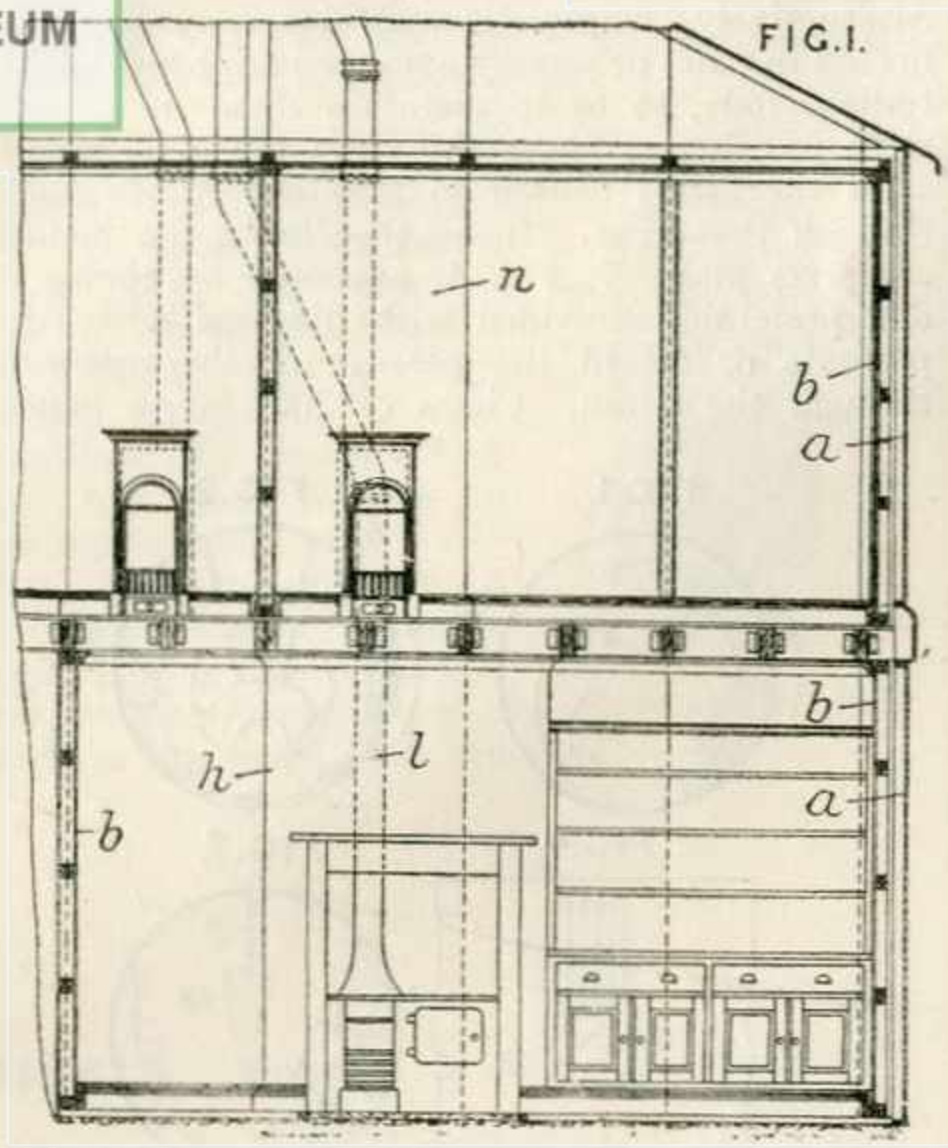


FIG. 2.

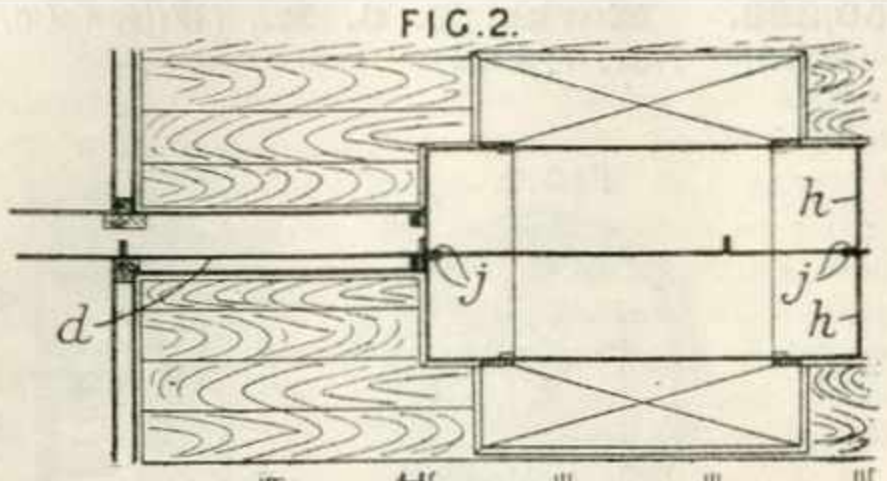
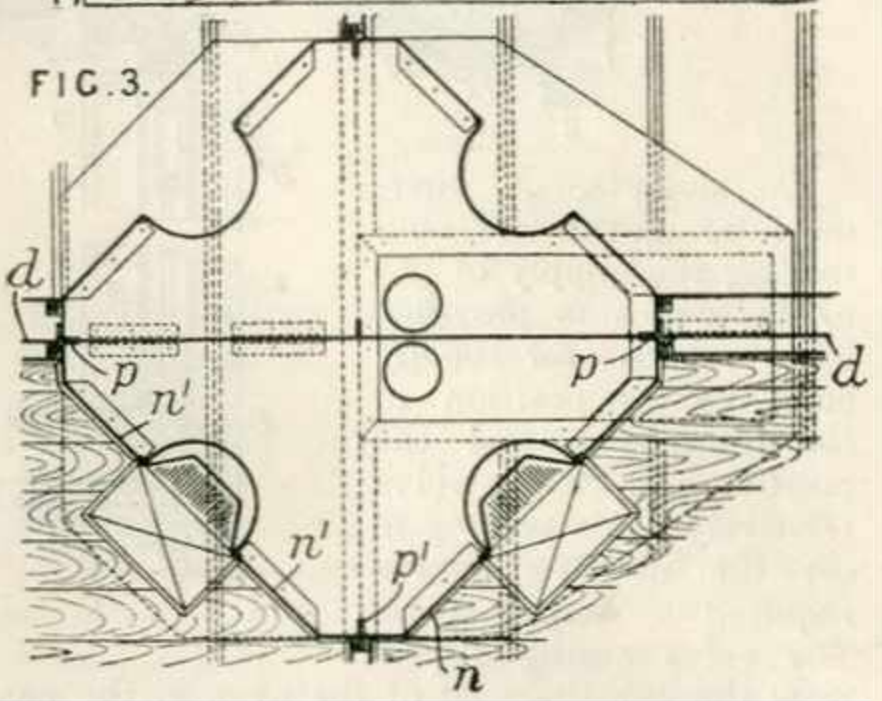


FIG. 3.



the ground floor of a building; Fig. 3 shows two pairs of chimney breasts n, n^1 of triangular cross-section secured in alignment on opposite sides of a partition wall d on the first floor, the chimney breasts n, n^1 being arranged over corresponding chimney breasts h.

250,878. Bishop, C. Jan. 22, 1925.

Non-conducting coverings for heat.—Cork which may be " waste " obtained in the manufacture of cork slabs, is ground and screened to obtain a granulated substance, and then heated and sprayed with casein or varnish to enable it to bind together. If the cork contains sufficient natural gum, the addition of a binder is omitted. The material is then compressed slightly, with or without heating, to form it into blocks for transport. The blocks are employed for packing the double walls of a chamber to be insulated, and the material is treated in situ with hot air and low pressure steam to cause it to expand and fill the space completely. The steam is gradually reduced, and the operation finished with hot air only. The inner wall may be removed, or it may be left as a protection for the cork. In an alternative, the cork may have a partly embedded layer of expanded metal adapted to receive a protecting cover of cement. The inner wall may be of sheet metal having slots punched in it, or of wire mesh, and may be temporarily covered with wood to close the openings while filling with cork. Strengthening members may be provided within the outer wall.

251,001. Aerozan Air Conditioning Co., Ltd., Pratt, W. T., and **Lipscombe, H. W. J.** Jan. 19, 1925.

FIG. 1.

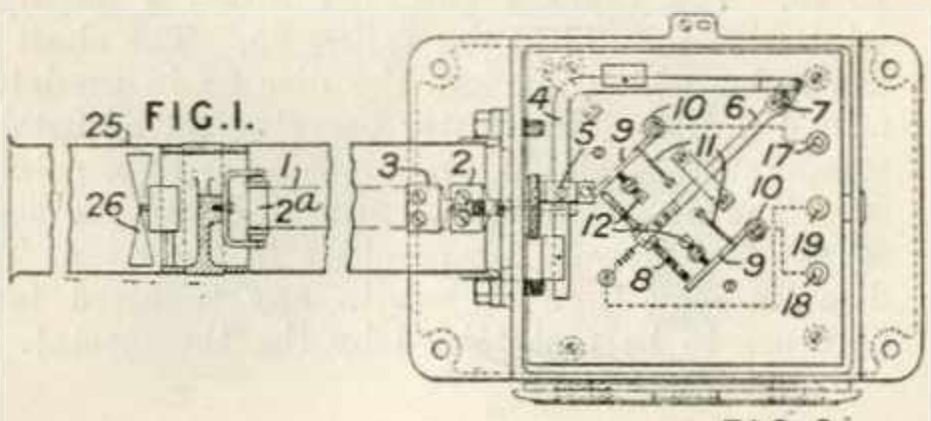
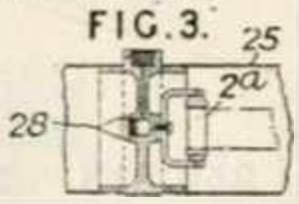


FIG. 3.



Thermostats.—Means for controlling the temperature of air to a treating, storing, work, or like room of a building is actuated by a sensitive element, such as a copper band, located in a tube or casing placed in the said room, and means are provided to circulate the air in the vicinity through the said tube and past the element. The element 1 is clamped at its ends to blocks 2, 3 and passes over a pulley 2^a arranged in a tube 25 through which air is circulated either by a fan 26, Fig. 1, or by a divergent jet of gas issu-

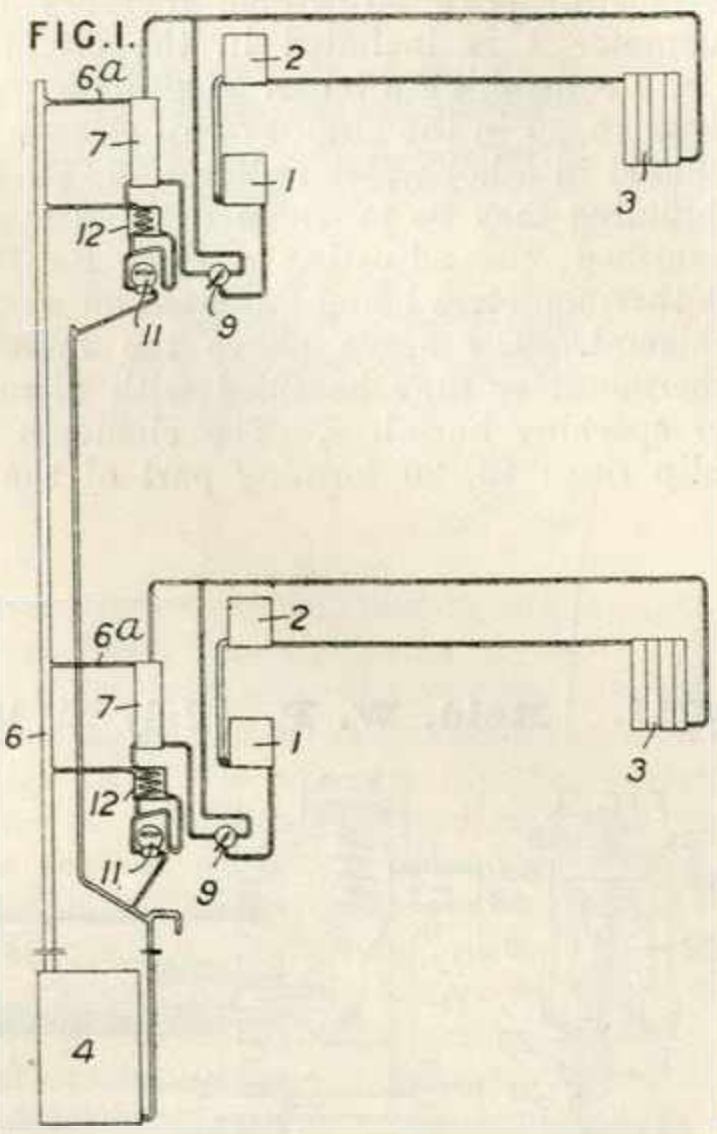
ing from a nozzle 28, Fig. 3. The block 3 is connected to a pivoted lever 4 near its pivot 5, and at the other end the lever 4 is connected to a pivoted lever 6. The end of the lever remote from its pivot 7 is adapted to engage either of a pair of contact arms, pivoted at 10 and each held against a stop 12 by a spring 11. If desired, the lever in its neutral position may engage contact studs on either side and require a definite movement to break a contact, or the lever may contact progressively with a number of studs arranged on one or both sides of the lever. The arms 9 are connected to terminals 17, 18 respectively, and the lever 6 to a terminal 19, the said terminals being connected to a double solenoid, which controls a cock in a pipe supplying liquid to an air-conditioning apparatus such as described in Specification 220,703, [*Class* 137, Ventilation].

251,150. Luytgaerens, P. July 30, 1925.

Non-conducting coverings for heat and sound.—A compound sheet material is formed by combining, under heat and pressure, one or more sheets of agglomerated cork with sheets of paper, cloth, or other covering material coated or impregnated with a natural or synthetic resin. The coated paper &c., which may be embossed, coloured, painted or enamelled, is laid in one or more sheets on the face or faces of the sheet of cork, and the whole subjected to a pressure of 10—30 kilos per square centimetres at a temperature of 100—150° C.

251,379. Moreau, H. Feb. 20, 1925.

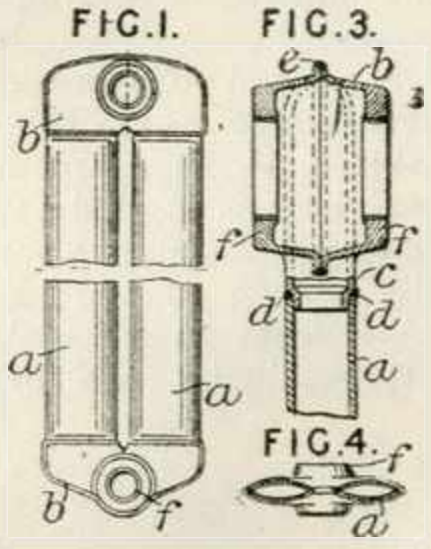
Heating buildings.—In a system for heating buildings by water circulation, the water after circulation in each section of the building is reheated by steam and the quantity of steam condensed is measured to indicate the heat consumed. Steam is generated in a boiler 4 and passes into a pipe 6 having branches 6^a leading to heat exchangers 7. Circulating water is reheated in the heaters 7, passes to the radiators 3, and returns through a pulsating device 1, 2. The returning water may be divided by a valve 9, part passing through the heater 7, and part returning direct to the radiators so that the temperature may be regulated. The condensed steam passes from the heater 7 through a small heat exchanger 12, and the re-heated water together with the water of condensation pass through a meter 11, which measures its volume and thus indicates the number of heat units consumed. A modified arrangement is described in which the valve 9 is omitted and a simple valve substituted which controls only one of the conduits. The circulation may be accelerated by an



injector utilizing the steam generated in the heat exchangers.

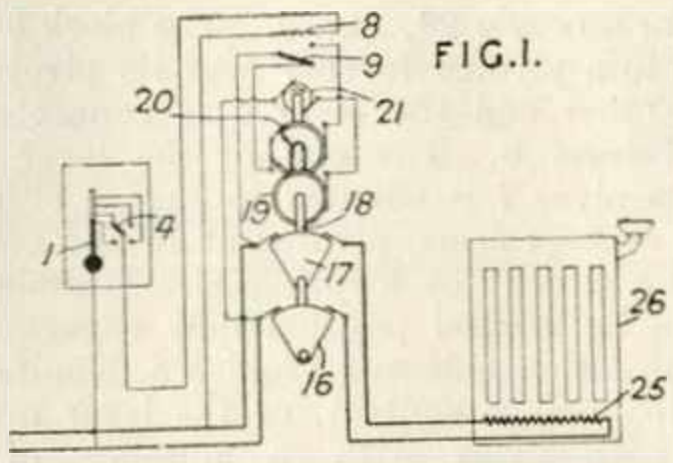
251,619. Mannesmannrohren-Werke. April 30, 1925, [*Convention date*].

Radiators. — Radiator tubes *a* are connected by wrought iron hubs *b*, each of which consists of two similar halves which are welded or soldered together at *e*. The halves are pressed out of the solid material in a heated condition, thickened parts *f* for the usual nipple threads, unions *c*, and stepped guiding-rims for the tube *a* being produced at the same time. The tubes *a* are then pushed on to these guiding rims and are welded or soldered at *d* to said unions *c*. The lower hub is so shaped that the upper edge of the lower welded seam is at its lowest point tangential to the bore of the hub at the bottom of the latter, so that water of condensation can flow away through the aperture *f*.



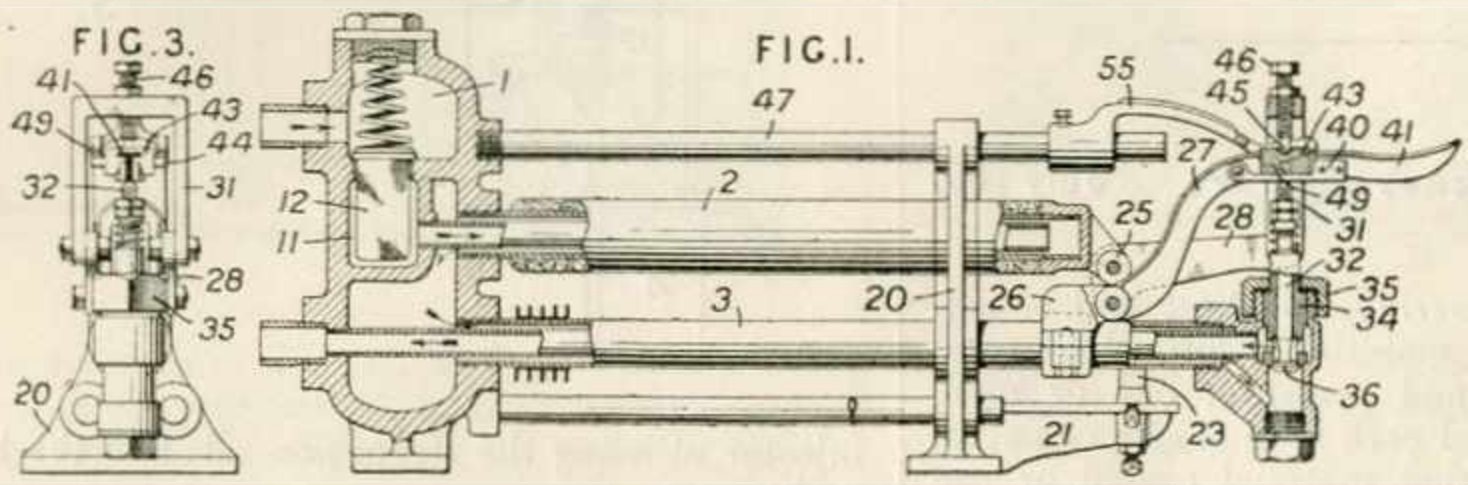
251,647. Graber, O. April 29, 1925, [*Convention date*].

Thermostats.—An adjustable mercury contact thermometer 1 is included in the circuit of a relay 8, 9 controlling a motor 21 geared to switch elements 16, 17 in the circuit of an electric heater 25 situated in a hot water radiator 26. Each room of a building may be provided with an apparatus as described, the adjusting devices for the different thermometers being mounted on a common switchboard. The space above the mercury in the thermometer may be filled with nitrogen to render sparking harmless. The elements 16, 17 and slip rings 19, 20 forming part of the motor



circuit are mounted on the motor driven shaft 18, the shaft making a half revolution after each movement of the armature 9.

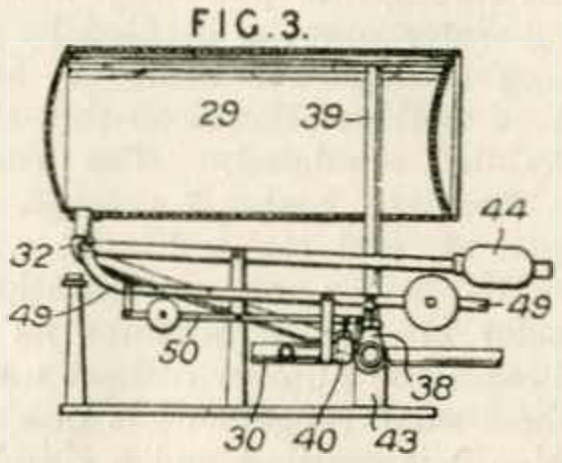
251,811. Reid, W. P. July 20, 1925.



Steam traps of the type in which a valve 36 controlling the outlet of condensed water is operated by the unequal expansion of two tube elements 2, 3, through which the steam is passed, are provided with a standard 20 in which the ends of the tubes remote from a steam chamber 1 are mounted, a bracket 21 extending forwardly therefrom to provide additional support by means of an adjustable bearing plate 23 to the end of the cooler tube. The outer ends of operating levers 28 pivoted to a bracket 25 on the tube 2 and a bracket 26 on the tube 3 are connected by an inverted U-shaped member 31 extending over the valve stem 32, and carrying a set-screw 46 which engages the upper surface of a block 43 carried by a lever 27 and having lateral projections 44. A bracket 55 adjustably mounted on a stay rod 47 terminates in a forked portion having inclines 49 engaging with the projections 44, when the apparatus becomes cold, automatically to open the valve. The upper end of the valve stem bears against a member 40 rivetted to a hand lever 41 pivoted to the lever 27, the parts being so arranged that upon manual operation of the valve, the lever 27 rises so that the bottom of a recess 45 in the block 43 does not leave the point of the set-screw 46. The valve casing is carried by the end of the tube 3 and contains a detachable seating 34 held in place by a cap 35. The steam chamber 1 contains an inner compartment 11 within which a spring-retained strainer 12 is located. In a modification the valve comprises a ball 50 supported against its seat 52 by a spring-pressed channelled cup 51 and adapted to be depressed by a vertical stem 53.

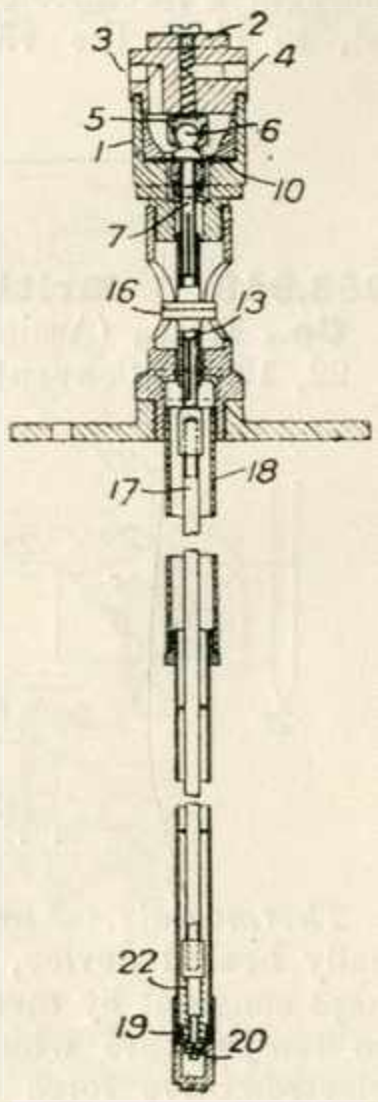
251,824. Broughton, A. E. Aug. 26, 1925.

Steam traps.—A steam trap included in the steam heating system for the drying rolls of a paper-making machine comprises a container 29 mounted upon bearings 43 so as normally to be held horizontal by a weight 44, condensed steam from the drying rolls entering the container by a pipe 30. Boiler steam is admitted to the container through a pipe 39 and valve 38 when the



container tilts due to the weight of the condensed steam therein, the water being forced out of the container through the pipe 30 and a check valve. The boiler steam is exhausted from the container through pipe 39, valve 40 and a check valve, levers 49, 50 being provided for actuating the valves 38, 40 upon tilting movement of the container.

251,875. Bakker, G. E., Kerkhoven, P., and **Henneman, K. F.** Nov. 11, 1925.



Thermostats. — A linear expansion thermostat for operating a valve comprises a rod 17 which extends through a thermostatic tube 18. The lower end of the rod extends through a nipple 19 secured to the tube 18, and carries nuts 20, while a spring 22 maintains the parts in the position shown. A collar 16 is provided with graduations indicating the temperature at which the valve is opened by the thermostat. Specification 206,834, [*Class* 38 (v), [Electric switches &c.], is referred to.

251,981. Dubois, R. May 5, 1925, [*Convention date*].

FIG.1.

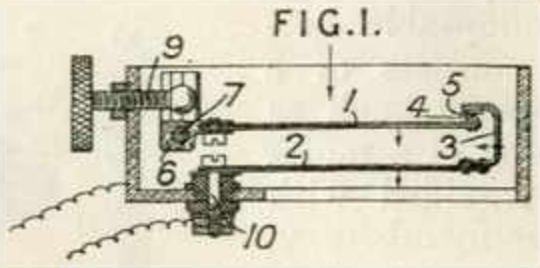


FIG.3.

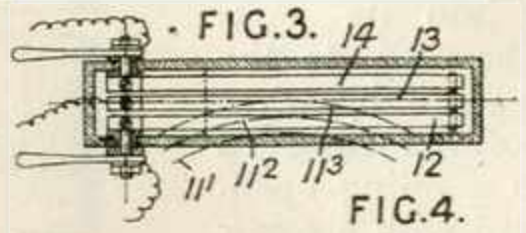


FIG.4.

Thermostats.—A differential thermostat comprises at least two bimetallic strips which operate to make or break the electric circuit of an arc when subjected to heat radiations of unequal intensity from the arc. A bimetallic strip 1 is mounted in a holder 6 pivoted at 7 and provided with a vertical extension to engage with a screw 9 for adjusting the position of the strip. A second bimetallic strip 2 is mounted on an insulated screw 10, and an electric current flows through the two strips in series when in contact. The strip 2 carries a curved member 3, and the two contacts 4, 5 are adapted to separate when the strip 1 is heated by radiation. Alternatively, the contacts 4, 5 may be adapted to complete the circuit in these circumstances. In a modification, Fig. 3, three strips, 12, 13. 14 are arranged edge to edge, and are provided with contact studs as in Fig. 4, which are adapted to contact by lateral movement. The apparatus is suitable for controlling the position of the crater of an electric arc relatively to the focus of the lens of an optical projector. Thus in Fig. 3, the thermostat is placed so that the arc 11^2 represents the correct position of the projected beam. An advancement or withdrawal corresponding to the arcs 11^3, 11^1 results in a differential heating of the thermostat, and adjustment of the arc.

252,198. Bohle, F., and **Schröder, R.** May 16, 1925, [*Convention date*].

Non-conducting coverings for heat.—Dry insulating material, such as magnesia, kieselguhr, soot, or dust from burning gases, is packed into a thin-walled metal or other container surrounding the part to be insulated. In the application to a pipe 1, divided rings 2 of low conductivity are provided to support a sheet metal container 3 having an opening 4 on its upper side to receive the packing material. The opening 4 is then covered by a plate 5. In the case of vertical pipes, Fig. 5, the adjacent sections 3 are secured by members 7, and an opening 4 may be provided for the escape of moisture, and may be closed by a removable cover 5.

FIG.1.

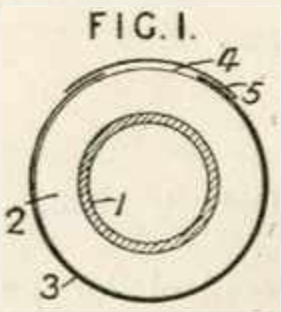


FIG.2.

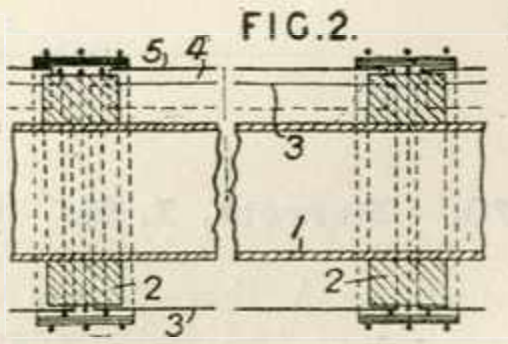
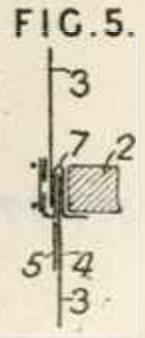
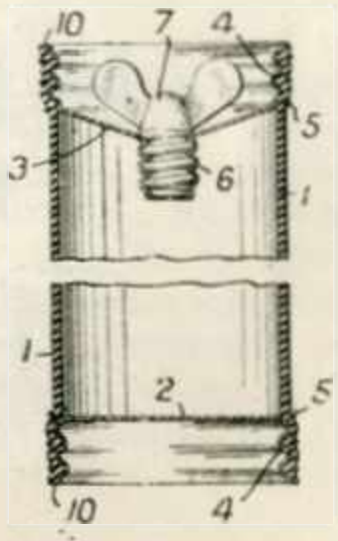


FIG.5.

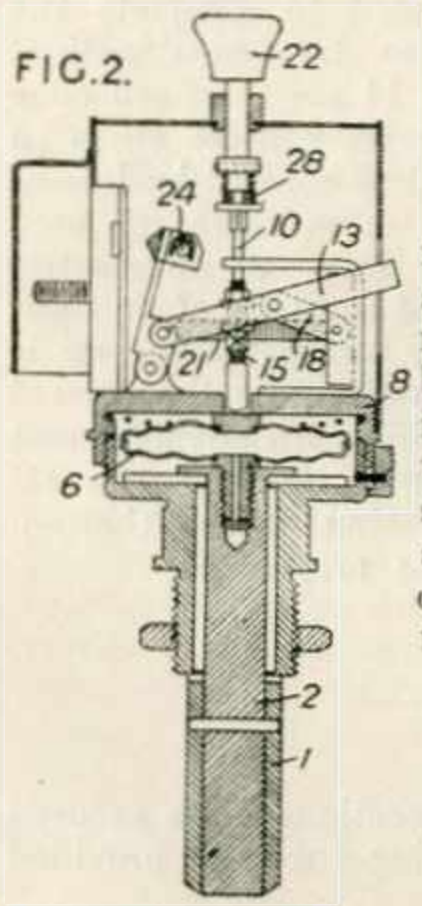


252,248. Beldam, W. R. Feb. 20, 1925.

Hot-water bags and the like. — A collapsable hot-water bottle consists of a length of tubing 1 such as the inner tubing of a motor tyre and is provided with flanged closure-members 2, 3 inserted into its ends which are secured to the grooved flanges 4 by wires 5. One closure-member 3 is sloped to a filling opening 6 provided with a screw stopper 7. The closure-members may have projecting flanges 10 against which the tubing rests and reinforcing rings may be provided inside the tubing.



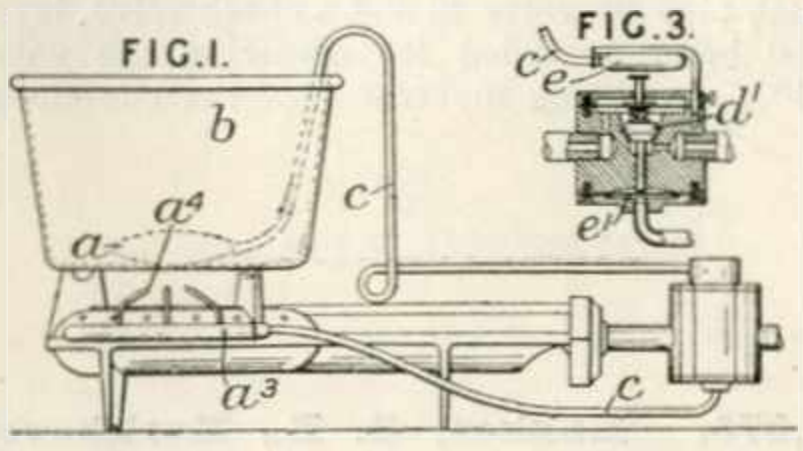
253,634. Siemens Bros. & Co., Ltd., Petithory, E. A., and **Garrod, E. R.** March 27, 1925.



Thermostats.—In thermal cut-outs which operate when portions of apparatus such as bearings become overheated, heat is absorbed from the part to be protected by a sleeve 1 of aluminium and is conducted to the capsule 6 by a copper rod 2.

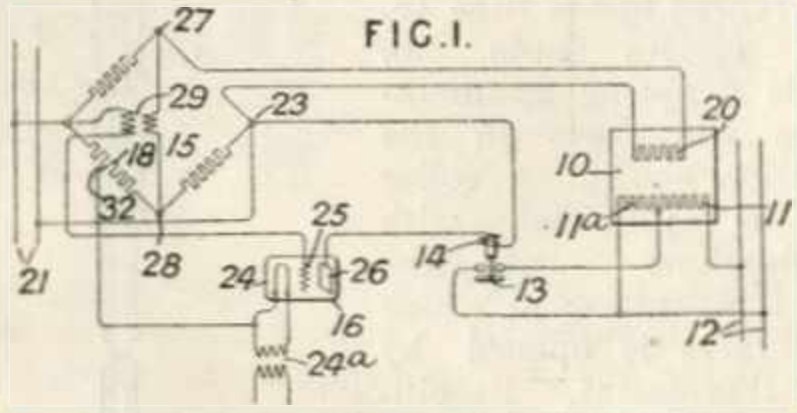
253,770. Perrett, I. G. Oct. 8, 1925.

Thermostats.—A thermostatic control for gas cocks consists of two independent air or other fluid containers, one being exposed to the liquid or substance being heated and the other to the flame, which actuate, by means of pneumatic diaphragms, a single control valve to moderate the heating when a given temperature is reached and to shut off the fuel when the flame is extinguished. The container *a* which may be of aluminium is weighted with a lead washer to rest on the bottom of the vessel *b* and is connected by a flexible tube *c* with a bulb or diaphragm *e*, Fig.



3, which can overcome the action of the diaphragm e^1, connected with the burner container a^3, to close the valve d^1.

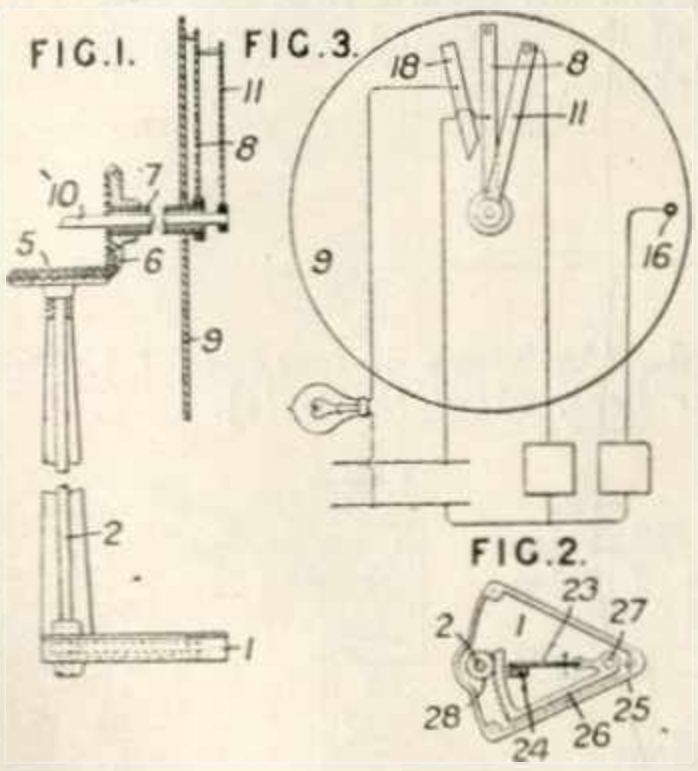
253,948. British Thomson-Houston Co., Ltd., (Assignees of *Hull, A. W.*). June 22, 1925, [*Convention date*].



Thermostats.—The temperature of an electrically heated device, e.g. a resistance furnace, is kept constant by means of a resistance responsive to temperature which varies the polarity of an electromotive force applied to the input circuit of an electron discharge device, the varying current in the output circuit being employed to control the temperature. A furnace 10 is heated by a resistance 11 supplied from mains 12, and controlled by a switch 13 which may short-circuit a section 11^a of the resistance. The electromagnet 14 which operates the switch 13 is controlled by a device operated by variations in the resistance 20, having a positive temperature coefficient, due to temperature variations in the furnace. A Wheatstone bridge 15 is connected to an alternating current supply 21, one of its resistances being the resistance 20. An electron discharge device 16 has its filament 24 connected to an alternating current supply through a transformer 24^a, while the grid 25 is connected to a step-up transformer 29 so as to be responsive to the voltage across the terminals 27, 28 of the bridge. The filament is connected to a point 32 in the resistance 18, so that the grid has a negative bias. The plate 26 is connected through the magnet coil 14 to the point 23 and thence to the supply source 21. When the furnace 10 is slightly above the predetermined temperature, the potential of 27 will be negative relatively to 28 when the point 23 and plate 26

are positive. The transformer 29 then applies a negative potential to the grid, which reduces the plate current to such a value that the magnet 14 releases the switch 13 and allows it to open. The consequent insertion of the resistance 11^a reduces the heating in the furnace. If the furnace falls below the required temperature, the potential of 27 becomes positive relatively to 28, producing a positive potential on the grid, and an increase in plate current which closes the switch 13 and short-circuits the resistance 11^a. The temperature of the furnace may be controlled within ± 0.1° C. In a modification, two stages of amplification are used, each stage consisting of a push-pull circuit, and in another modification a mercury vapour rectifier is used for controlling the supply of current to the furnace, in combination with a Wheatstone bridge, with or without a thermionic valve amplifier.

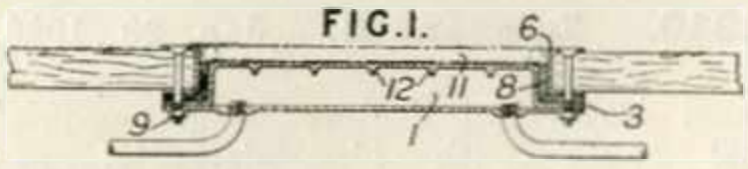
253,984. British Thomson-Houston Co., Ltd., Warren, H. W. H., Newbound, R., and **Bell, L. M. T.** March 20, 1925.



Thermostats.—A device for controlling chemical reactions accompanied by a rise in temperature, and especially for ensuring that a particular rise in temperature shall not be exceeded within a predetermined period of time, comprises a contact-member driven at a constant speed, and a second contact-member moved by temperature sensitive mechanism behind and along the same path as the first contact-member, the arrangement being such that should the second member overtake the first an electric circuit is completed whereby corrective devices are brought into play. A spindle 2, Fig. 1, the movements of which are transmitted by gearing 5, 6, to a sleeve 7, is adapted to be turned by temperature-sensitive mechanism 1 located in the medium to be controlled. The sleeve 7 carries an arm 8 and is traversed by a spindle 10 driven at constant speed and carrying an arm 11. The arm 8, Fig. 3, normally moves over a dial 9 along the same path as and behind the arm 11, and if, on account of a too rapid rise in temperature, the arm 8 overtakes the arm 11 an electric circuit is completed and a corrective operation, such as cessation of heating, is automatically performed. The dial 9 may carry a contact 16 arranged to be cleared by the arm 11 but to be engaged by the arm 8 should the temperature continue to rise, the engagement of the arm 8 and contact 16 completing a circuit whereby cooling fluid is caused to be supplied to or around the reaction vessel. Also, a second contact-carrying arm 18 may be mounted on the spindle 10 so as normally to move behind the arm 8, the arrangement being such that, should the temperature rise too slowly so that the arm overtakes the arm 8, a circuit is completed whereby other corrective means are operated. The temperature-sensitive mechanism 1 may comprise, as shown in Fig. 2, a bimetallic strip 23 fixed at one end 24 to a casing 25 and free to bend with variations in temperature so as to operate a quadrant-shaped rack 26 pivoted to the casing at 27 and engaging a pinion 28 on the spindle 2. Specification 225,011 is referred to.

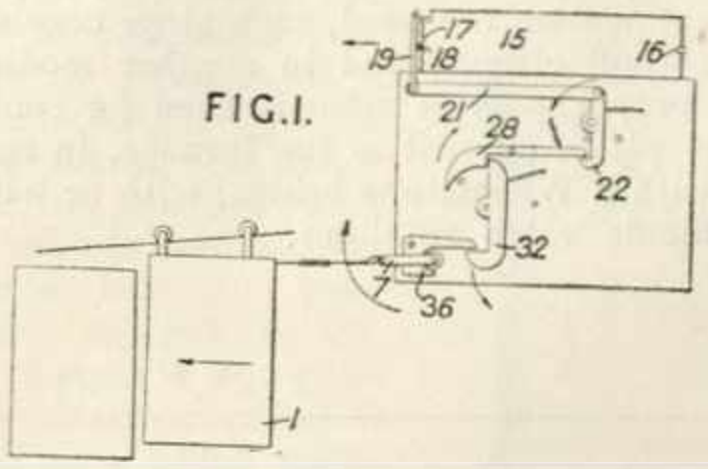
254,120. Watson, H. July 28, 1925.

Radiators.—A heater for motor vehicles is provided with a covering mat of porous, spongy, or openwork metal to equalize the heating. The heater 1 is provided with a flange 3 and detachable bottom 1 which are secured to a frame 6 of channel section by bolts 9. Heat insulation 8 is interposed between the heater and frame. A recess between the heater and the floor level of the vehicle contains a mat 11 of coiled metal wire or strip, or similar openwork metal. Internal ribs 12 are provided. In a modification, the frame 6 is omitted and a recess is formed in the top of the heater, while the bottom of the heater may be corrugated.



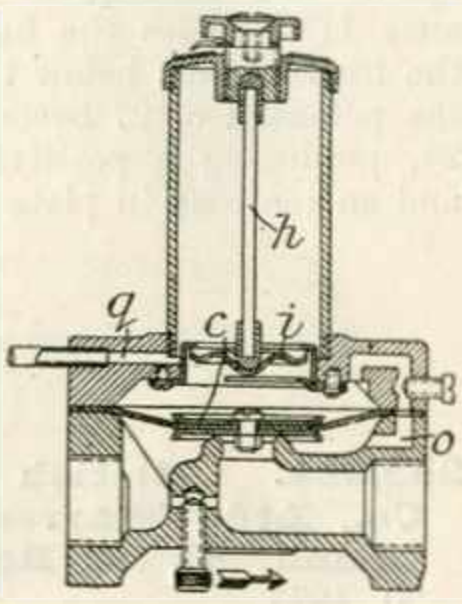
254,346. Thermosonus, Soc. Anon. June 29, 1925, [*Convention date*].

FIG.1.



Thermostats.—Mechanism for holding a fire-protection door or screen in open position is released on a rapid rise in temperature by a fluid-expansion chamber, which is arranged to be inoperative for gradual heating. An expansion chamber 15, Fig. 1, has a small outlet orifice 16 and a deformable wall 17 carrying a button 18. On a rapid rise in temperature the small orifice 16 delays equalization of pressure, and the wall 17 is deformed to operate lever mechanism.

254,644. Kromschroder Akt.-Ges., G. Oct. 28, 1925, [*Convention date*].



Thermostats. — A thermostatic regulator applicable for controlling the flow of gas to the gas-heating system of a room comprises a diaphragm valve *c* controlled by an auxiliary valve *i* which is governed by a rod *h* connected to the free end of a hard rubber tube that is exposed to the temperature of the room. The diameter of the tube is relatively large, the external diameter being preferably greater than one-fifth of the free length of the tube, and more than twelve times the thickness.

255,106. British Thomson-Houston Co., Ltd., (Assignees of *Ipsen, C. L.*). July 10, 1925, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

FIG.2.

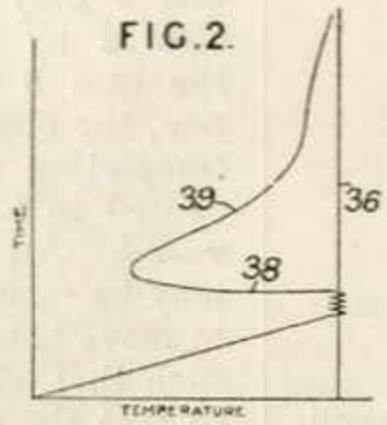
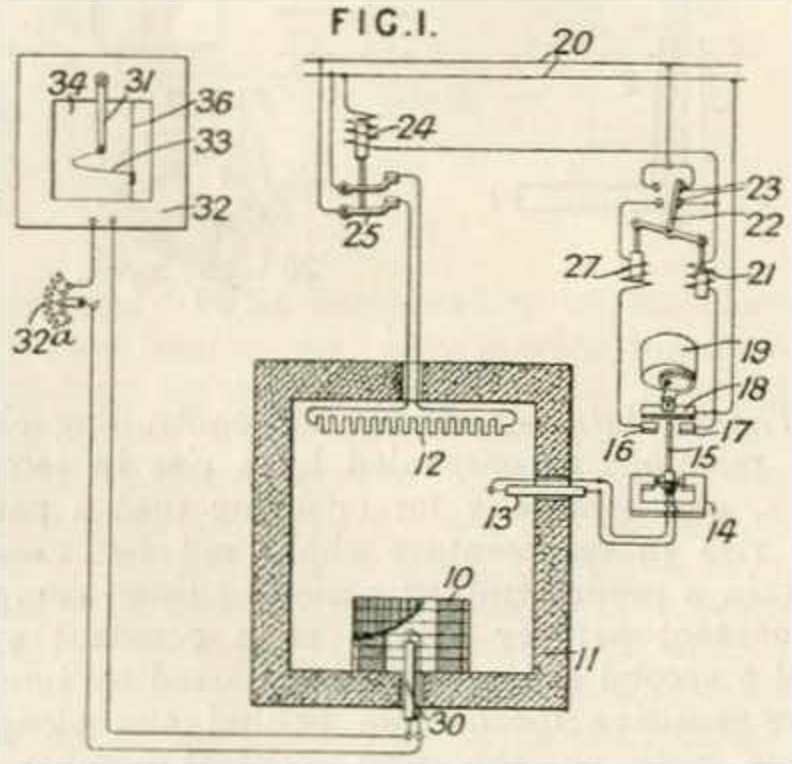


FIG.1.



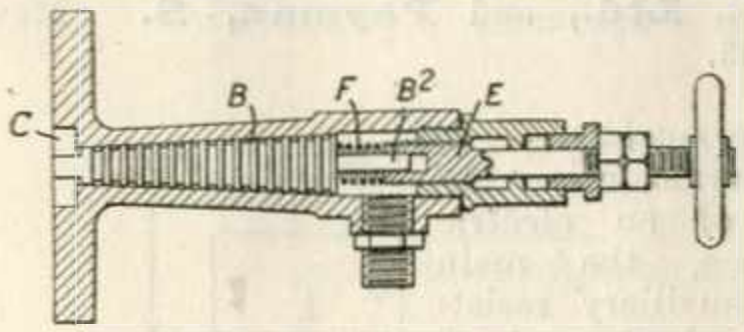
Thermostats.—The temperature of a furnace 11, in which gear wheels 10 are placed for heat-treatment, is controlled by a pyrometer 13 in the form of a thermocouple connected to a galvanometer 14, the pointer 15 of which is arranged so as to swing over contacts 16, 17. Co-operating with these contacts is a reciprocating contact 18 adapted to be moved towards or away said contacts by an electric motor 19. The contacts 16, 17 are arranged so that when the furnace has reached the desired temperature, the pointer 15 is midway between them. If the temperature of the furnace increases, the pointer 15 will be moved over the contact 17 and squeezed between this contact and the reciprocating contact 18, thus closing a circuit from the supply source 20 which energizes a coil 21 and causes a switch arm 22 to move out of contact with contacts 23, de-energizing a coil 24, thus opening a switch 25 which disconnects the resistance heater 12 from the supply 20. As the temperature of the furnace 11 falls, the pointer 15 will move over the contact 16 and will be squeezed between the contact and the contact 18, thus energizing a coil 27 and causing the arm 22 to move and engage the contact 23, thus connecting the heater 12 to the supply 20 again.

255,340. Lassen, E. Jan. 28, 1926.

Steam traps.—In a steam trap comprising a conical plug with circumferential grooves, mounted in a casing, the plug is free to act as a non-return valve independently of its hand control. The conical plug B is provided with a stem B^2 longitudinally movable in a recess in the screwed spindle E which determines the maximum opening of the plug, so that the plug may move under the influence of back pressure to close the inlet C. A return spring F may also be provided.

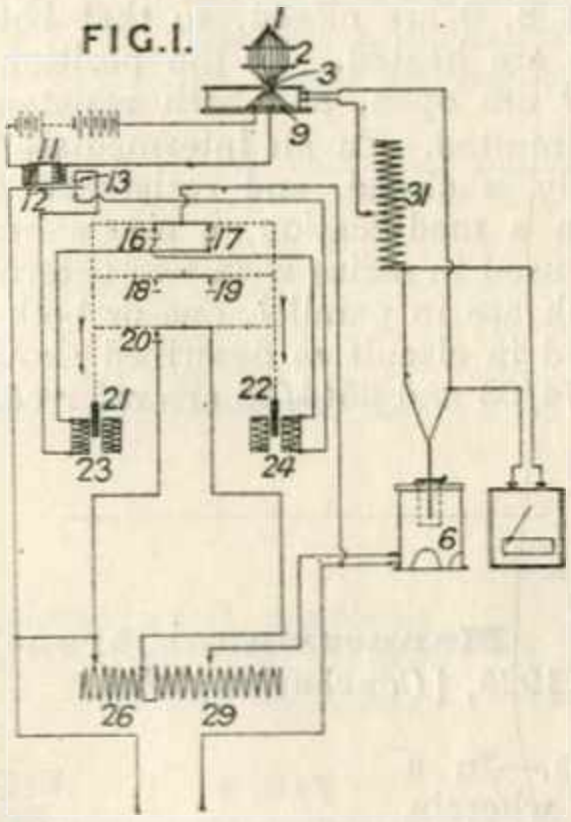
(*For Figure see next page.*)

255,340.



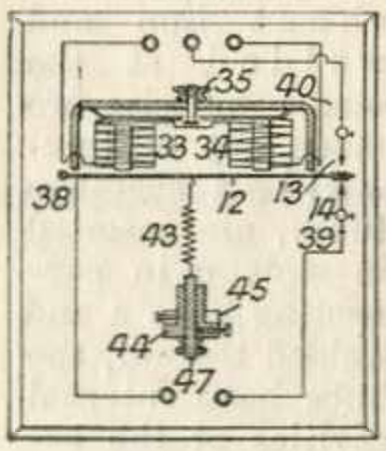
255,405. Etablissements Poulenc Frères, and **Chagnaud, A.** July 17, 1925, [*Convention date*].

FIG.1.



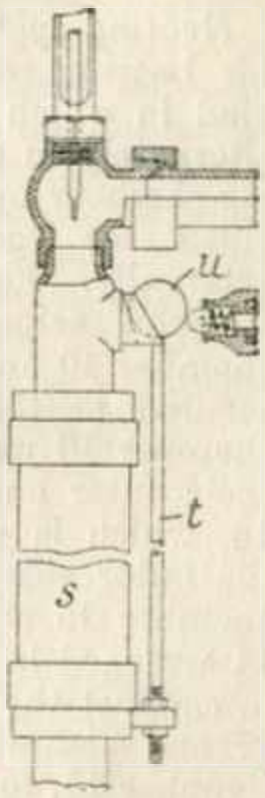
Thermostats.—An apparatus for controlling an electric or other furnace comprises a temperature indicator, the needle of which masks or unmasks a photo-electric cell which controls the heating device of the furnace. A luminous source 1 is placed in front of a condenser lens 2 which causes convergence of the light on a window 3 formed in the dial of a galvanometer actuated by a pyrometer in a furnace 6. The light may be obstructed by a plate carried by the galvanometer needle when the temperature reaches a certain point. The light is received on a selenium cell 9 connected with a relay 11 so that the movable plate 12 makes a contact 13 when the temperature of the furnace is too low. The relay controls a series of contacts 16 - - 20 by the aid of mercury interrupters moved by iron cores 21, 22 in solenoids 23, 24. Contacts 16, 17, energize the solenoids, contacts 18, 19 operate visible or audible signals, and contact 20 acts on the heating resistance or other controlling means of the furnace. If contacts 16, 18, 20 are closed and contact 13 is made, a resistance 26 in the heating circuit is short-circuited and the resistance 29 causes a rise in temperature. If contacts 17, 19 are closed and contact 13 is made, solenoid 23 is energized and contacts 16, 18, 20 are thereby closed, and contacts 17, 19 opened, the resistance 26 being again short-circuited. If the furnace becomes too hot, contact 14 is closed, solenoid 24 is energized, and contacts 17, 19 closed and 16, 18, 20 opened, so that the resistance 26 is placed in circuit and the temperature falls. The window in the galvanometer may be adjustable, or if fixed, a variable resistance 31 is inserted in the pyrometer circuit to enable the temperature control point to be adjusted. Fig. 3 illustrates the relay 11. An electromagnet 33, 34 is adjustable by a knob 35 with respect to an armature 12, pivoted at 38. Contacts 13, 14, are adjusted by knobs 39, 40. The plate 12 is balanced by a spring 43 attached to a member 44, which is movable in a slide 45 to give a coarse adjustment. Fine adjustment is effected by a micrometer screw 47. The apparatus may also be used for controlling a valve or by-pass for gas, steam, or the like.

FIG.3.



255,613. Bagley, S. June 27, 1925.

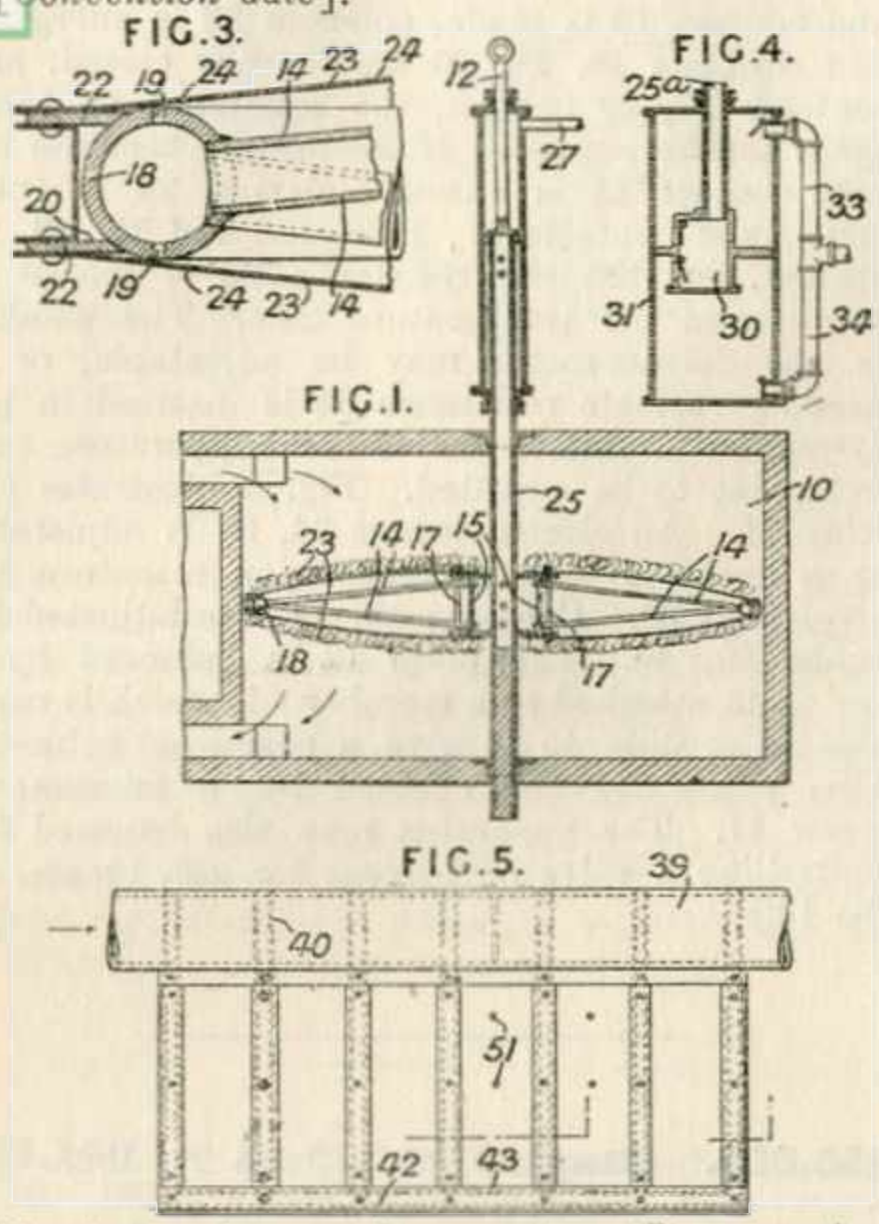
Thermostats.—A valve device for mixing hot water or steam with cold water is controlled by the expansion of a copper pipe *s* forming part of the outlet conduit, acting through a steel rod *t* provided at its upper end with a ball or wedge *u* engaging the valve spindle.



255,678. Leyland & Birmingham Rubber Co., Ltd., and **Anderson, G.** Sept. 17, 1925. *Drawings to Specification.*

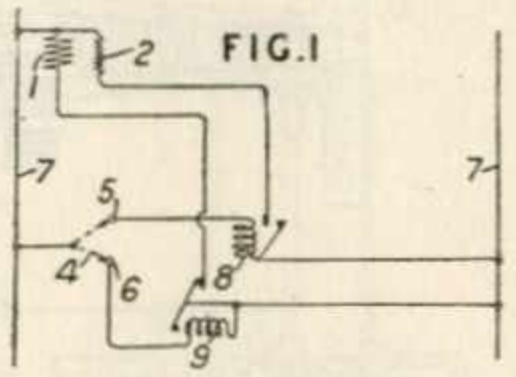
Hot-water bottles. — The ferrule of a rubber hot-water bottle is made of oval shape and is formed on its outer surface with both vertical and horizontal corrugations to facilitate its attachment to the neck of the bottle.

255,866. Puening, F. July 24, 1925, [*Convention date*].



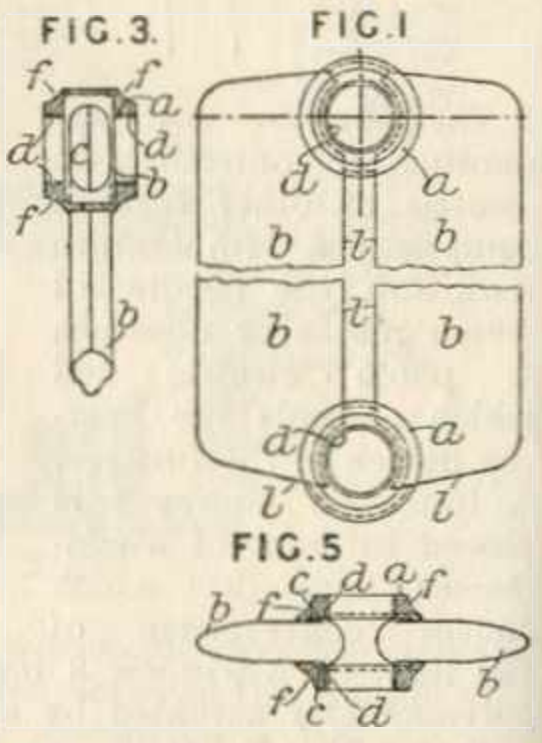
Heating systems and apparatus.—In apparatus for heating retorts, leers, and the like, of the kind in which a body of heating-gases is passed alternately in opposite directions through a heating-chamber by a movable piston, means are provided for cooling the piston internally and externally. Fig. 1 shows the invention applied to a piston reciprocated vertically by a rod 12 in a chamber 10 and built up of thin metal plates 23 secured at their inner ends by bolts 17 to a chamber 15 welded to the hollow rod 25, and at their outer ends to members 22 welded to pipe 18, which is perforated at 19 and protected on the outer side by insulating material 20. The chamber 15 and pipe 18 are connected by tubes 14 arranged in the manner of spokes and serving to conduct the cooling fluid, which is supplied at 27 and passes down the hollow rod 25 into the chamber 15, to the pipe 18 from which is escapes through the apertures 19 to the interior of the piston; apertures 24 are provided in the plates 23 to allow some of the fluid to pass to the exterior of the piston. Fig. 4 shows a modification in which the cooling medium is supplied from below to the hollow piston-rod 25*a*, the latter communicating with a valved chamber 30 which functions as a piston within a cylinder 31 to which the fluid is supplied by branches 33, 34 closed by flap valves. The invention is shown in Fig. 5 applied to an oscillating piston built up of thin plates perforated at 51, the cooling fluid, in this case, being supplied to the interior of the piston from the hollow shaft 39 which communicates through internal pipes 40 with a header 42 having apertures 43 for the pasage of the fluid. Specifications 208,170, and 210,758, [*Class* 51 (ii), Furnaces and kilns for applying &c.], are referred to.

255,977. British Thomson-Houston Co., Ltd., and **Payman, S.** May 11, 1925.



Thermostats. — In a thermostatic control of an electric furnace, the main and auxiliary resistance windings 1, 2 are connected in parallel through relay switches 8, 9 between the mains 7. A thermostatic switch 4 has two operative positions 5 when the furnace temperature is below a predetermined point, and 6 when it is above a predetermined higher point. In the position 5, both relays 8, 9 are closed, so that both resistances 1, 2 are heated. In the position 6, both relays 8, 9 are open, and both resistances 1, 2 are open-circuited. In an intermediate position, relay 9 only is closed, and resistance 1 only is heated. In a modification, a single heating resistance is used in series with two external resistances which are in parallel, one or both of these being placed in circuit as described above. Specifications 774/03 and 3544/08 are referred to.

256,185. Mannesmannröhren-Werke. July 30, 1925, [*Convention date*].



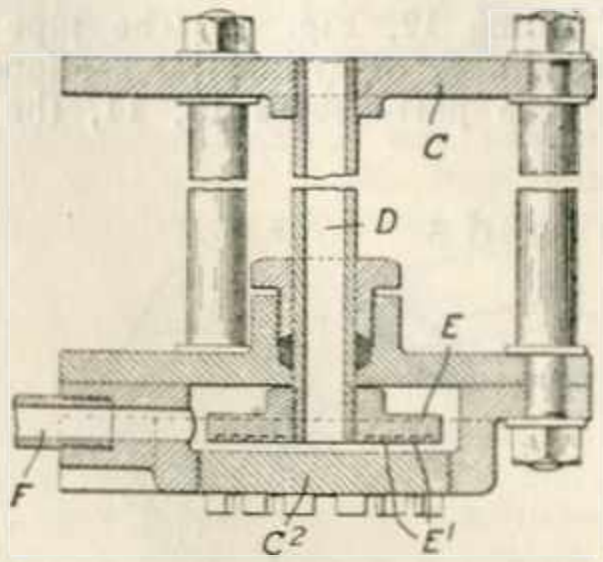
Radiators.—In a radiator wherein the tubes *b*, which are pressed out of sheet iron and welded at the seams or else are made out of thin-walled seamless tubes, are inserted in slots *c* in connecting hubs *a* and welded thereto, the hubs have internal cavities of the external breadth of the tubes so that the lateral sides thereof will support and guide said tubes over a wide surface and so relieve stresses at the welded joints. The edges of the hubs are shaped or recessed as at *f*, Fig. 5, so as to reduce the thickness of the metal at the weld to equal the thickness of the wall of the tube to be welded and thereby obviate subsequent stresses at the joints due to non-uniform heating. The welded seams *l* at the bottom of the radiator tubes are inclined as shown in Fig. 1 in order that condensed water may run away freely. The hubs are thickened and screw-threaded at *d* for connection to similar units.

256,256. Armstrong, C. C. Aug. 3, 1925, [*Convention date*]. *Drawings to Specification.*

Thermostats.—The Specification as open to inspection under Sect. 91 (3) (a) includes the subject-matter of Specification 276,362. This subject-matter does not appear in the Specification as accepted.

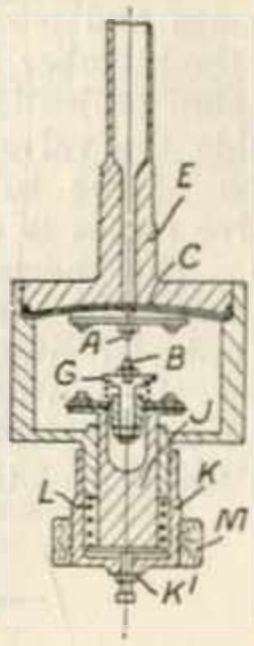
256,381. Armstrong, C. H. July 7, 1925.

Steam traps.—A steam trap employs a disc lift valve E with labyrinth grooves E^1 between it and its seating C, carried by a hollow stem D to which the steam has access so that the position of the valve relatively to its seating is adjusted automatically according to the expansion of the hollow stem. Water is discharged through the outlet F. The screwed plug C^2, forming the seating, is adjustable to or from the valve member E.



256,546. MacLaren, R. Dec. 31, 1925.

Thermostats. — A parabolic diaphragm C is operated by the expansion of a liquid in a container E.



256,624. Siemens - Schuckertwerke Ges. Aug. 7, 1925, [*Convention date*].

Thermostats. — In the regulation of power installations by the temperature of the driving medium through the agency of the vapour pressure of a higher boiling point liquid acting through a transmission liquid upon regulating devices, an auxiliary tank is inserted between the boiling and transmission liquids, and is arranged above the level of liquid in the boiling tank from which a pipe communicates with that part of the auxiliary tank above the level of transmission liquid therein. Vapour generated in a vessel 3 bathed in the driving medium passing through a conduit 1 exerts a variable pressure according to the temperature of the driving medium, upon the surface 10 of transmission liquid in a balance tank 8, this pressure being communicated to a diaphragm 6 having a control rod 7. To regulate within a certain range of temperature only the apparatus is arranged so that before the regulating device begins to operate the pressure of a column of the transmission liquid must be overcome, this pressure corresponding to the minimum temperature of the range. When, owing to a difference in levels, the pressure head, e.g. of mercury as the transmission liquid, would be too great for the lower limit, a lighter liquid, e.g. oil, is interposed between the boiling and transmission liquids. This lighter liquid is contained in balance tanks 11, 12 connected together by a pipe 13. Specifications 3179/90 and 236,716 are referred to.

FIG.2.

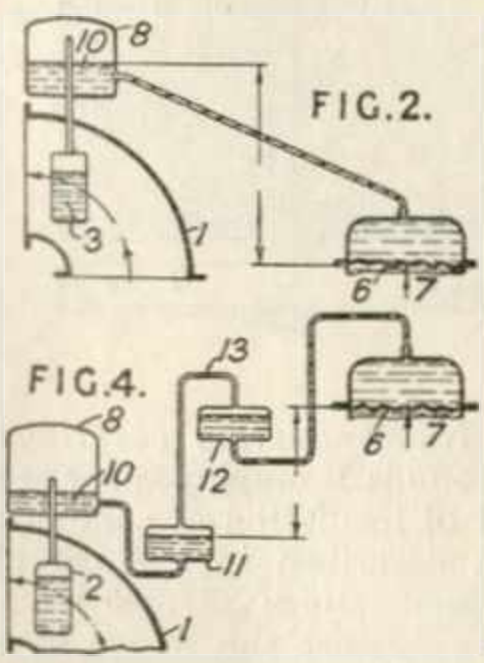
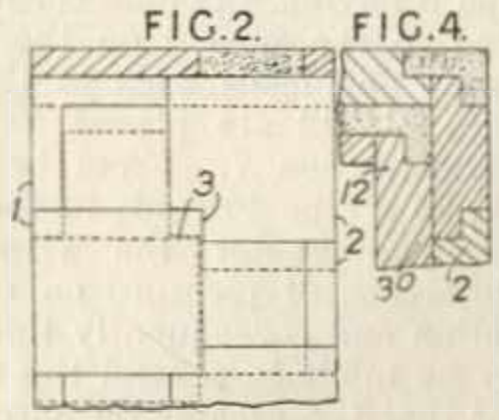


FIG.4.

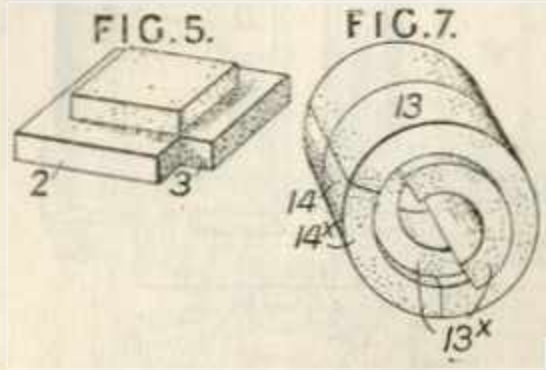
257,145. Kent, G. E. Dec. 8, 1925.

FIG.2. FIG.4.



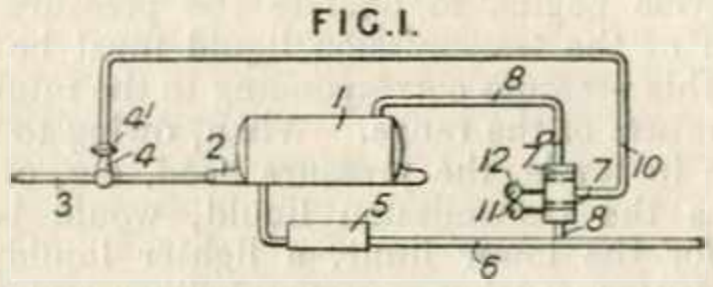
Nonconducting coverings for heat.—Linings for the walls and covers for the pipes of cold storage chambers comprise blocks or slabs 1, 2, Figs. 2 and 4, and part sleeves 13, 14, Fig. 7, of cork or similar material having rabbeted edges, which overlap one another so as to provide a broken interlocked joint when the blocks and part sleeves are assembled. Preferably, the wall lining is composed of two layers 2, 3^0, Fig. 4, of the blocks

built up in vertical rows, and the blocks of alternate rows have their corners notched out as at 3, Fig. 5. The corner joints are completed by cement &c. filling 12, Fig. 4. The pipe cover comprises a number of cylindrical sections each composed of the part-sleeves 13, 14, the outer



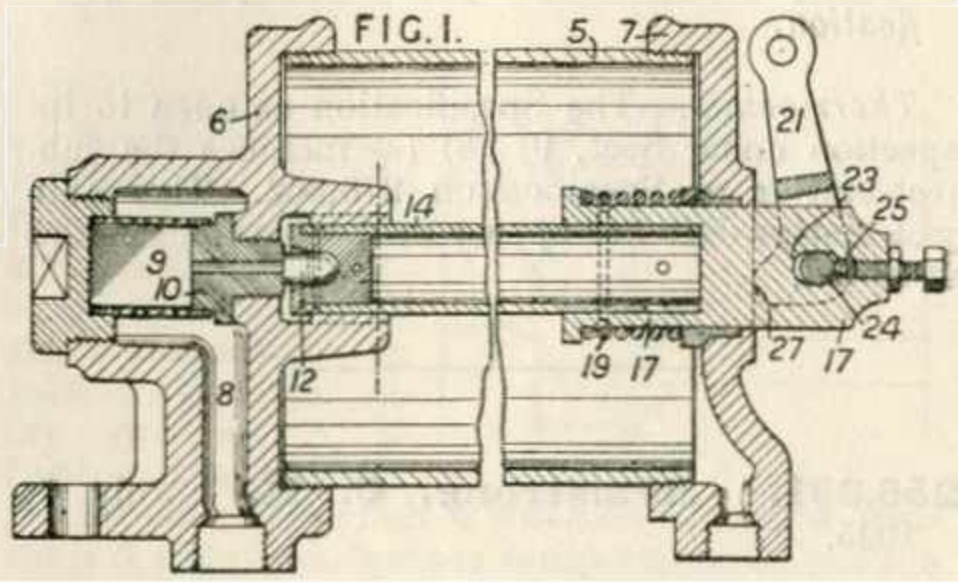
part 14^x of one part-sleeve 13 being circumferentially greater than the outer part of the other part-sleeve 14, while the inner parts 13^x meet along a diametral joint but are alternately recessed and extended beyond the end of the section.

257,352. Leask, J. P., and **Warner, S. T.** June 2, 1925.



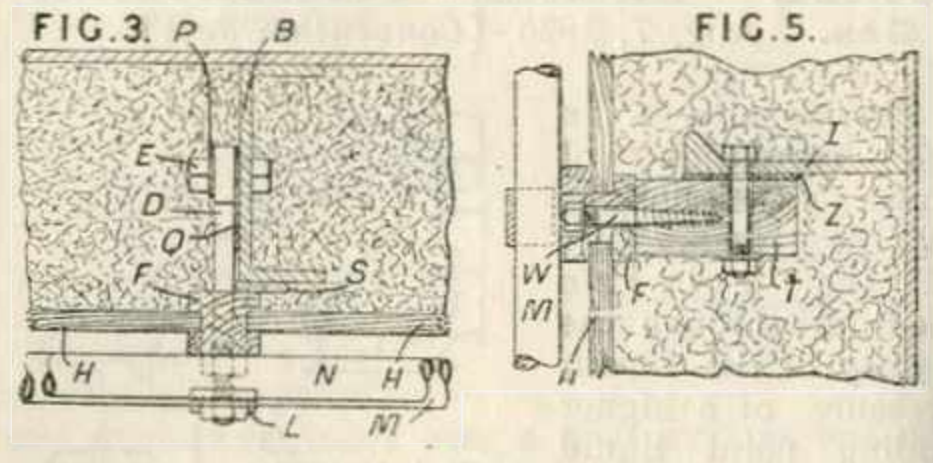
Thermostats.—The viscosity of a fluid is controlled by varying the temperature of the fluid and regulating the variation of the temperaure by the viscosity of the fluid itself. A fluid tank 1 is provided with a heater 2 supplied with a heating medium through a pipe 3 and valve 4 which may be hand controlled or controlled automatically by pressure. A pump 5 forces fluid from the tank through the pipe 6 to a place where the fluid is in use. A pipe 8 having a double constriction 7, 7*a* is connected to the pipe 6 on the discharge side of the pump and leads back to the tank 1. Pressure gauges 11, 12 are placed on opposite sides of the constriction 7. From between the constrictions 7, 7*a* a pipe 10 leads to the pressure regulator 4^1. The greater the viscosity, the greater the difference of pressure on either side of the constriction and consequently this pressure difference may be made to control tha valve 4 in such a manner that the greater the viscosity, the larger amount of heating medium is passed, the effect being to reduce the viscosity. In a modification, the gauges 11, 12 are placed on opposite sides of a constriction in the pipe 6 and the valve 4 is controlled by hand. In other forms, a long length of pipe 6 is included between the gauges; the heater is placed on the delivery side of the pump; and the method is applied to an open tank feeding by gravity.

257,455. Cross, J. W. Nov. 13, 1925.



Thermostats.—Steam heaters for railway carriages having a thermostatic control of the kind described in Specification 173,370 are provided with a cam device associated with the end of the thermostat which projects through the casing, to adjust the valve to open at a given temperature. A forked lever 21 has a pin 24 connecting the prongs and passing through a slot 23 in the end of the member 17 which is embraced by the fork. A cam projection 27 bears against the cap 7 and holds the valve open until closed by the expansion of the tube 14. The point at which the valve closes is determined by an adjusting screw 25. The thermostatic control can be placed out of action by turning the lever 21 so that the cam is out of contact with the cap 7. In a modification, the pin 24 is pivoted in lugs on the cap 7, and has eccentric portions engaging with a nut on the end of the member 17.

257,723. Thomson, E. A. Aug. 8, 1925.
Addition to 224,716.

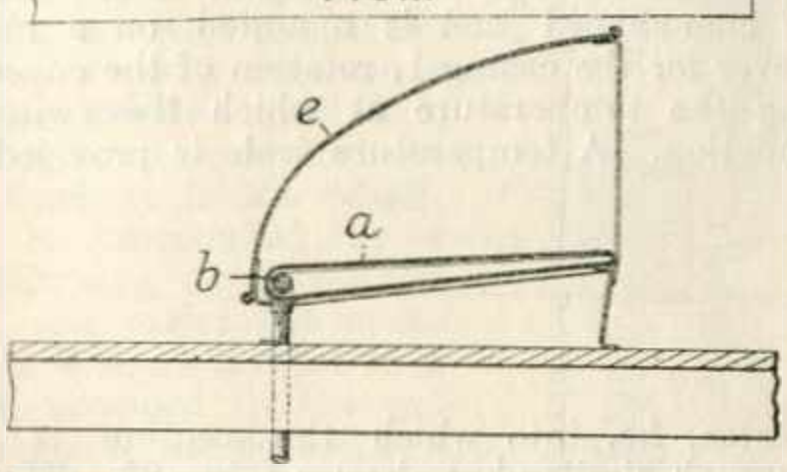


Nonconducting coverings for heat.—The wood grounds F employed for securing the panel linings H of insulation of cold-storage chambers or holds as described in the parent Specification and in Specifications 232,385 have a flat inner face resting against the flange of a beam or stiffener B, Fig. 3, or against a block or chock T, Fig. 5, secured to the side of a bulb-iron or like stiffener I, so as to be laterally adjustable. The grounds may be secured by hanger-bolts D, Fig. 3, which may be extended to carry clips or brackets L for brine pipes and meat rails M, N. In such case

the grounds may be drilled in the factory for the positions of the hanger bolts, which are attached to the beams by bolts E. Fibre liners S may be placed between the grounds and the beam flanges for adjustment outwards. Asbestos washers or liners P, Q may be fitted between the metal frame and bolts to reduce heat losses, and similar liners Z, Fig. 5, may be employed between the chocks and frames on bulkheads adjoining coal bunkers, to serve as protection against fire. Where wood chocks T are used, the wood grounds are secured to them by coach screw studs W. Such chocks may extend the full depth of the insulation and be secured by bolts to angle-iron stiffeners of the outer plating, a layer of asbestos mill board being used between the chock and the metal. The grounds and wood chocks may have clearance around the bolts or studs for adjustment.

258,173. Still & Sons, Ltd., W. M., and **Still, E. H.** March 25, 1926.

FIG. 1.



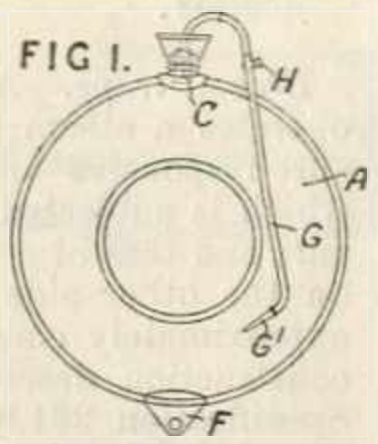
Radiators.—A flat-tubular bodied radiator *a* for fitting under the seats of railway-carriages is provided with a deflecting plate *e*. The tubular body may have pressed-out ribs and the supply tube *b* may pass centrally along the body, the surface being curved outward to accommodate it.

258,322. Forbes, C. June 13, 1925.

Hot-water bags and the like.—A surgical douche comprising an annular rubber or like flexible container may be used as a hot water bottle or cushion.

Reference has been directed by the Comptroller to Specifications 21841/94; 2740/98, [*Class* 81, Medicine &c.]; 19862/99, 14860/01, *and* 17485/07.

FIG 1.



258,413. Popescu, T., Pais, A., and **Pais, C.** Aug. 26, 1925.

Heat-storing apparatus.—A heating device comprises a heat conducting block heated at one side and provided with a system of interconnected passages charged with a volatile liquid which transmits heat to other parts of the block where it is to be utilized. In the application to a cooking stove, a metal block *x* is heated by a fire on a grate 20, the hot gases passing through longitudinal flues within the block. The block is enclosed in an insulated chamber 30 closed at one end by a lid 32, and having an oven 31 on the upper side of the block. The upper side of the chamber is also provided with openings 35, 36, 37 which are closed by removable sliding covers 45, 46, or a conical plug 47, so that cooking utensils may be placed on the block *x*. The utensil may

FIG. 1.

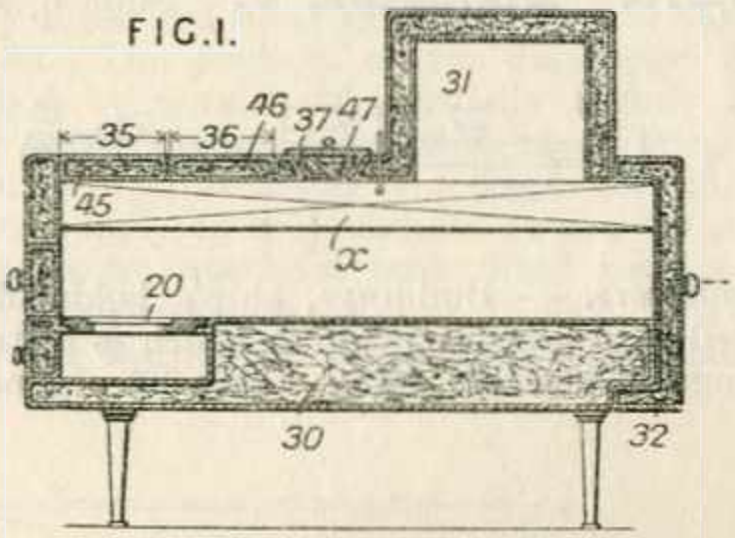


FIG. 7.

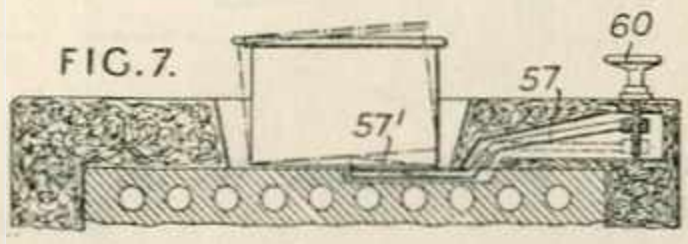
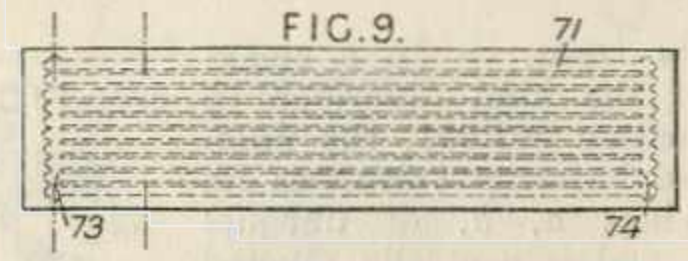


FIG. 9.



be placed to a greater or less extent in contact with the block to regulate the heating, or it may be tilted by a lever 57, 57¹, Fig. 7, operated by a screw 60, to interpose a variable film of air between the utensil and the block. The block is preferably of cast iron or steel with a system of closed longitudinal and transverse passages 71, 73, 74, Fig. 9, or with an upper and a lower series of passages of different diameters. The temperature-equalizing medium, which may be alcohol or water, is sealed into the passages. Those parts of the block *x* from which heat is taken may be ground smooth, or a conducting film of fusible metal may be provided.

258,433. Downs, C. R. Oct. 7, 1925.

Heating systems.—Heating is effected by boiling sulphur, and the temperature is varied by varying the pressure under which the sulphur is boiled.

259,136. Ebmeier, W. May 1, 1926.

Hot-water bottles of rubber, rubber composition, or the like for personal use are provided on the surface which is to be applied to the body with ribs, nipples, &c. *a* and with an edge or border *c* which protects the body against air currents. Small air ducts *d* may be arranged in the border to conduct away perspiration.

FIG. 1.

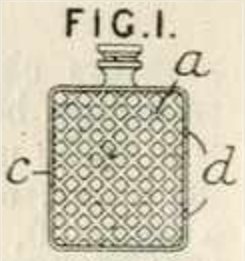
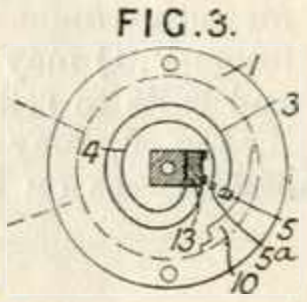


FIG. 2.

259,229. Bouillon, Y., and **Bouillon, J.-M. F.,** (*trading as* Etablissements Bouillon Frères). Oct. 2, 1925, [*Convention date*].

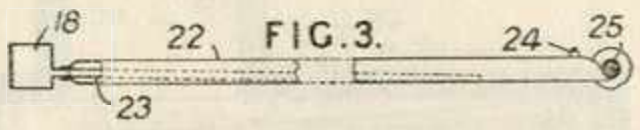
Thermostats. — A thermal switch comprises two coiled bimetallic elements 3, 4 carrying respectively contacts 5, 5^a and insulated from one another by a block 13. The spiral 4 has a smaller section than the spiral 3, so that on rapid heating the contact 5^a overtakes the contact 5, closing a circuit through the spirals and terminals connected to them. On slow heating the spirals remain parallel until the contact 5 reaches a contact 10, when a circuit is closed through the casing 1. The contact 10 is cam-shaped and is mounted on a rotatable cover for the casing 1, rotation of the cover varying the temperature at which the switch will function. A temperature scale is provided.

FIG. 3.



259,270. Elkington, V. June 6, 1925.

FIG. 3.

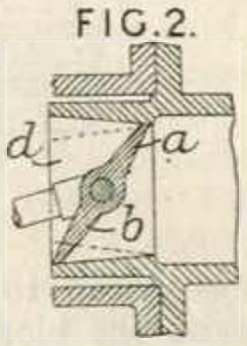


Radiators. — Buildings, ship's holds, &c. are heated by a gaseous medium which is distributed through collapsable porous tubes 22 of linen, asbestos, &c. into which the medium is forced through similar but shorter tubes 23. The tubes 22 are provided with safety valves 24 and connected at one end to nozzles formed upon a supply main 18 and at the other to a shaft 25 upon which they can be wound when not in use. The tubes 22 may be provided with two internal coaxial tubes, and instead of being attached to the shaft they may be connected at their centres to lifting cords.

259,330. Millington, W. E. W. July 22, 1925.

Steam traps. — In a steam trap of the kind described in Specification 201,951, the float-operated butterfly valve has its two wings *a*, *b*, of unequal length, and is centrally pivoted in the passage *d*. The passage is either converging or diverging, and the pressure on the unequal wings of the valve assists or retards the closing respectively. Alternatively, the valve may be mounted in a passage with parallel walls, the pivot in this case being necessarily eccentric.

FIG. 2.



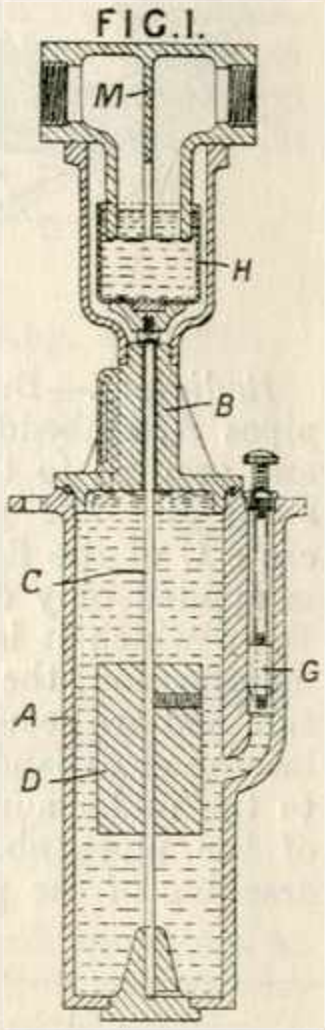
259,585. Ludeman, O. H. May 28, 1924, [*Convention date*]. *Drawings to Specification.*

Steam traps.—A condensate-controlling device operates a steam shut-off valve through a pressure-responsive member such as a diaphragm which is subjected on one side to the fluid pressure and that of a varying head of condensate and on the other side to the fluid pressure and an approximately constant hydrostatic head. The construction described is identical with that in Specification 234,817. Emergency operation of the shut-off valve can be effected through fluid pressure by direct or electric means. The automatic means for actuating the shut-off valve on over-speeding the engine driven from the steam line comprises a spring-held arm on the engine shaft which swings out centrifugally to trip a lever controlling the operation of the shut-off devices.

259,680. Salerni, P. M. July 16, 1925.

Thermostats. — A thermostat suitable for regulating the temperature of the oil used to heat a vulcanizer, for example, by controlling the fuel supply to the oil-heater, comprises a vessel A containing mercury, the level of which rises into the neck B of the vessel so that a small change in the volume of the mercury effects a substantial change in its level, and a submerged member D which is adjustably secured to a rod C. The rod passes through the neck of the vessel and at its upper end supports a mercury cup H which rises and falls according to the temperature of the mercury in the vessel, which is surrounded by a jacket through which the oil passes, and varies the opening in a V-notch formed in a web M arranged in the gas supply pipe to the heater. The level of the mercury in the neck, which is provided with a gauge, can be adjusted by the screw-actuated piston G.

FIG. 1.



260,013. Hall, D., Kay, J. H., and Hall & Kay, Ltd. June 17, 1925.

Thermostats.—An apparatus for automatically controlling temperature and like conditions has a valve or switch actuated by hydraulic pressure acting on a double acting piston normally occupying a central position in its cylinder and under the control of an auxiliary valve itself controlled by a second auxiliary actuated by the condition to be regulated. The Figures show the application of the invention to a pressure regulating valve 5 which may be replaced by a rheostat controlling an electric heater and which is connected by chain-and-sprocket gearing to rods 8 on the piston 7. The two ends of the cylinder are connected by pipes 11^a, 12^a to a four-way cock 13 having a pressure inlet connection 14 and exhaust connections 19. The cock casing has twin passages 11^b, 11^c and 12^b, 12^c leading to the pipes 11^a, 12^a respectively and the plug has two parallel passages 13^b, 13^c each connected by passages 13^d, 13^e, at right angles so that by manipulating the cock the two sides of the piston 7 are alternately connected to pressure and exhaust. The cock 13 is actuated by pressure from a conduit 29 acting on a diaphragm 32 against the action of a spring 33^a, which diaphragm is connected to the cock by a toothed member 34 engaging a toothed wheel 35. The pressure on the diaphragm 32 is controlled by a valve 26 normally slightly open and actuated against the action of a spring 24^a by conduit pressure acting on a diaphragm 23. The pressure supply to the conduits 14 and 29 is derived from an overhead tank fitted with a ball cock and passes through filters 15, 30. The connection for the conduit 14 is made to the bottom

FIG. 1.

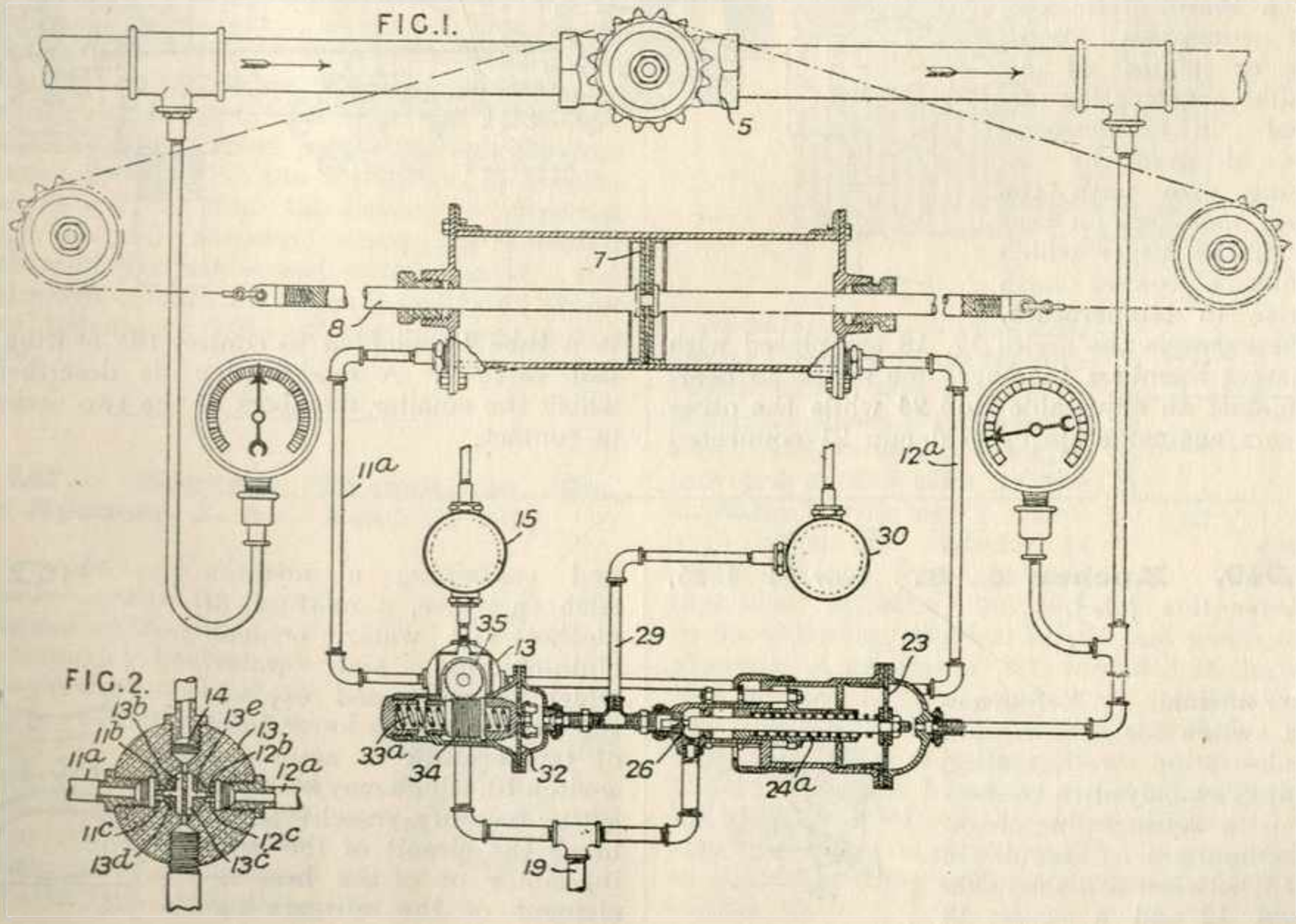


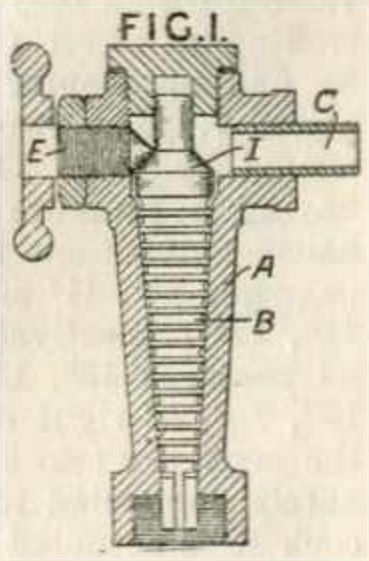
FIG. 2.

tank while the conduit 29 reaches to a higher level. When used as a device for controlling temperature the diaphragm 23 is replaced by a thermostat and the main valve is arranged in a hot water, steam or gas supply pipe.

260,163. Lock, T. J., and **Sprenger, G. C.** April 1, 1926.

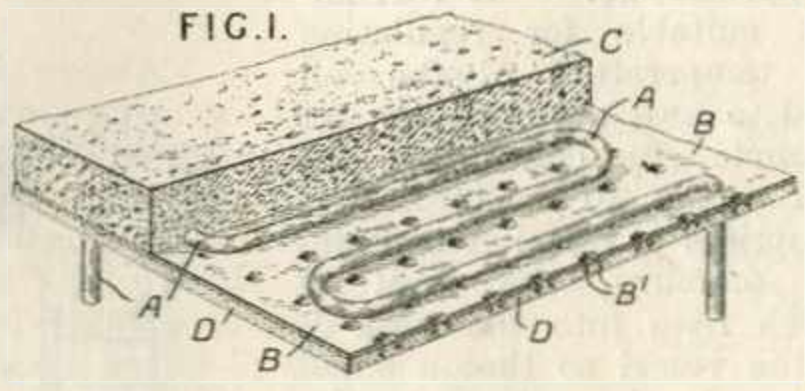
Steam traps.—In a steam trap of the type having a conical plug with labyrinth grooves, the casing A is provided with a side outlet C, and the plug B has a conical shoulder I. An adjusting screw E with a conical point determines the extent of lifting of the plug B under the action of the steam which is admitted at the lower end. In a modification, the outlet C is coaxial with the plug.

FIG. 1.



260,414. Phillips, F. J. Oct. 17, 1925.

FIG. 1.

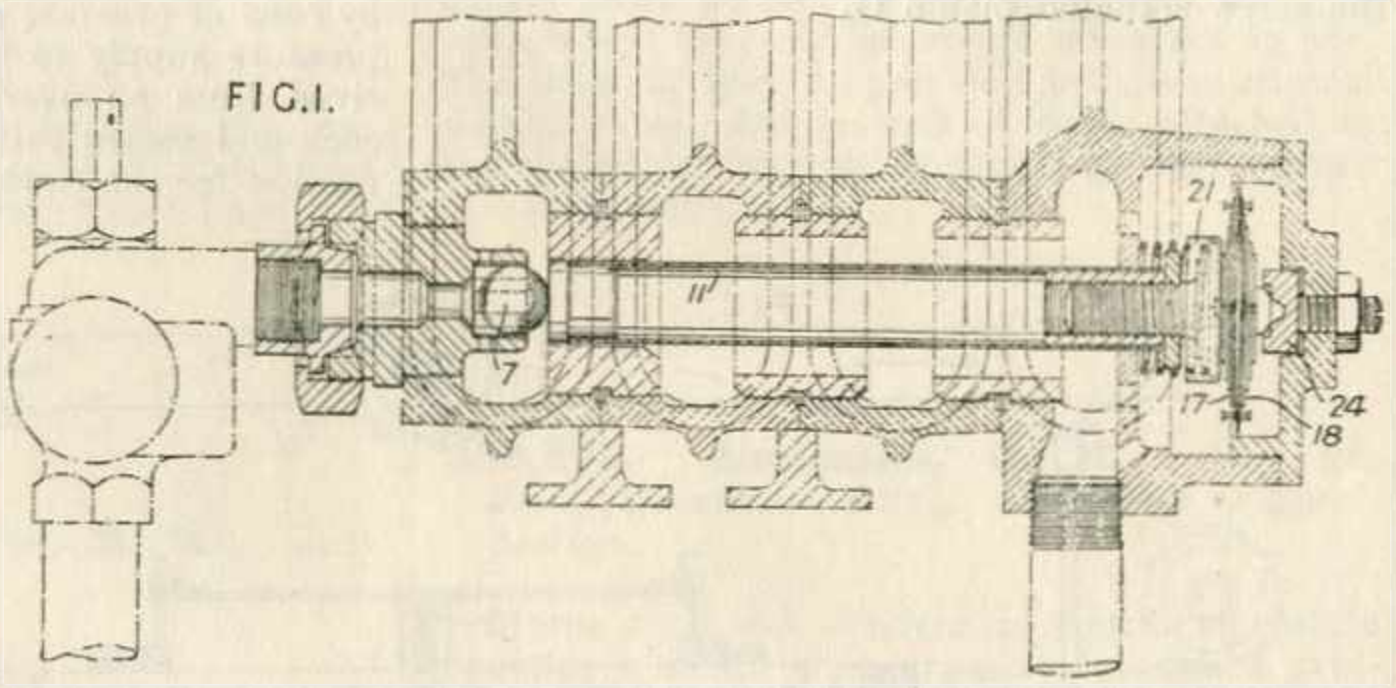


Radiators.—Buildings are heated by means of pipes A, embedded in the wall, floor or ceiling, and secured to the surface of a perforated metal sheet B. The pipes are embedded in the concrete C of the floor or ceiling, and the plaster D is applied only on the opposite side of the plate B, to which it is keyed by projections B^1. In a modification, the pipes are of flattened cross section and are secured to the upper surface of metal lathing or expanded meal. The plaster is applied to the under surface of the metal. The position of the pipes above the metal support prevents cracking of the plaster.

260,764. Laycock Engineering Co., Ltd., and **Pugh, J. W.** Oct. 28, 1925.

Thermostats. — In a steam-admission control device for radiators in which the temperature of the exhausting steam controls a valve at the inlet end, a thermostatic element comprises strips, discs or plates of bimetallic construction arranged in concentric series of gradually increasing size with the smaller members on that side of the larger which assumes a convex form on rise in temperature. In the example the series 17, 18 are placed with the larger members together, one series 18 bearing against an adjustable stop 24 while the other 17 bears against a spring-held cup 21 connected to a tube 11 adapted to control the seating of a ball valve 7. A modification is described in which the smaller members of the two series are in contact.

FIG. 1.



260,949. Kucher, A. A. Nov. 4, 1925, [*Convention date*].

Thermostats. — A thermostatic switch for compression or absorption refrigerating machines employed in connection with refrigerating-chambers comprises a capsule 15 formed between a dished diaphragm 12 and a casing 13 and containing a medium such as water, a mixture of alcohol and water, or calcium-chloride and water, which congeals and expands the capsule at the lower limit of temperature to actuate a switch 16, which may be of the tilting mercury vessel type, to break the circuit of the driving-motor or of the heating-element of the refrigerating-

FIG. 1.

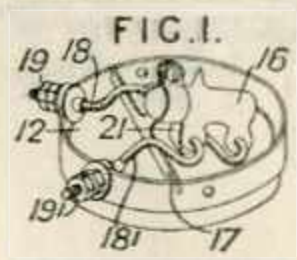


FIG. 2.

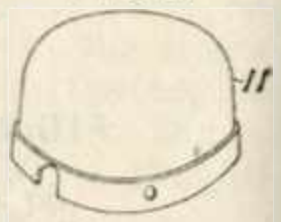
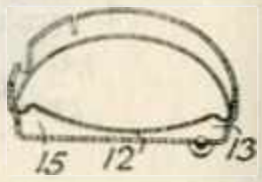


FIG. 3.



machine, the diaphragm flexing back of itself when the liquid melts at the upper limit of temperature. The switch may be mounted to rock about a bridge piece 17, and the diaphragm is provided with a projection 21 to engage the switch. The latter is accommodated within a cover member 11, Fig. 2, the leads 18, 18¹ being connected to terminals 19, 19¹ held between the cover and base. The thermostatic device may be placed on or otherwise in thermal contact with the wall of an evaporator within the refrigerating-chamber, or its distance therefrom may be adjustable to vary the time required to freeze or melt the medium in the capsule and thus the operating and idle periods of the refrigerating-machine which it controls. Specification 210,452 is referred to.

261,116. Foster, C. E. Aug. 19, 1925.

FIG.2.

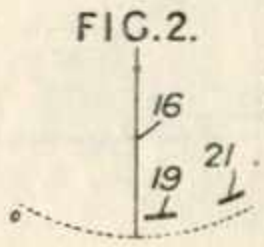
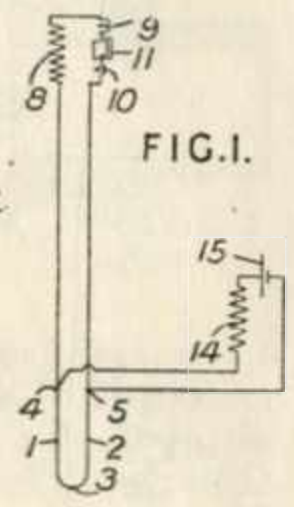


FIG.1.

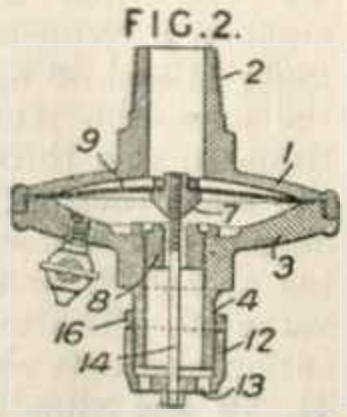


Thermostats. — An electrical regulating or indicating device employing a thermocouple is provided with means for operating an alarm and/or control automatically on failure of the thermocouple. The thermocouple 1, 2 has its hot junction at 3 and its cold junctions at 4, 5, and is connected to a millivoltmeter comprising an adjusting resistance 8, control springs 9, 10, and moving coil 11. The junction 3 is subjected to heat from an electric furnace, and the temperature is indicated by a pointer such as 16. The pointer is periodically depressed by a presser bar carrying a contact 19 so as to complete a circuit at a predetermined temperature and actuate an alarm and/or automatic control. To provide for breakage or failure of the thermocouple, an additional circuit comprising a battery 15 and resistance 14 is connected at 4, 5. The resistance 14 is relatively high compared with all other resistances, and the current from the battery only affects slightly the zero setting of the voltmeter, and most of this current passes through the low resistance 1, 3, 2. If the thermocouple breaks, the whole current from the battery is diverted through the millivoltmeter, causing an increased deflection of the pointer and completion of a circuit through contact 21, which actuates an alarm and/or reduces or cuts off the current to the furnace.

261,247. Spencer Thermostat Co., and **Spencer, J. A.** March 25, 1926.

Thermostats.—A thermostatically controlled valve for regulating the passage of fluid through a heating system is provided with a heat-sensitive element constructed to change shape abruptly and a movable stop to adjust the temperature of operation. The device comprises a casing in two parts 1, 3 screwed together to secure a bimetallic disc 9, and provided with a threaded part 2 for attachment to the heating system. The opposite end 4 is provided with a cap 12 having holes 13 for the escape of fluid, and is secured to a rod 14, which carries a valve 7 attached to the disc 9. The disc is slightly cupped, so that it snaps abruptly at a predetermined temperature to open or close the valve. The opening of the valve is regulated by rotating the cap 12 and stem 14, and the cap may be locked by a nut 16. The temperature at which the disc snaps may be varied by adjusting the position of the seating 8 relatively to the valve, and by rotating the cap 12.

FIG.2.



261,271. Nuss, M. May 3, 1926.

FIG.1.

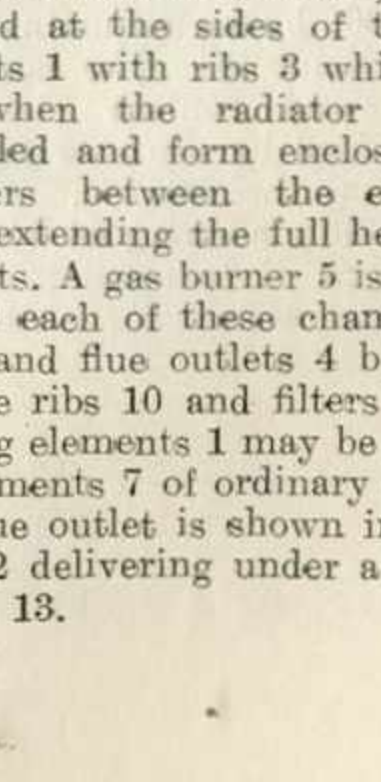
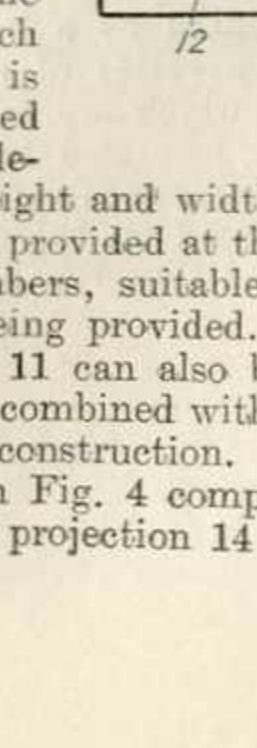
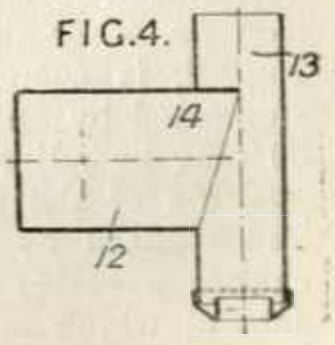


FIG.2.



Radiators. — A radiator, having separate elements connected at top and bottom by the usual bosses 2 for circulation of the contained water, is provided at the sides of the elements 1 with ribs 3 which abut when the radiator is assembled and form enclosed chambers between the elements extending the full height and width of the elements. A gas burner 5 is provided at the lower part of each of these chambers, suitable air inlets 9 and flue outlets 4 being provided. Intermediate ribs 10 and filters 11 can also be used. Heating elements 1 may be combined with radiating elements 7 of ordinary construction. A suitable flue outlet is shown in Fig. 4 comprising a tube 12 delivering under a projection 14 into an uptake 13.

FIG.4.



261,332. Spencer Thermostat Co., (Assignees of *Spencer, J. A.*). Nov. 13, 1925, [*Convention date*].

Thermostats. — A thermostat of the type described in Specification 178,103, in which the heat-sensitive element changes shape abruptly is provided with an adjustable stop to determine the temperature at which the element changes shape, the stop being elastic so that it exerts a force upon the element during its movement. In the application to the fuel control valve of a water heater, Fig. 3, the pipes 2, 3 are connected to the hot water tank and service pipes respectively, and an inner casing 5 containing a bimetallic cupped disc 6 of the kind described in Specification 178,103, is arranged in the casing 1. The disc is adapted to snap abruptly with its curvature in the opposite direction at a predetermined temperature. The inner casing 5 has a tubular extension 10 threaded to receive a locking nut 12 and cap 13, and also to receive an adjustable screw 14 which regulates the tension of spring 15. A pin 17 is secured to the disc 6 and projects through the casing into engagement with the collar 25 on the spindle 17^1 of the fuel-controlling valve 20. The valve is pressed towards its closed position by a spring 24. The temperature limits between which the disc 6 snaps over from one extreme to the other are controlled by adjusting the screw 14, and the spindle 17^1 which carries the collar 25. The thermostat may thus be adjusted so that the range of temperature over which the thermostat is neutral may be made large or small. In the application to the control of the current to a sad iron or other device, the thermostatic disc 30, Fig. 8, is secured at the centre to a stud 31 supported by an insulating member 32. The stem 33 may be adjusted in the sleeve 34 to vary the position of the disc 30, by an adjusting lug 35, and secured by a lock-nut 36. The member 32 carries a series of spaced contact plates (not shown) which are bridged by contacts 42 carried by, but insulated from, the disc 30. The temperature range is varied by a spring 44 which may be adjusted on the stud 31 to regulate the tension, and thus the point at which the disc snaps over.

FIG. 3.

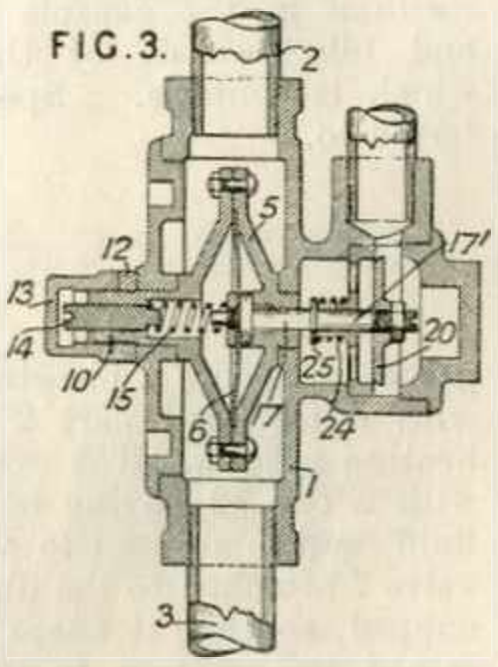
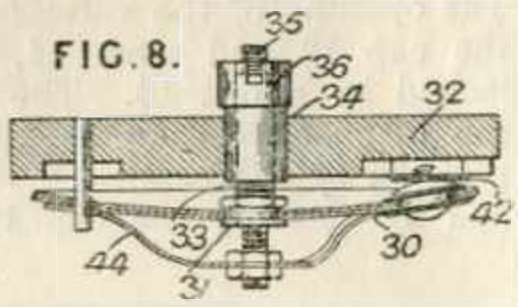
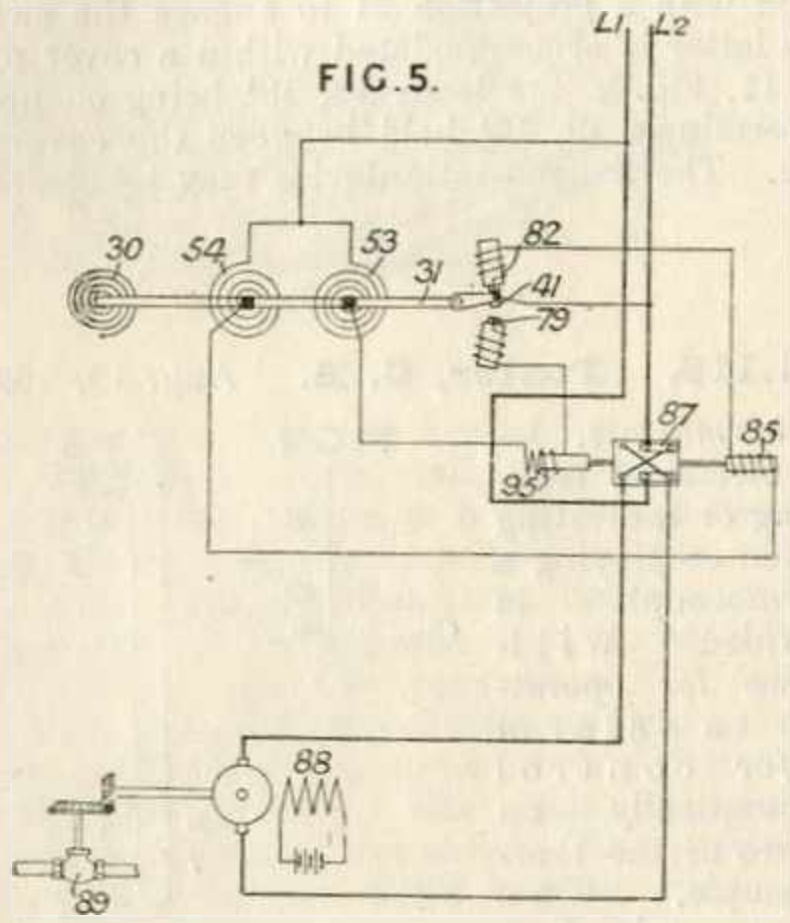


FIG. 8.



261,407. Metropolitan-Vickers Electrical Co., Ltd., (Assignees of *Gano, H. S.*). Nov. 14, 1925, [*Convention date*].

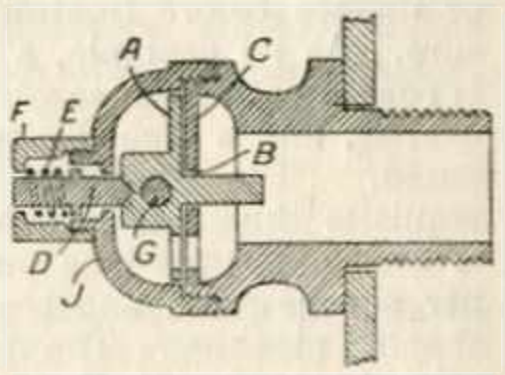
FIG. 5.



Thermostats.—A device for regulating the temperature of water &c. comprises a main bimetallic element or coil 30 which when cooled or heated by the water rotates a shaft 31 and causes a contact 41 to engage either a contact 82 on a contact 79, thereby closing a circuit to an electromagnet 85 or 95 and moving a reversing switch 87 into one or other of its end positions in which a circuit is closed to a motor 88 which then rotates a shaft so as to open or close a valve 89 allowing or preventing the entrance of steam into the water. The coils 85, 95 of the reversing switch are in series respectively with two auxiliary bimetallic elements or pairs of elements 54, 53 which, when heated tend to rotate the shaft 31, but in opposite directions. Assuming that the water is below the required temperature and that the parts are in the position shown, a circuit is completed from the lead L1 through the bimetallic coil 54, electromagnet 85, contacts 82, 41 to lead L2. The reversing switch 87 is actuated and the valve 89 is opened by the motor 88 allowing steam to enter and heat the water. The coil 54 is heated by the current passing through it, and, causes the contact 41 to move from the contact 82, thus breaking the circuit through the thermal coil 54 and the electromagnet 85 and stopping the motor. The coil 54 now cools down and will again cause the contact 41 to engage the contact 82 and the valve 89 to be opened still wider by the motor 88 unless by this time the main thermal coil 30 has reached a temperature sufficient to hold the contacts 41 and 82 apart. Assuming the latter to be the case, the temperature of the water will continue to rise through the steam entering it until the main thermal coil 30 causes the contact 41 to engage the contact, thereby actuating the reversing switch 87 and causing the motor to close the valve 89. The auxiliary coil 53 now comes into action and acts similarly to separate the contacts 41, 79 and stop the motor before the main coil 30, acting alone, would have done so. The con-

tacts 79 and 82 are constituted by the cores of electromagnets in series with the coils 95, 85 respectively to give a quick action to the contact 41. The end of the coil 30 not connected to the shaft is adapted to be adjustably rotated for temperature setting.

261,454. Cornish, T. A., and **Cornish, C. E.** Aug. 6, 1925.



Steam traps.—In a steam trap comprising a ported disc valve A co-operating with a ported seat C and rotated by a lever G actuated by hand or by a float, the valve is housed in a chamber formed by an end cap J removably arranged on the outlet side of the valve. The disc A is formed on a spindle guided at one end in a hole B in the seat C and working at its other end on a pin D, the disc being pressed against its seat by a spring E acting on the pin D and arranged in a cup F adjustably secured to the cup J. The trap is applicable to steam cooking apparatus or the like in which grease is mixed with the steam, whereby the grease is retained in the trap.

261,654. Owen, B. J. April 23, 1926.

FIG. 4.

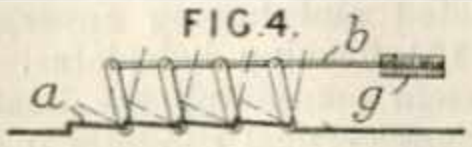


FIG. 3.

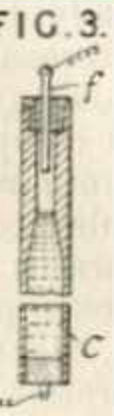


FIG. 1.

Thermostats; air, controlling temperature of.—The temperature of hot air, employed for example in drying crops, is regulated by automatically admitting cold air. The outlet duct A of the air heater is provided with a tube *c* containing mercury and having an adjustable insulated contact pin *f* at the upper end. Contact is made at a predetermined temperature, and a circuit is completed through a battery *h* and solenoid *g*, which actuates a rod *b* to open the louvres *a* and admit cold air.

261,777. Popescu, T., Pais, A., and **Pais, C.** Nov. 19, 1925, [*Convention date*]. *Addition to* 258,413.

Heat-storing apparatus. — Comprises constructions of cooking stoves employing the heating devices forming the subject of the parent Specification, and relates, inter alia, to the provision of electrical, steam, and other heating means alone or in combination. The stove shown in Fig. 1 comprises a heat-conducting and retaining block *x* forming a hot-plate and provided with a closed system of channels containing a heat-transmitting agent which is in the form of a saturated vapour at the operating temperatures. The block is mounted in a heat-insulated structure containing a solid-fuel grate 113, a removable gas burner 111, and an electric heater 125, the latter being in a chamber separated from the combustion space by an insulating wall 126. The gas burner may also be permanently or removably mounted in a separate compartment below the block *x*. The block may thus be heated by any one source or by a number simultaneously. Sliding heat-insulating plates 130 cover the portions of the hot-plate not in use, and an oven 106 is provided. Fig. 3 shows a modified construction occupying less space in which the plate *x* extends

FIG. 1.

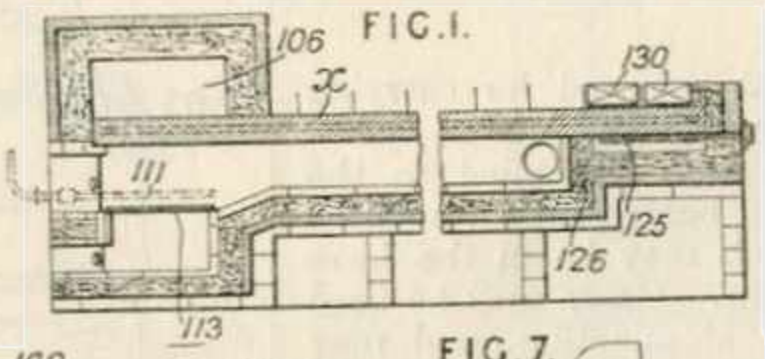


FIG. 3.

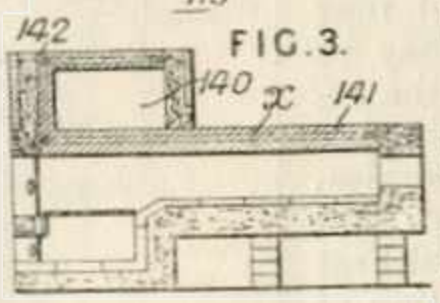


FIG. 7.

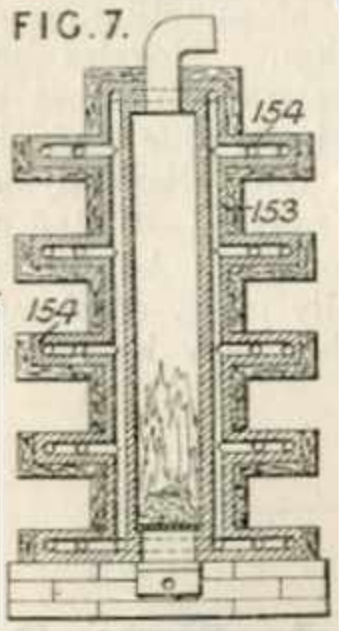


FIG. 9.

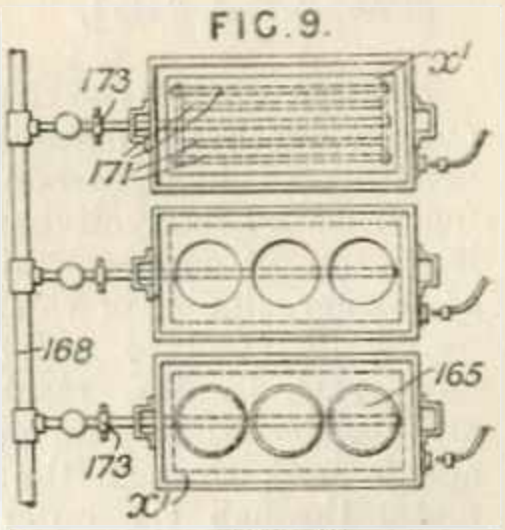
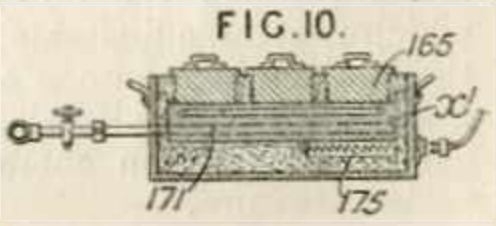


FIG. 10.



up one side and over the top of the oven 140, providing two hot-plate surfaces 141 and 142. Modifications are also illustrated in which the stove is of an angular or part annular form in plan to allow it to be set in a corner and also to enable all parts of the hot-plate to be easily

reached by the operator. The form shown in Fig. 7 comprises a hollow vertical block 153 internally heated and having superposed annular extensions 154 forming hot-plates. The closed channel system containing the heat-transmitting fluid comprises vertical conduits in the block 153 communicating by means of radial channels with annular conduits in the extensions 154. The apparatus may be heated by an outside source, for example by the waste gases of a furnace. Figs. 9 and 10 show an apparatus comprising separate heating blocks x^1 which are heated from a common source and then taken to various points of use, and applicable for military, factory, and like purposes. The blocks are contained in heat-insulating casings the tops of which are formed with utensil openings with insulating covers 165. They may be heated by means of electrical heaters 175 connected by plugs to a common supply, or by means of steam supplied from a pipe 168 to which they are temporarily connected by unions 173, the steam passing into one or more channels 171 in the blocks. Another stove is described designed to heat utensils all of the same size and shape, and having openings to accommodate them formed in a heat insulating cover over the hot-plate. A further construction comprises a number of heating blocks arranged in series and heat insulated from one another, the blocks having channels for heating them by steam, which passes through the blocks in series. Valves between the blocks allow the steam to be cut off from any number not required.

261,786. Trautmann, J. Nov. 21, 1925, [*Convention date*].

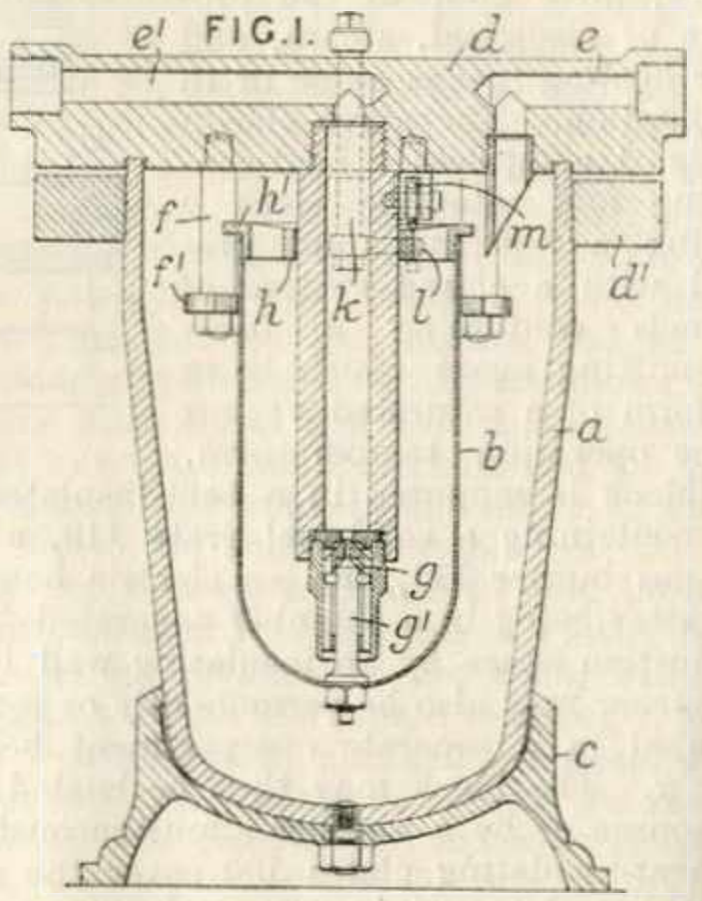
Heating systems.—Heat required for carrying out the synthesis, distillation, cracking, or hydrogenation of hydrocarbon oils is applied to the materials by finely-divided heated metal, such as lead, tin, or copper, which may be in the form of powder, liquid, or vapour. Gases may be used as carriers and to assist atomization, and may take part in the reaction. Nozzles may be arranged coaxially and preferably so that the reagents pass through the inner one and the hot metal through the outer one. Several nozzles, which may be adjustable, may be situated so that the jets impinge on one another. Additional heat may be supplied electrically or by combustion of gas. The reaction chamber may be maintained under pressure.

261,818. Samuels, J., Slade, P., and **Ward, J. F.** July 28, 1925.

Non-conducting coverings for heat.—Materials which may be used as non-conductors of heat are made of waste pieces of buckram and allied fabrics, such as stiffened net and oparterie, obtained especially in hat making; these are dipped into a liquid containing a filling-material, with or without a binding agent, and the pieces are built up into a layer or block, and subjected to heat and pressure. The stiffening normally present in buckram may serve as binding-agent, or additional binders, such as glue may be used. Sawdust, silver sand, powdered glass, kieselguhr, or china clay may be used as fillers, and may be sprinkled or spread upon the buckram. Silk, paper, felt, or similar surfacing materials may be applied to one or more surfaces of the layers or masses before treatment with heat and pressure. As an example, a waste piece of buckram is coated with glue, sawdust and sand is sprinkled over it, and a second piece of buckram is superposed. The procedure is repeated until the requisite thickness is obtained, and the material is then subjected to a pressure of 80 to 100 lbs. per square inch, and the temperature of a hat-shaping machine. The material may be moulded prior to or during the pressure and heat treatment. In another example, small cuttings, dipped in glue, are spread upon a piece of damp buckram, and spread with sawdust, and a further layer of cuttings is added. This is continued as necessary. A piece of buckram is placed over the whole, which is treated by heat or pressure. In another example, a fine cotton fabric is covered with waste buckram pieces which have been dipped into a bath of glue and china clay, and treated with heat and pressure as before. Specification 776/76, [*Class* 42, Fabrics, Dressing &c.], is referred to. According to the Provisional Specification, fabrics other than buckram, such as canvas, may be utilized, and other binding-agents, such as tarry matters, resins, cements, and plaster of Paris.

261,909. Dewrance, Sir J. Nov. 19, 1925.

FIG. 1.

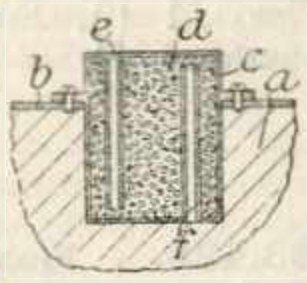


Steam traps.—A steam trap of the kind described in Specification 27258/11 has the casing

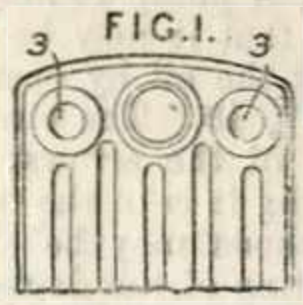
built up of a malleable steel stamping *a* mounted on a base plate *c*, and closed by a cover *d*, embodying the inlet and outlet passages *e*, e^1, which is bolted to a flange d^1 screwed, welded, or flanged over the stamping *a*. The cover *d* carries studs *f*, supporting a ring f^1 which guides the float *b*. The latter is provided with a guide ring *h*, h^1 which limits the fall of the float. A hand-operated spindle *k* carries a radial arm *l* which actuates a bell-crank lever *m* projecting over the float and adapted to depress it to test the working of the trap. The main and pilot valves *g*, g^1 are as described in Specification 27258/11. The internal parts are all removable with the cover *d*.

262,103. Schmidt, E., and **Dyckerhoff, E.** Nov. 30, 1925, [*Convention date*].

Nonconducting coverings for heat.—In order to prevent the entrance of moisture into heat insulating devices, a cartridge *c* containing a hygroscopic substance *d* is mounted on the casing *b*. Any air which passes into the heat-insulating material *a*, which may be a packing material or air, is thus deprived of moisture, and condensation in the insulating device is prevented. Tubes *e*, *f* may project into the material *a*. The device is applicable to liquid air plant in which air is the insulating medium.



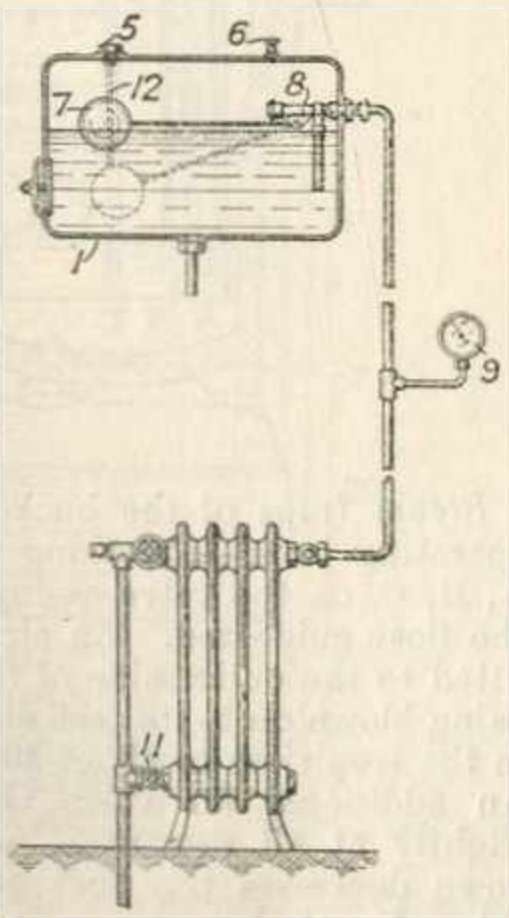
262,452. Fuchs, A. Dec. 3, 1925, [*Convention date*].



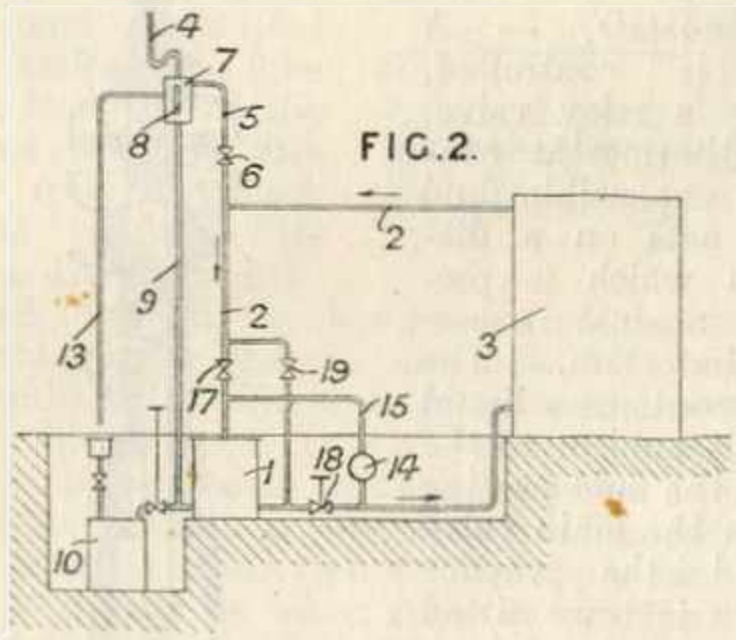
Radiators.—A radiator comprises sheet-metal elements of from 0.6 to 1 mm. in thickness and stamped with depressions 3 adjacent to the connecting apertures at the top and bottom of the elements and intermediate longitudinal channels 1. The plates forming the elements are welded together at their edges and between the longitudinal channels.

262,731. Woude, D. van der, and **Municipal & General Heating Co., Ltd.** Dec. 9, 1925, [*Convention date*]. *Addition to* 234,318.

Heating buildings.—In the heating system described in the parent Specification, the float-controlled tanks which are placed above the radiators are capable of being closed to the atmosphere. The tank 1 is provided with a valve 6 so that air can escape while the system is being filled. When the float valve 8 closes the valve 6 is closed, and the pressure indicated on a gauge 9 at a suitable place. Any variation in this pressure due to a leakage of the float valve or accumulation of air is thus indicated and the defect can be rectified. The whole system may be flushed by opening the valve 11 and depressing the float 7 by a rod 12 attached to the same or a different plug 5.



262,753. Manufacture de Machines Auxiliaires pour l'Electricité et l'Industrie. Dec. 10, 1925, [*Convention date*].



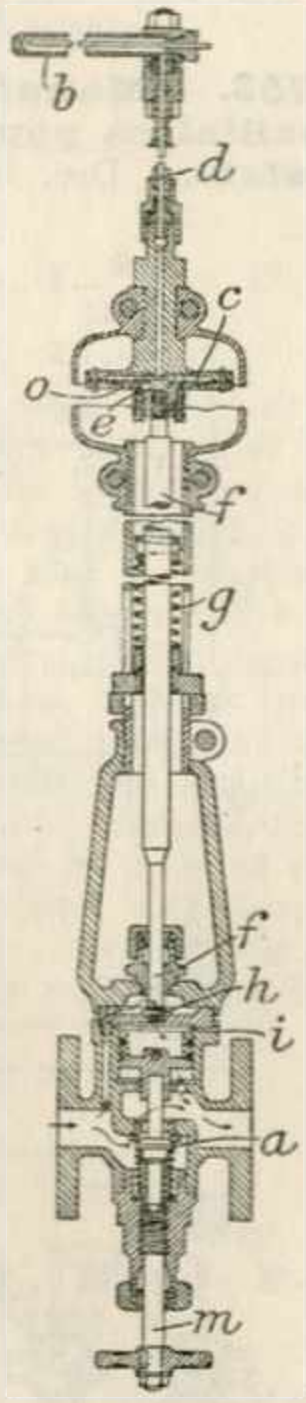
Heating by circulation of fluids.—An apparatus for heating by the circulation of hot oil is

provided with an expansion vessel having a level indicator, and with thermostatic means for controlling the circulation either by thermo-siphon or by a pump. An oil heater 1 is connected by pipes 2 to a device 3 to be heated, and by pipes 5, 4 to the atmosphere. An expansion vessel 7 has a level indicator 8 and is directly connected to the boiler by a pipe 9. The valve 6 is closed during working, and oil is forced by expansion in the system to rise in the pipe 9. Oil is supplied to the system from a tank 10, and any overflow from the vessel 7 returns through pipe 13 to the tank 10. The temperature in the heater 1 may be controlled by a thermostat. A pump 14 may be connected in a by-pass 15 so that it may be employed to assist circulation of the oil by opening valve 19 and closing valves 17, 18. The circulation is then in the direction of the arrows, but when the pump is not operating it is in the opposite direction. The two methods may be alternated to effect a uniform heating of the device 3. A device for automatically changing over on accidental stopping of the pump is shown in Fig. 3. A thermometer with an indicator 21 is placed at the point of highest temperature of the heater 1, and contacts with a conductor 22 to complete an electric circuit which includes electromagnets 23, 24 so that the valves 17, 18 are opened, and the valve 19 closed. In an alternative form, the thermometer may be placed at the bottom of the device 3, so that if, during thermo-siphon circulation the pointer 21 falls below the contact 22, the electromagnets are no longer energized, and the pump is brought into operation.

262,837. Knudsen, H. June 23, 1925.
Drawings to Specification.

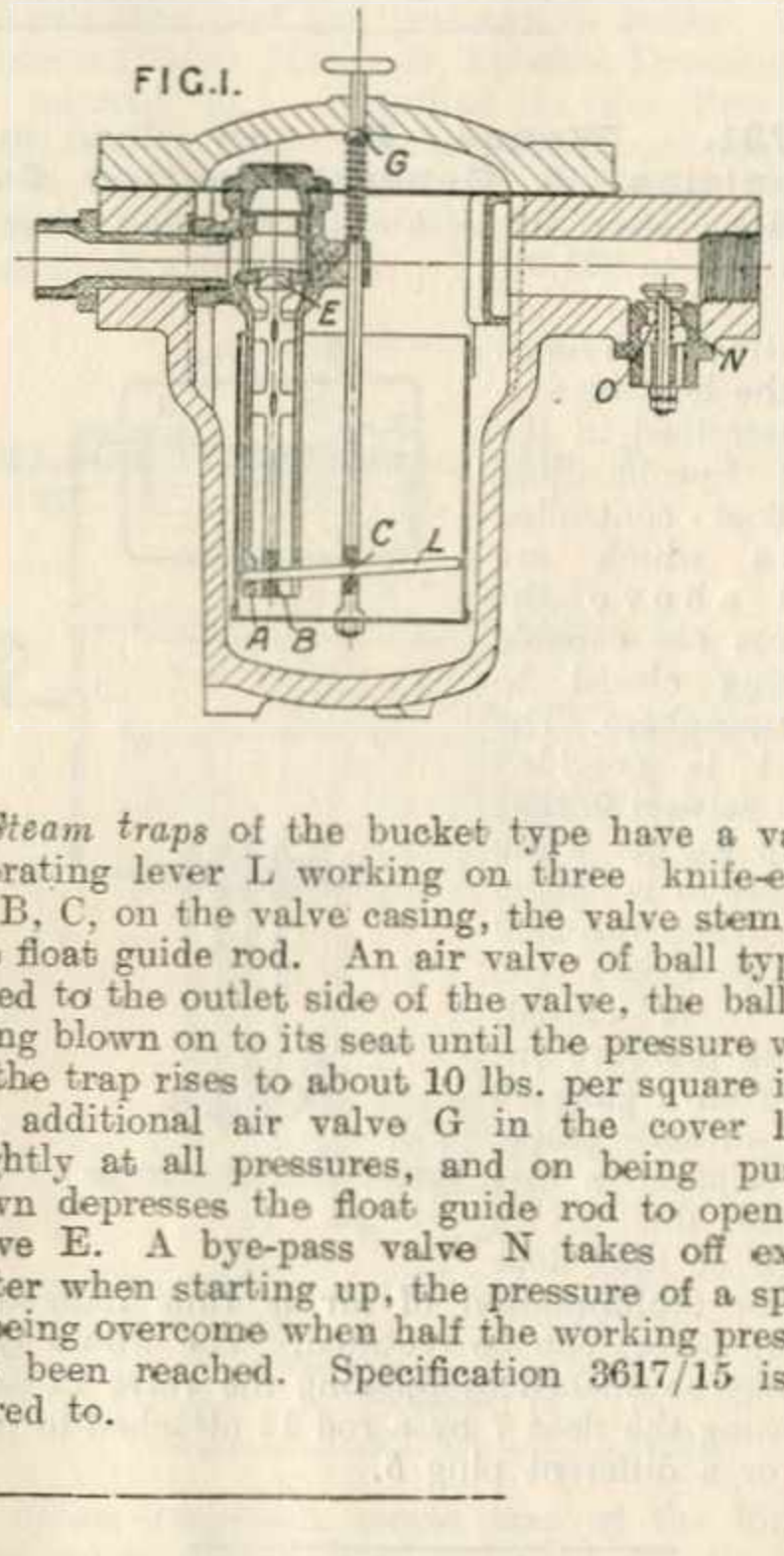
Thermostats.—A thermostat comprising a bi-metal helix in a casing, through the jacket of which steam passes to the engine, is used to control the oil supply to a power generating system of the kind described in Specification 262,836. [*Class* 51 (i), Furnaces and kilns, Combustion apparatus of].

263,058. Dale, W. B., Hopkinson, R. A., and **Hopkinsons, Ltd.** July 31, 1926.



Thermostats. — A valve is controlled, through a relay valve, by a thermostat containing expansible fluid which acts on a diaphragm which is protected against excessive distortion. The tube *b* contains a liquid which is subject to the heat of the fluid passing through the main valve *a*, and the vapour pressure is transmitted through a tube *d* to a diaphragm *c* mounted on a block *e*. A plate *o* prevents excessive distortion of the diaphragm *c*.

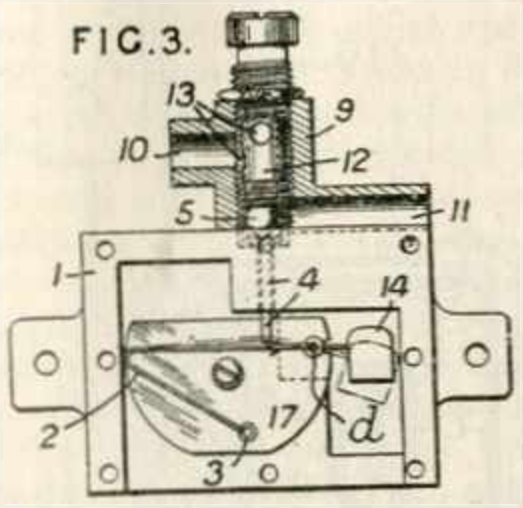
263,435. Lancaster & Tonge, Ltd., and **Butterworth, J.** Aug. 21, 1926.



Steam traps of the bucket type have a valve-operating lever L working on three knife-edges A, B, C, on the valve casing, the valve stem and the float guide rod. An air valve of ball type is fitted to the outlet side of the valve, the ball not being blown on to its seat until the pressure within the trap rises to about 10 lbs. per square inch. An additional air valve G in the cover leaks slightly at all pressures, and on being pushed down depresses the float guide rod to open the valve E. A bye-pass valve N takes off excess water when starting up, the pressure of a spring O being overcome when half the working pressure has been reached. Specification 3617/15 is referred to.

263,600. Matthews, A. Nov. 27, 1925.

FIG. 3.



Thermostats.—A thermostat for regulating the supply of gas to a heating burner comprises a casing 1 e.g. of aluminium, accommodating an expansible **V**-shaped strip 2 of mild steel or other flexible metal, one end being connected to a fixed point 3 and the other supporting a vertical spindle 4 upon which rests a valve closure member 5. The movable end of the strip is connected to a weight 14 by a rod pivoted at a point *d*. A metal plate 17 is narrowly spaced from the strip to concentrate heat. The valve 5 is replaced by a make-and-break device in connection with electrical heating means. Specification 229,381, [*Class* 70, Indiarubber &c.], is referred to.

263,818. Popescu, T., Pais, A., and **Pais, C.** Dec. 23, 1925, [*Convention date*].

FIG. 1.

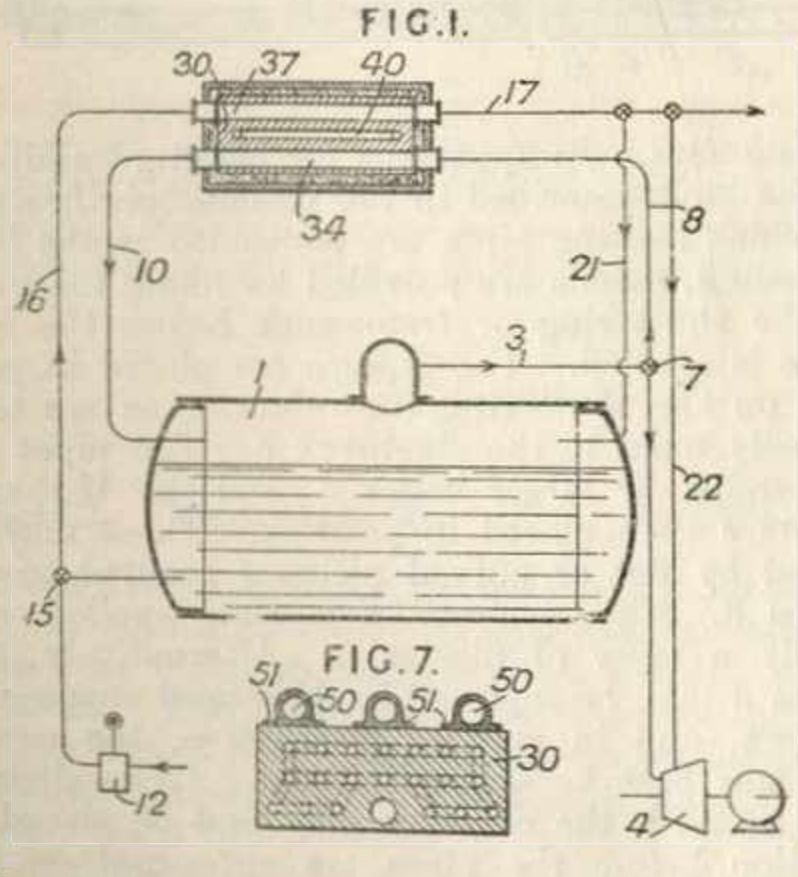


FIG. 7.

Heating systems and apparatus. — Excess of steam produced in a boiler is passed through a solid conducting mass, in which the heat is stored, and from which it may be supplied for heating feed water or otherwise. The temperature in the solid mass is equalized by means of a system of closed passages containing a volatile liquid. Steam passes from a boiler 1 through a pipe 3 and valve 7 to an engine 4, any excess being passed through a pipe 8 to a passage 34 in a heat-insulated metal block 30, which is connected by a pipe 10 to the boiler. Feed water is supplied by a pump 12 through valve 15 and pipe 16 to passages 37 in the block 30, and thence by pipes 17, 21 to the boiler, or, if steam is generated, through a pipe 22 to the engine. A system of closed connected passages 40 contains a volatile liquid such as water, alcohol or ammonia to equalize the temperature of the block. In a modification, Fig. 7, the water-heating passages may be in the form of external pipes 50 having a broad flat surface 51 in contact with one face of the block 30.

263,819. Popescu, T., Pais, A., and **Pais, C.** Dec. 23, 1925, [*Convention date*].

FIG. 1.

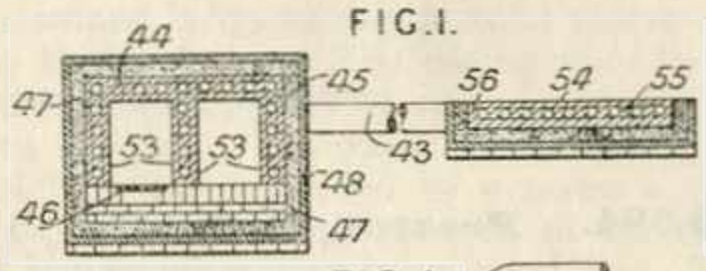
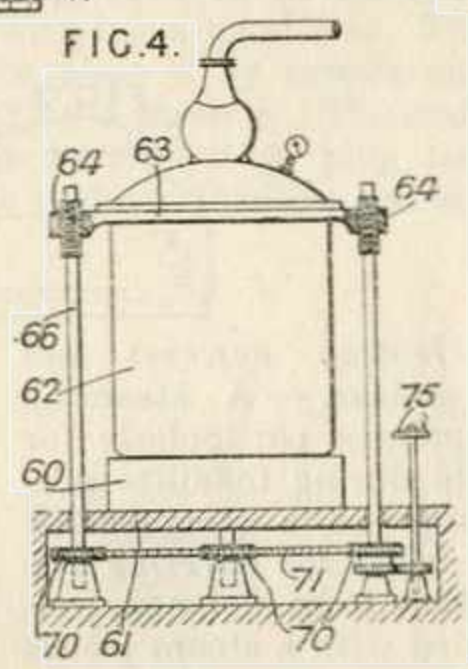


FIG. 4.

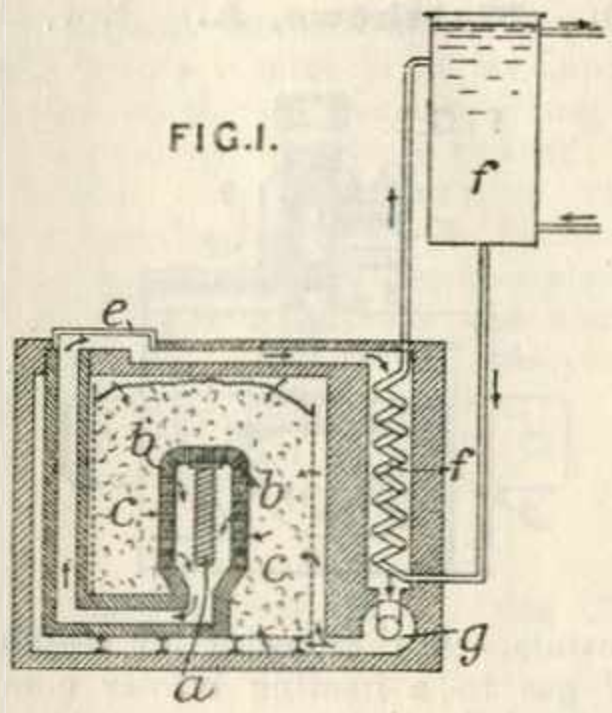


Heating by circulation of fluids; heat-storing apparatus. — Heat is absorbed by a metallic block, transmitted to another block by a volatile fluid in completely closed passages, and transmitted to a still or the like from one side of the second block. The heat receiving block 45 is insulated by layers 47, 48, and is heated internally by hot gases from a fire grate 46 which pass through the flues 53. A heat transmitting substance such as water, ammonia, or alcohol is sealed into a system of passages 44 which are connected through a pipe 43 to a similar system 55 in a heat transmitting block 56. The latter is uncovered on its upper face 54 so that heat may be taken from it. In Fig. 4, the heat-transmitting block 60 rests on a fixed support 61 and a still 62 rests on it. A ring 63 surrounding the still has lugs 64 into which screwed spindles 66 are threaded. The lower ends of the spindles carry sprocket wheel 70 connected by a chain 71 so that they may be rotated simultaneously by a hand-wheel 75 to raise or lower the still, and so vary the heat absorbed. In a modification, the still may be fixed and the block 60 movable.

263,827. Seehaus, P. Dec. 24, 1925, [*Convention date*].

Heat-storing apparatus. In a device for storing and utilizing electrically generated heat, the heat is transmitted to the consuming device by a circulating liquid or gas which passes inwards through a porous insulating covering serving in part for the storage of heat. Heat from an electric heater *a* is stored in part by a relatively small storage mass *b* and in part by an insulating covering *c* of superposed plates, sand, or other porous medium. The heat-transmitting medium is circulated by a pump *g* inwards through the medium *c* and core *b*, and thence in contact with a cooking plate *e* and water heater *f*. The circulation of the medium is regulated by dampers or by the speed of the pump *g*. The insulating covering *c* may be subdivided into superposed coverings having independent means for circulating fluid through them. The inner device may be used for generating steam, and the next for heating feed water. If air is used as the circulating medium, it may be allowed to escape when it has given up heat.

FIG. 1.



263,994. Preston, J. R. Dec. 1, 1925.

FIG. 3.

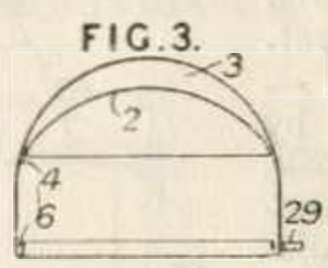
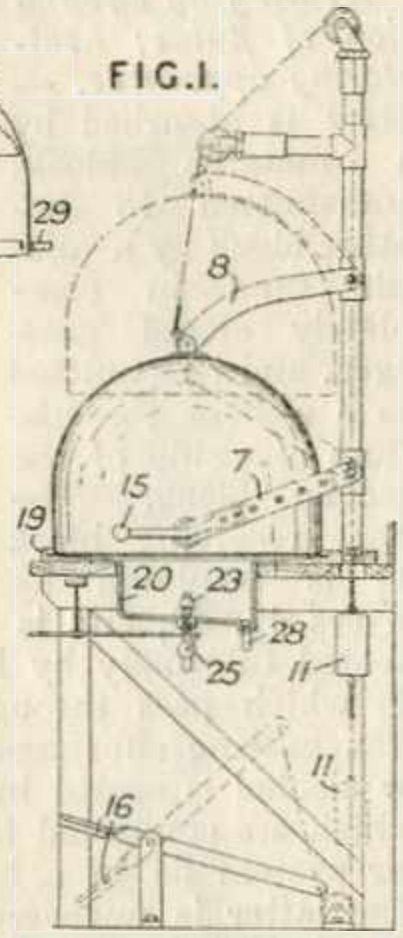


FIG. 1.



Heating systems and apparatus.—A steaming apparatus particularly for hats during manufacture, comprises a steam hood or dome for covering the article to be steamed, provided with a steam jacket at the top and an inner perimetal trough at the bottom, to prevent water of condensation coming into contact with the article. The steam jacket may consist of a chamber 3, Fig. 3, formed by a domed partition 2 supported by brackets 4 spaced to allow entry of steam and exit of water. The trough 6 has a drain pipe 29. The dome is guided by pivoted links 7, 8, Fig. 1, counterbalanced by a weight 11 and raised and lowered by a handle 15 or a treadle 16, for the insertion and removal of work. Normally the dome stands in a tray 19, the bottom of which has a recess 20 provided with a steam nozzle 23 and drain pipe 28. The steam cock 25 may be linked to the dome so that when this rises, steam is automatically shut off.

264,004. Benham & Sons, Ltd., and **Allensby, C. R.** Dec. 15, 1925. *Addition to* 243,630.

FIG. 3.

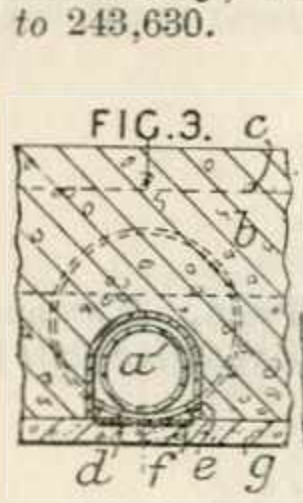
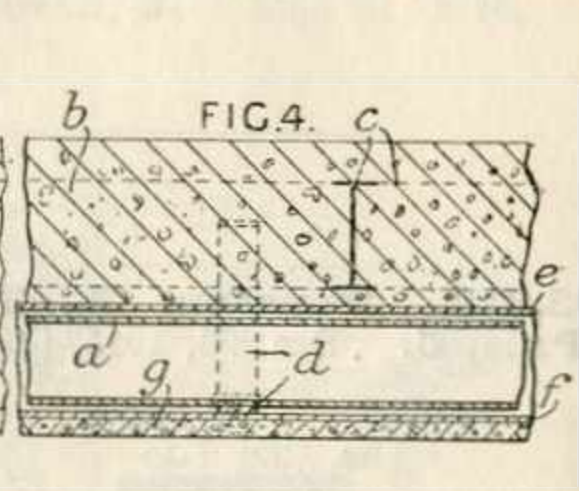


FIG. 4.



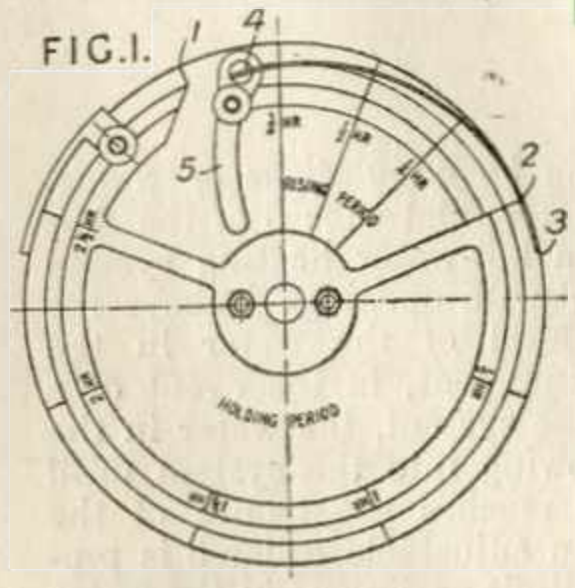
Radiators.—In apparatus for heating buildings, of the kind described in the parent Specification, in which heating pipes are embedded in the floor or ceiling, means are provided for fixing the pipes to the shuttering or framework before the concrete is applied. The pipes *a* are placed in position on the shuttering (not shown), or are temporarily fixed to the steelwork *c*. The pipes are suspended by larger hoops *d*, and the U-shaped covers *e* then placed in position. These may be closed by flat or curved pieces *f* secured to the hoops *d*. The concrete *b* is then applied, and finally a layer of plaster *g*. Alternatively, the hoops *d* may be replaced by U-shaped suspension devices, and in another alternative, the covers *e*, *f* may both be semicylindrical. In an alternative method, the covers *e* may first be placed in position before the pipes are supported on the shuttering or fixed to the framework.

264,214. Wingfield, B. R. Oct. 12, 1925.

Thermostats.—An adjustable cam for use in connection with automatic temperature and pres-

sure regulators comprises a circular disc, Fig. 1, a portion 1, 2 of the circumference of which is cut away and provided with a flat spring fixed to the disc circumference at one end 2, 3 and at the other end carried by a clamp 4 adjustable in a slot 5 or alternatively by a radial slotted arm adjustable on a central screw stud. The cam is graduated angularly for time intervals and radially for temperature or pressure differences and may be used in a regulator of the type comprising a floating lever operatively attached at one end to a member sensitive to temperature or pressure changes whilst the other end rides upon the cam which is rotated by clockwork, the central portion of the lever being operatively connected to a relay valve.

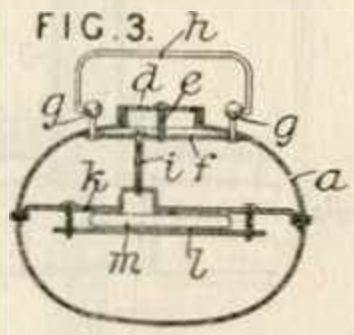
FIG. 1.



264,713. Höck, H, and **Höck, G.** May 12, 1926. *No Patent granted (Sealing fee not paid).*

Footwarmers.—In warming-pans of the kind in which an electric heating element *m* is enclosed in a casing *a* together with sand or other heat-absorbing, electric insulating material maintaining the pan warm for a considerable time after the current is switched off, the element *m* is insulated from the sand and is held in position by being clamped between two parallel plates *k*, *l* secured to the casing *a*. The casing may be in two halves secured together by screws to facilitate dismantling the pan. The upper half has an aperture closed by a lid *d* secured by a screw *e* to a plate *f*, the plate *f* having secured at its ends bolts with ball-heads *g* carrying a handle *h*. The plate *l* is secured to the plate *k* by screws and the plate *k* to the plate *f* by a screw *i*. The ends of the heating wire are connected to plug terminals in a cavity in the upper half of the casing.

FIG. 3.



264,837. Hewittic Soc. Anon., (Assignees of *Becq, A.*). Jan. 19, 1926, [*Convention date*]. *Addition to* 249,121.

Thermostats. — In mercury-vapour apparatus, the starting electrode *a* is supported by a thin bimetallic strip *b*, Figs. 3 and 5, and a thick bimetallic strip *e*, the strips when cool contacting the electrode *a* with the cathode *i* as in Fig. 3.

FIG. 3.

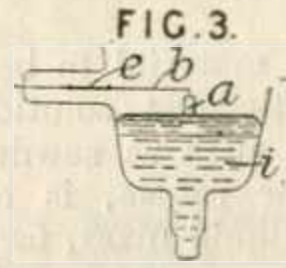
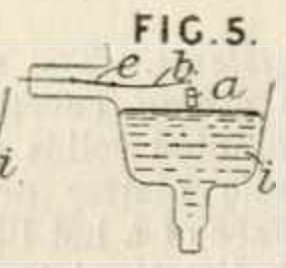


FIG. 5.



264,962. Courtot, L. Nov. 18, 1925.

Radiators.—A radiator for heating buildings is provided with horizontal cast iron headers having bosses over which the ends of vertical steel tubes are forced. The upper and lower headers 2 have coupling bosses 3 for connecting the sections together, and bosses 4 over which steel tubes 5 are forced. Each tube consists of two halves united by longitudinal flanges 6, e.g. by electric welding. A slight recess 4^a may be provided into which the end of the tube engages. The ends of the tubes may be strengthenel by rings 8 soldered or welded to the tubes. The flanges 6 may alternatively be secured by turning one flange over the other as in Fig. 5. Specifications 3530/80 and 14297/98 are referred to

FIG. 1.

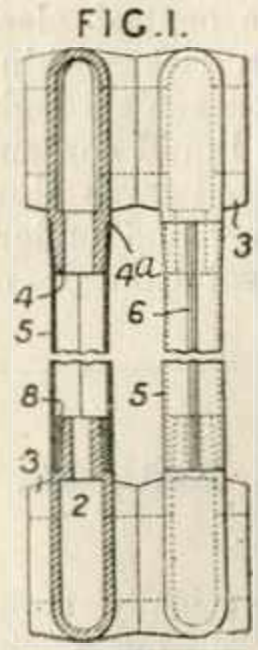


FIG. 3.

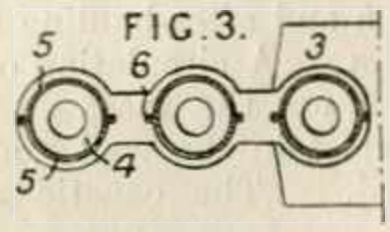


FIG. 5.

265,217. Dürst, T. Jan. 27, 1926, [*Convention date*].

Heating by circulations of fluids.—The water inlet tube 3 of the flow pipe of a hot-water heating system is formed with openings 4 above the normal level of the water in the boiler to prevent, in the event of a leak in the system, the water in the boiler flowing into the system until its level reaches the mouth of the tube. An adjustable collar 5 is provided to limit variations in the water level around the tube. The hot water passes through the flow pipe to the filter chamber 7, in which is arranged a removable grating 8, and thence through the plate-rack 11, saucepan 12, hot-table 13, water-sheet 14 and radiator 15 to the return pipe 16 which communicates with a circulation pump 20 having a shaft of nickel steel. Air valves 19 are provided on the highest parts of the system.

FIG. 1

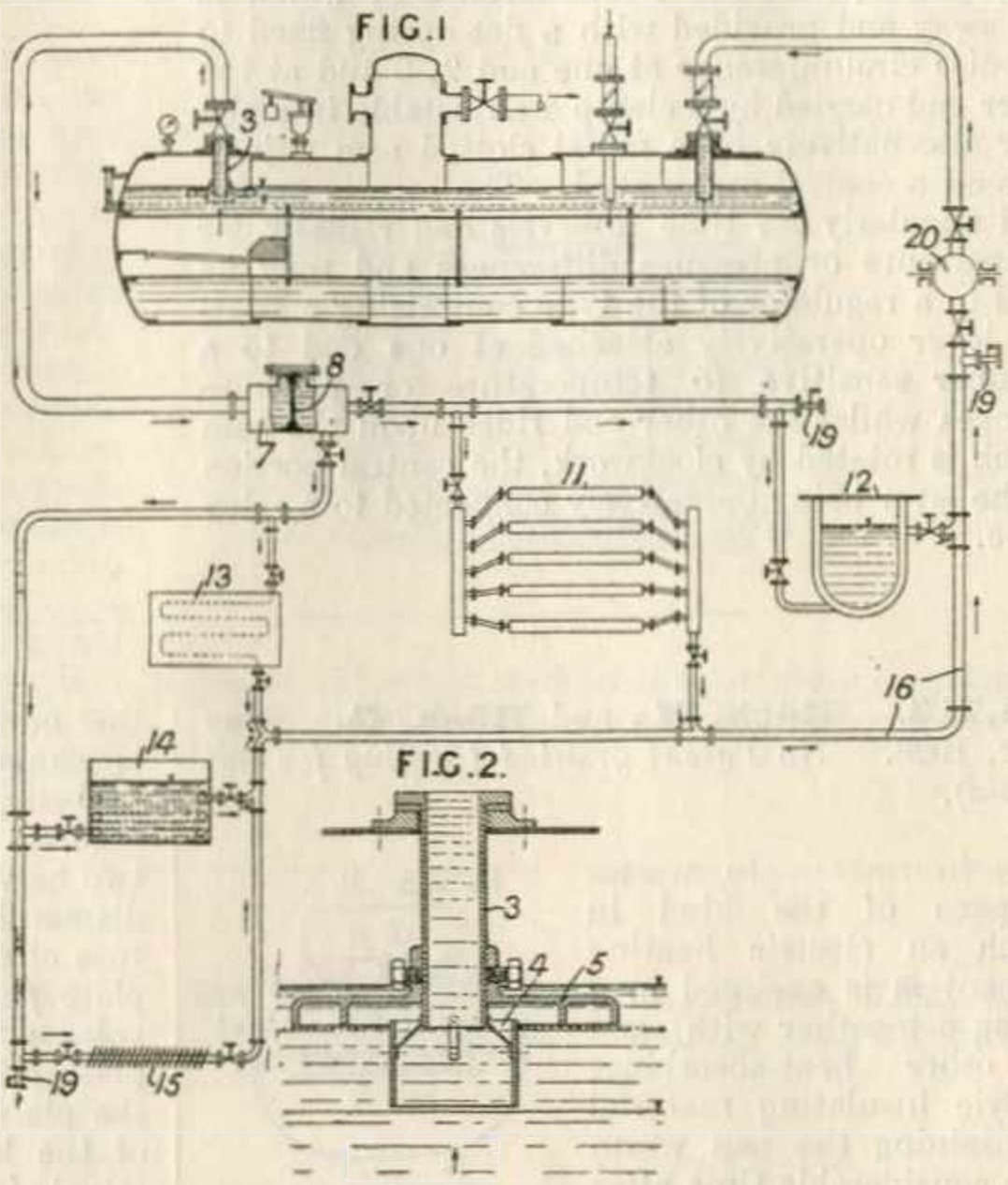
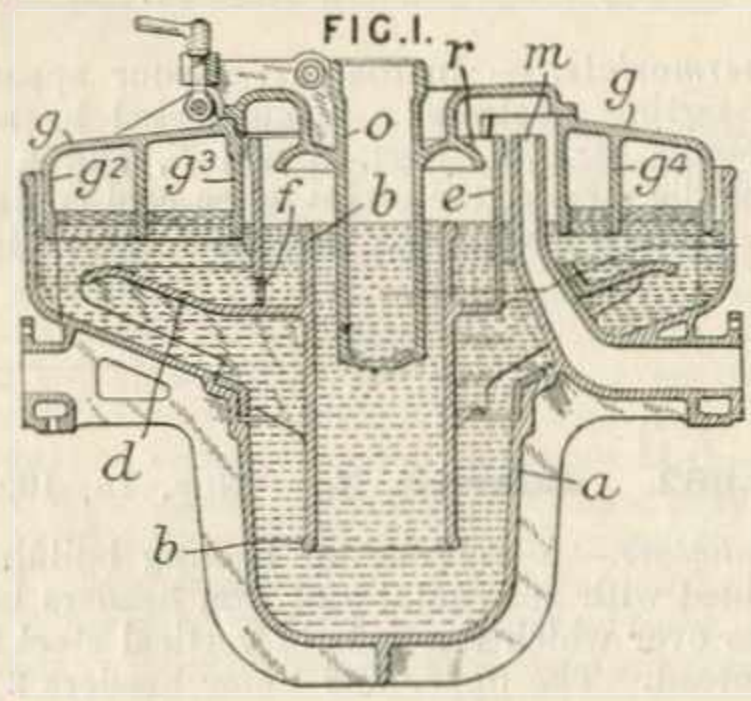


FIG. 2.

265,252. Hammond, C. F., and **Shackleton, W.** Sept. 5, 1925.

Heating systems.—The material to be treated, for example strong caustic-soda solutions, oils, tar or comminuted solids such as sawdust, ores, coal, vegetable matter or refuse, is conducted over the surface of a hot liquid mass, for example lead, heated directly by gases of a submerged-flame burner, the products of combustion being withdrawn at a portion of the surface which is not covered by the material under treatment. In the example of an apparatus shown in the Figure the hot liquid mass is contained in a vessel *a*, which may be heated at starting by an external furnace. During the treatment a submerged-flame burner extends down the central sleeve *o* and the products of cumbstion rise within the screen *b* and after baffling at *r* escape through the outlet *m*. A circulation of the liquid contents is thus set up, the mass passing outwards through the ports *f* in the wall *e* and over and under the baffle *d*. The caustic-soda solution or other material to be treated is caused to flow in a substantially circular path on the surface of the mass between depending walls g^2, g^3, g^4 carried

FIG. 1.



by the cover *g*, suitable inlets and outlets being formed by tubes projecting from beneath the surface of the mass.

265,521. Wiggin & Co., Ltd., H., and **Lobley, A. G.** Oct. 1, 1925.

Thermostats.—Heat is automatically supplied to or cut off from a furnace &c. by a spring-switch which is controlled by a thermostat having high and low expansion elements of nickel-chromium and silica respectively, the elements being held in abutment with each other in the furnace by springs disposed outside the furnace and adapted, upon a predetermined rise of temperature and the consequent extension of the

high-expansion element, to overcome the switch spring and cut off the supply of heat to the furnace. Fig. 1 shows the invention applied to the control of the current to an electric furnace, the high-expansion rod *f* of the thermostat passing through the furnace wall and having an abutment f^2 at its furnace end which is held against the low-expansion tube *i* by springs *d* threaded upon guide-rods c^3 and pressing against a crosshead *c*. The temperature at which the lever is to be tripped is controlled by a nut g^5, which is rotatably mounted in a fixed housing g^6, and which controls the position of the sleeve *g* which is

FIG.1.

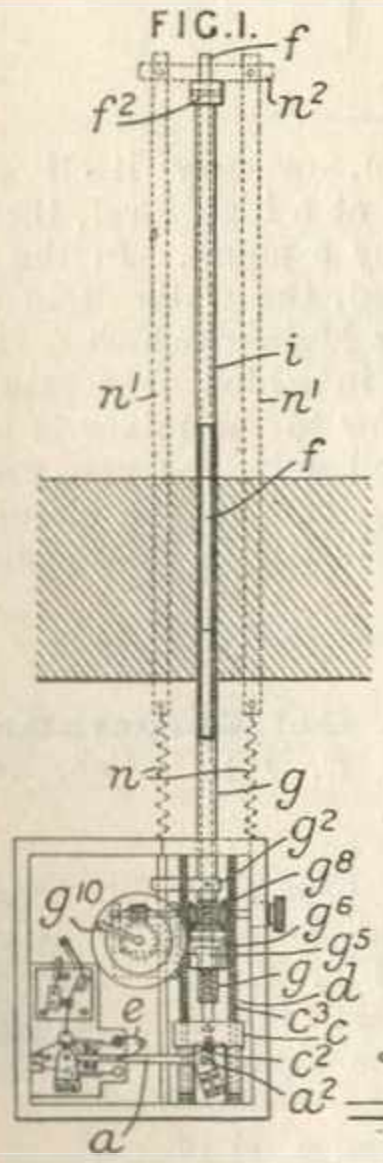
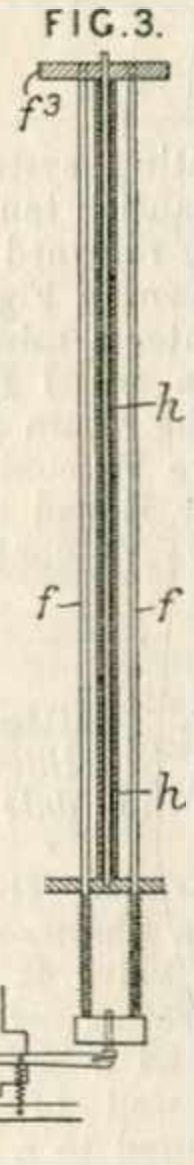


FIG.3.



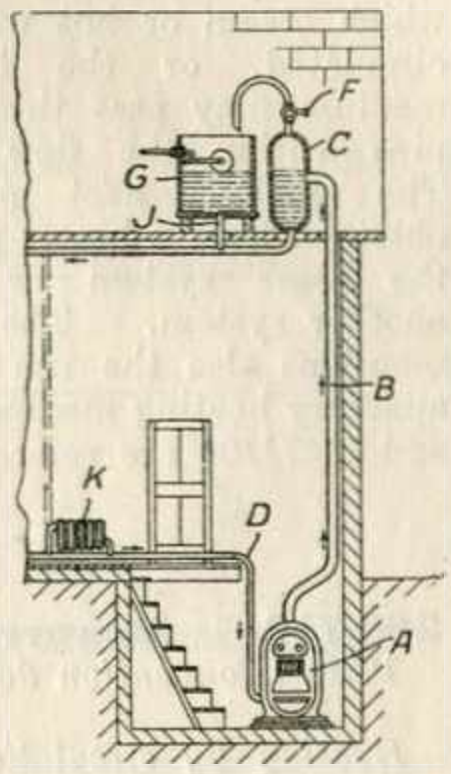
secured to the slidable bracket g^2. In a modification, the high and low expansion elements are held in abutment through a crosshead n^2 and rods n^1 by springs *n*. In another arrangement, the high-expansion elements consists of two parallel rods *f*, Fig. 3, which are secured to a crosshead f^3 which is held in abutment with the low-expansion element *h*. In a further modification, the high-expansion element consists of a tube of nickel-chromium surrounding a silica rod and projecting into the furnace. Specification 261,516 [*Class* 38 (v), Electric switches &c.], is referred to.

265,625. Soc. la Thiolite, (Assignees of *Soc. Levy, Samuel, et Levy*). Feb. 6, 1926, [*Convention date*].

Non-conducting coverings for heat. — Thermal insulators are made from the material described in Specification 184,164, [*Class* 2 (iii), Dyes &c.], which is prepared by the action of sulphur chlorides on phenol-aldehyde condensation products with a filler of fibrous material such as asbestos, cotton fabric, paper or cardboard. Preferably the fibrous material is woven into a ribbon or fabric, plaited, felted or otherwise arranged so as to provide mechanical strength. In the process of making, the filler is first preferably dried, and then covered or impregnated. The material may be made in the form of sheets, boards, blocks, rods, cylinders, &c. which may be worked to the required shape.

266,147. Gaskell, W. H. March 10, 1926.

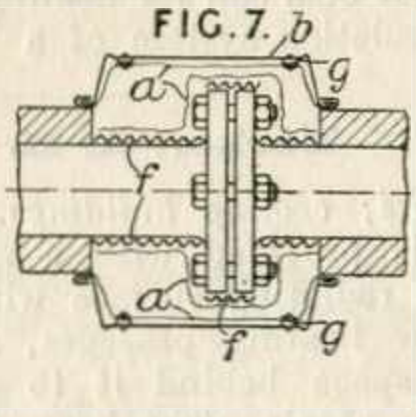
Heating buildings.— In systems for supplying hot water for baths &c. or for heating radiators, a boiler A is connected by a flow pipe B to the middle of an expansion tank C below the normal water level, the tank being provided with a hand-operated relief valve F. The return pipe D supplies the radiators &c. K, and is also connected by a pipe J to a float - valve controlled cold-water supply tank G. Any discharge from the valve F is received by the tank G.



266,177. Schmidt, E., and **Dyckerhoff, E.** May 14, 1926.

FIG.1.

FIG.7.



Non-conducting coverings for heat. — A heat-insulating covering comprise the provision of one or more layers of air or air-spaces bounded on one or more sides by sheets of bright metal foil. In the example shown in Fig. 1 multiple layers of flat foil *a* are mounted in supports *b* and protected by thicker sheets *c*. In Fig. 7 a flange joint for pipes is provided with a protective cap *b* and layers of bright metal foil *a*, preferably aluminium, supported by material *f*, *g*, for example asbestos. The use of crumpled foil, loosely packed into a cavity, is mentioned as

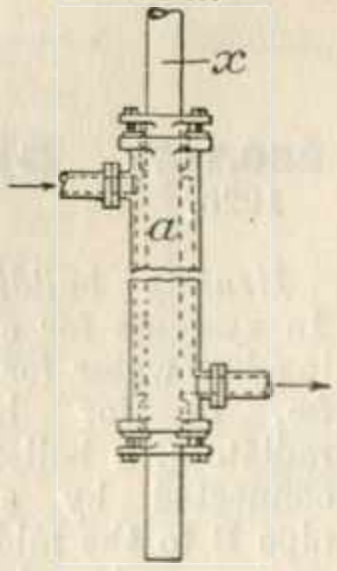
well as the application of the bright foil to the lining of cloaks, boots, hats, &c.

Reference has been directed by the Comptroller to Specifications 124,609 *and* 143,219, [both in *Class* 29, Cooling &c.].

266,499. Ransom, A. Jan. 2, 1926.

Heating buildings. — The circulation of water in a heating system is accelerated by the application of a steam or hot-water jacket or heater to a part of the system in which water is rising. The flow pipe *x* may be surrounded by a jacket *a* through which steam or hot water is circulated, or the heating medium may pass through a pipe within the flow pipe. The auxiliary heat may be obtained from a hotter part of the same system or from another system. The Provisional Specification mentions also the use of hot air or gas as the auxiliary heating medium. Specifications 14473/99 and 14474/99 are referred to.

FIG.1.

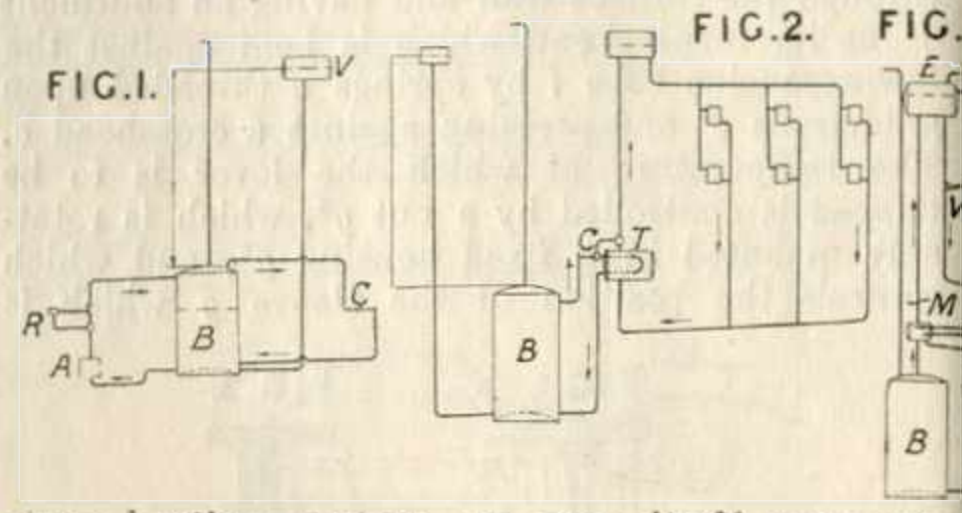


266,713. Beaurrienne, A. Feb. 27, 1926, [*Convention date*].

Heating by circulation of fluids; heat-storing apparatus.—In systems of the kind comprising a water tank B, Fig. 1, provided with a breather-pipe and connected to an expansion vessel V and a heat-radiating element C, the supply of heat to the tank B from a steam ejector or steam surface heater A is regulated by a device R so as to maintain a constant temperature at the hot inlet to the tank B. As shown in Fig. 2, the heater C may consist of a coil for heating a secondary hot-water circulation system of a building, the flow in the circuit B, C being regulated by a thermostat T in the riser pipe of the secondary system. In modifications, the hot water from the tank B may be mixed with the water of a secondary system, or may generate steam in a low-pressure

FIG.2. FIG.

FIG.1.

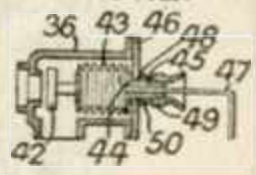


steam-heating system, or may itself evaporate in an expansion tank at a high level, the condensate being returned by a pump. In the arrangement shown in Fig. 6, the water from the tank B may enter a mixer M from which a riser pipe leads to a vessel E in which evaporation takes place. The return flow to the mixer is regulated by a valve V2 controlled by the pressure in the evaporator E and the flow in the circuit B, M by a valve V1 controlled by a thermostat in the mixer.

266,747. Silica Gel Corporation, (Assignees of *Miller, E. B.*). Feb. 26, 1926, [*Convention date*].

Thermostats.—The expansible fluid of a thermostat for controlling a valve 42, Fig. 12, of a refrigerating system fills a pipe 47 and a bellows chamber 43, the wall of the bellows being secured to a flange 44 of a tube 45 welded at 48 to the cover 46 of the valve chamber. To relieve the welded joint of stress a nut 49 screwing on to the tube 45 compresses a sleeve 50 against the cover 46. The valve member 42 is directly connected to the bellows.

FIG.12.



266,817. Barker, A. H. Dec. 4, 1925.

Radiators; cooling buildings. — A radiator is provided with a substantially flat radiating surface with relatively few heating passages, and an enclosed space behind it to prevent circulation of air. The heat-radiating plate A is provided with passages *a* for the heating medium, and with an enclosed space B bounded by a heat-reflector C at the back. The plate A may have a marginal flange a^1 and lugs a^2 to receive screws *c*. The plate A may also carry brackets to support the radiator. A large radiator may be built up in several sections the passages in which are connected together by hollow screwed plugs. Instead of a reflecting plate C a non-conducting sheet of felt may be used.

FIG.1.

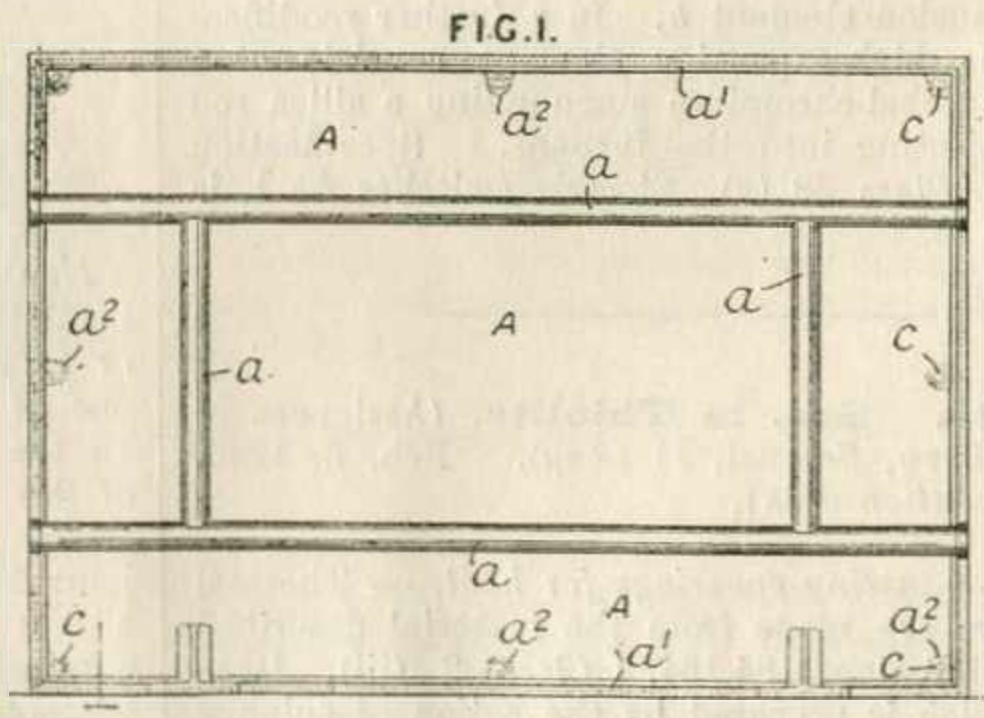
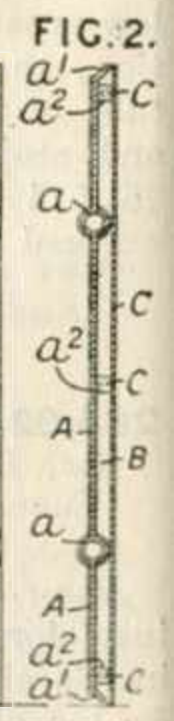
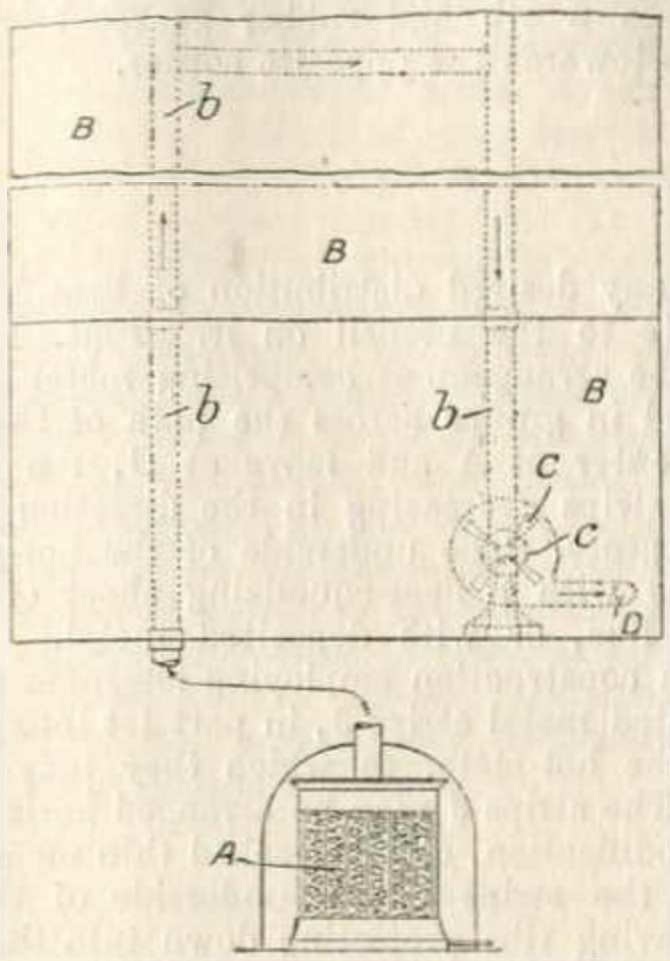


FIG.2.

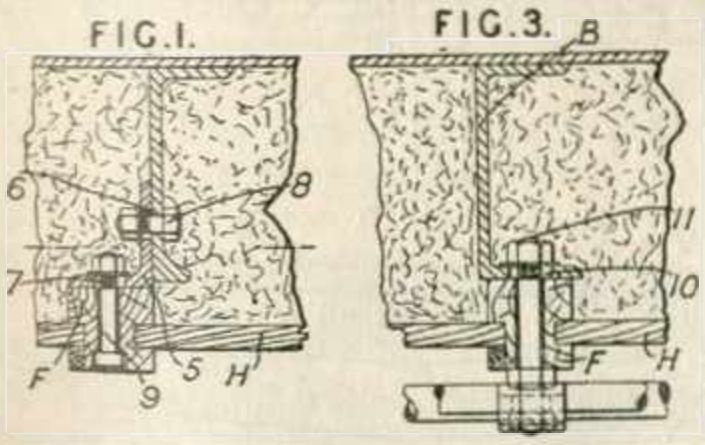


266,836. Barker, A. H. Dec. 8, 1925.



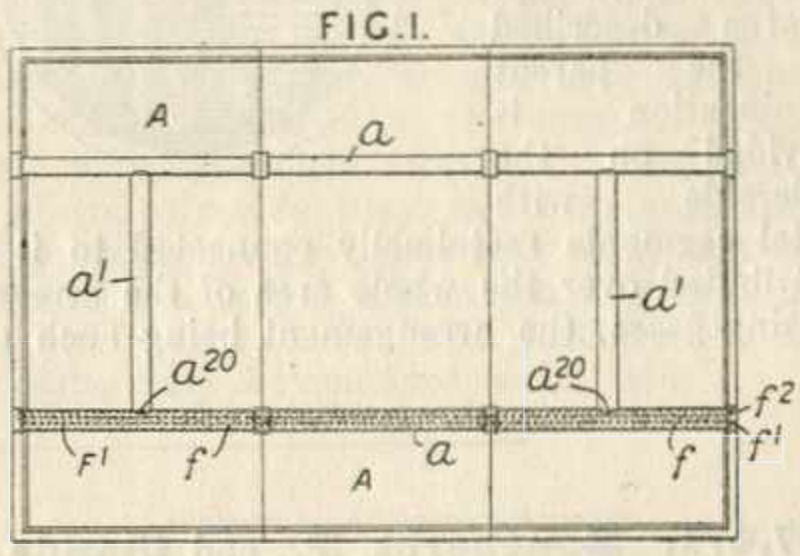
Radiators.—A radiator comprises a metal plate formed with conduits, and intended to be affixed to a wall or ceiling, in combination with a fan or pump for drawing hot combustion products from a gas fire or burner through the conduits. The fan C is driven by an electric motor *c* and may be carried on the inside of a movable panel forming part of the radiating plate B. The combustion products from the stove A traverse the conduits *b* and are discharged through an outlet D leading to the exterior of the building; the conduits may protrude into a space behind the plate. The stove may be replaced by a burner carried by the plate.

266,989. Thomson, E. A. Aug. 6, 1926.
Addition to 224,716 *and* 257,723.



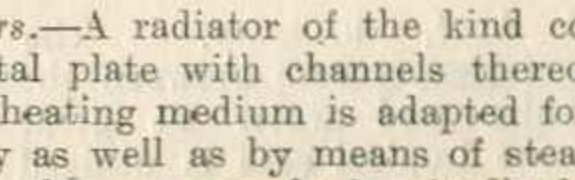
Non-conducting coverings for heat.—The wood grounds F of cold-storage walls described in the parent Specification are attached to angle-irons 5, Fig. 1, or to the flanges of beam members B, Fig. 3, in such a manner as to permit of adjustment in a plane parallel with the plane of the linings H. For this purpose the beam flanges or angle-irons have slots 10 and 7 for the securing bolts 11 and 9. The angle-irons 5 may also have slots 6 for the bolts 8 attaching them to the beams, whereby adjustment perpendicularly to the lining is permitted. The insulating washers or liners around the bolts and on the faces of the angle-irons or flanges described in the parent Specification may be employed. Where the flanges or angles of the beams are not parallel with the plane of the linings H, for example at the bow or stern of a ship, wedges of hard wood may be employed on one or each face of the flange or angle to obtain proper setting of the wood grounds, the bolts passing through these wedges. Or the flanges or angles or wood chocks may be set with their faces at suitable angles to give proper alignment.

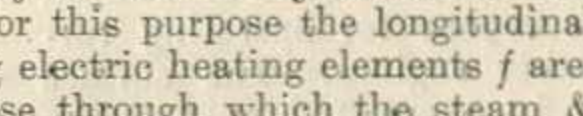
267,044. Barker, A. H. Dec. 4, 1925.



Radiators.—A radiator of the kind comprising a flat metal plate with channels thereon to enclose the heating medium is adapted for heating electrically as well as by means of steam or hot water. For this purpose the longitudinal channels enclosing electric heating elements *f* are separated from those through which the steam &c. passes, and this is done by stopping off the transverse channels a^1 at a^{20}.

267,083. Waters, C. B., and **Steindler, L. L.** March 3, 1926, [*Convention date*].

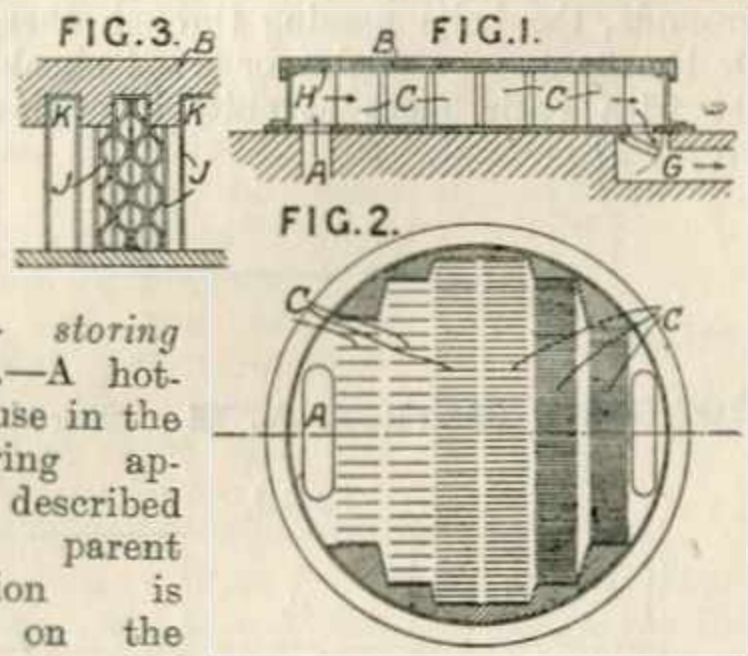




Footwarmers. — A footwarmer heated by the circulating water of an internal-combustion engine comprises two castings 27, 31 which are spaced by a gasket 33 and connected together by

bolts 32 the size of which is so chosen that they will fracture if the water freezes. Ribs 35 and air holes 37 are provided; the water enters and leaves by holes 29, 30. If the warmer is made square in plan these two holes may be adjacent one corner and separated by a partition which comprises a rib and rubber gasket and which extends towards the opposite corner.

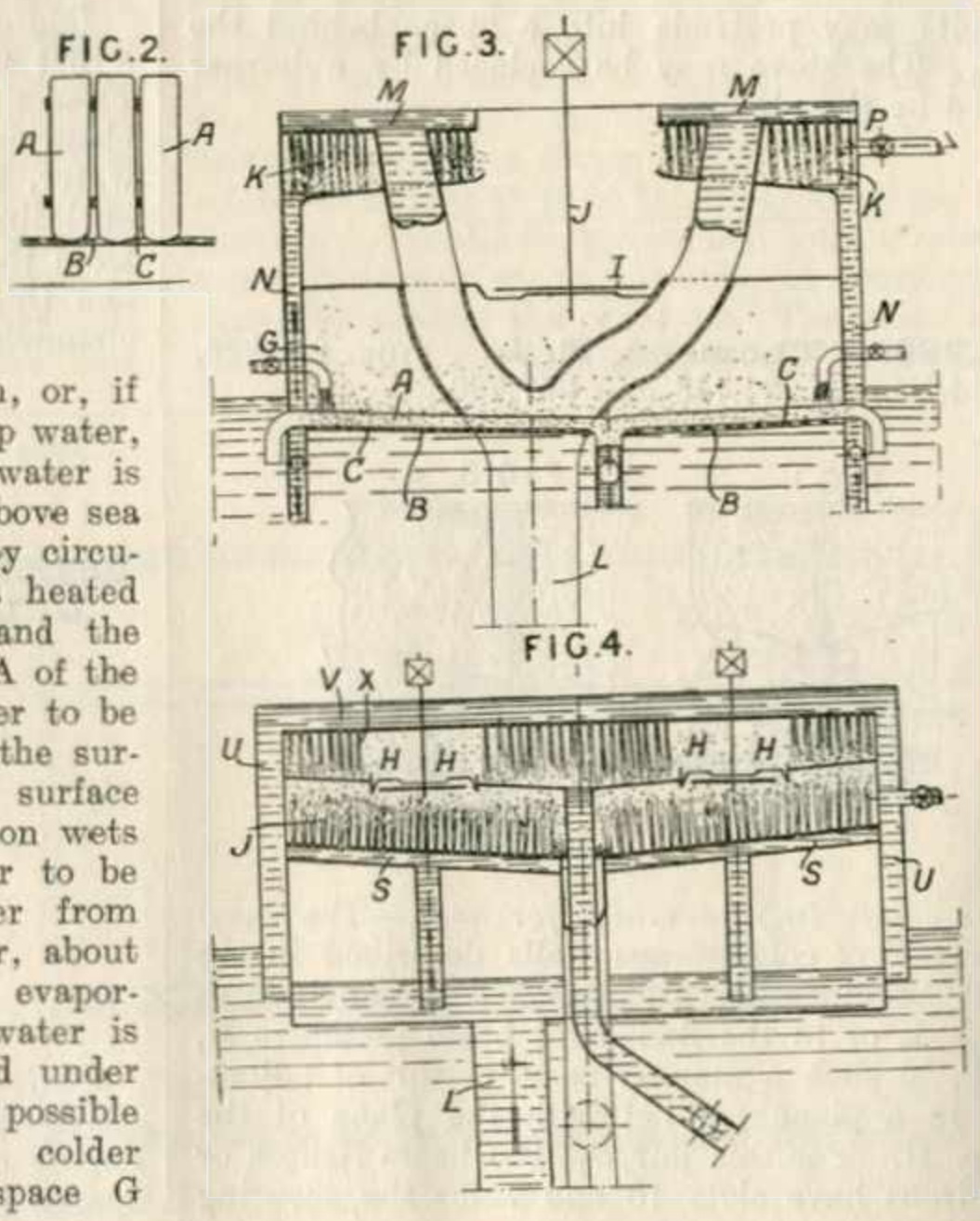
267,119. Seehaus, P. March 2, 1926, [*Convention date*]. *Addition to* 263,827.



Heat - storing apparatus.—A hot-plate for use in the heat - storing apparatus described in the parent Specification is provided on the underside with metal segments metalically connected to it and distributed over the whole area of the stream of heating gases, the arrangement being such as to secure any desired distribution of heat from the hot-plate to the utensil on it. Figs. 1 and 2 show one arrangement comprising metal strips C arranged in groups across the path of the gases, which enter at A and leave at G, the spacing of the strips decreasing in the direction of flow of the gases. The underside of the hot-plate is provided with a heat-equalizing sheet of copper or the like, or with deposited metal. Fig. 3 shows a construction employing alternate flat and corrugated metal strips J, in part let into grooves K in the hot-plate, to which they may be soldered. The strips J may be arranged horizontally. In a modification, closely-packed thin metal tubes replace the strips J, the underside of the hot-plate having ribs projecting down into the mass. Instead of plates or tubes metal shavings or metal wool may be used.

The Specification as open to inspection under Sect. 91 (3) (a) states that the device may be used in combination with other ranges. This subject-matter does not appear in the Specification as accepted.

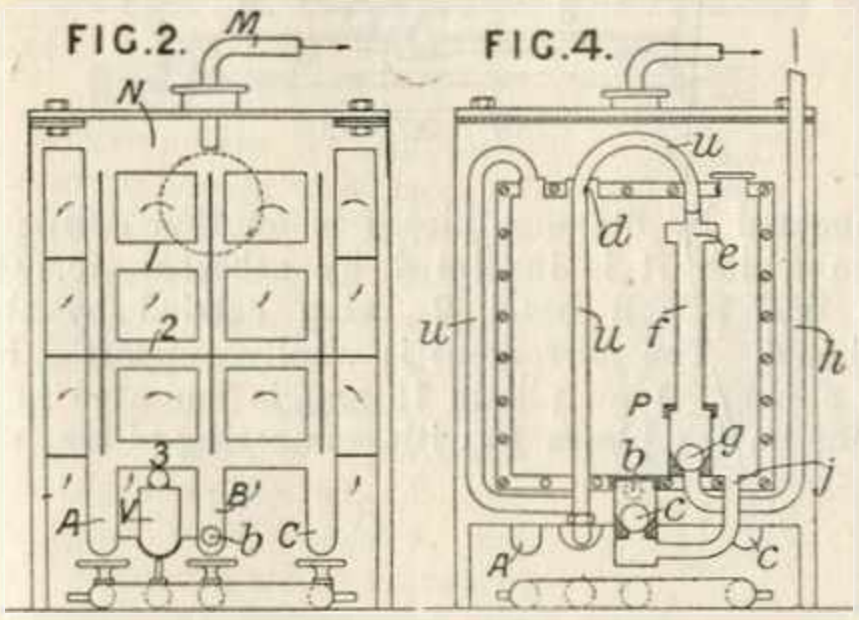
267,471. Boucherot, P., and **Claude, G.** March 13, 1926, [*Convention date*].



Natural heat, utilizing. — The difference of temperature between the surface water and water at great depths in the tropical seas is utilized to generate vapour for operating turbines or other engines. The surface water may be at 25°-29° C. and the water at 1000 metres depth may be at 4-5° C. The cold water may be brought up through a pipe to a floating platform, or, if the power house is on the coast near deep water, through a tunnel in the ground. The water is utilized at a height of about 10 metres above sea level to minimise the power consumed by circulating pumps. A platform B, Fig. 3, is heated by the warm surface water below it, and the warm water is also passed through tubes A of the cross section shown in Fig. 2. The water to be evaporated flows in a thin sheet C over the surface B and in contact with the lower surface of the tubes A, and the water in ebullition wets the whole of the tubes A. The water to be evaporated may be condensation water from surface condensers, or surface sea water, about one quarter of the water circulated being evaporated. Alternatively, the warm surface water is introduced into a boiler and evaporated under reduced pressure, which is as nearly as possible the maximum vapour tension of the colder water. The vapour produced in the space G

operates a steam turbine I and passes directly into a condensing space J. Cold water is drawn through the pipe L and sprayed from a chamber M on to packing material K to maintain the vacuum, and condensation water is drawn off through pipes N. Liberated gases may be drawn off by pumps P. The jet condenser may be replaced by a surface condenser. In Fig. 4, cold water is drawn up through a pipe L into compartments S and sprayed into a chamber J to maintain a vacuum. Warm water passes up through pipes U to a chamber V and is sprayed into space X where it is partly vaporized. The vapour drives turbines H, and passes into the condenser chamber J. The water is raised to the required points by the external atmospheric pressure. The operation of the plant is controlled by the circulating pumps, if used, or by varying the immersion of the floating platform, while the speed of the turbine may be controlled by admitting air to the condenser.

267,511. Savary, T. March 6, 1926, [*Convention date*].



Heating buildings. — A hot water heating-system in which the water circulation is accelerated by a pulsometer comprises a water-jacketed boiler having a steam generator V and water elements A, B, C heated by gas burners, a semicircular-sectioned pulsometer P detachably secured to the end of the boiler, and an expansion vessel. The water elements communicate with one another through transverse ducts 1, 2, 3 and at their upper ends open into a water-space which communicates through a pipe M with the radiators, while the steam generator communicates through branched pipes *u* with the upper part of the pulsometer and the perforated enlargement *e* of the pipe *f* which is connected by a pipe *h* with the expansion vessel. The products of combustion from the burners pass to the upper part of the boiler in a zig-zag path formed by baffles, while steam passes from the generator V through the pipes *u* to the pulsometer thus forcing the water through the port *j*, past the ball-valve *c*, and through the pipe *b* to the water element B of the boiler. Water is thus forced from the boiler to the radiators and thence into the expansion vessel and the pipe *h* as far as the ball-valve *g*. The uncovering of the port *j* results in the steam flowing therethrough and reducing the pressure in the pulsometer, and water being drawn into the pulsometer through the perforations in the enlargement *e* and the opening *d* in the pipe *u*. The admission of water into the pulsometer condenses the steam therein and augments the pressure-reducing action of the steam flowing through the part *j*. The impetus given to the water in the pipe *u* carries a portion of it to the steam generator V.

267,907. Bachmann, W. March 18, 1926, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

Non-conducting coverings for heat and sound. —Silica of high adsorption capacity is obtained by reacting silicon fluoride with a limited amount of water. The silicon fluoride may be reacted with steam, or water in the form of a spray, which may be mixed with air. Alternatively, the silicon fluoride may be introduced into a solution of hydro-fluosilicic acid which acts as a diluent of the water. The silica is very voluminous and may be used as an insulator for heat. The silica may be moulded while moist.

268,011. Haddan, A. J. H., (*Celite Co.*). Dec. 18, 1925. *Drawings to Specification.*

Non-conducting coverings for heat.—A voluminous almost gelatinous mass of hydrated calcium metasilicate is produced by treating finely ground silica (diatomaceous earth &c.) with lime in the presence of water, with or without heating. Instead of lime, oxides or hydroxides of magnesium, strontium or barium may be used. The product is dried and pulverized, or the wet mass may be calcined and carbonated during or after calcination. Examples of the process are given, in one of which the reaction takes place in a closed tank and the suspension of silica is highly concentrated to produce a fine product, which may be used for heat insulation.

268,317. Berliner, E. March 24, 1926, [*Convention date*].

Non-conductive coverings. — A wall specially suitable for churches, concert halls, &c. is constructed with plurality of hollow cells adjacent its inner surface to impart the characteristics of

diaphragms. In one construction, the cells are formed by securing troughs 2, Fig. 2, of cardboard, wire mesh, foraminous metal, &c. and of round or other section, to the base plaster 1 by nailing or otherwise, and applying a finishing layer 4 of ordinary plaster, cement, &c. but

FIG. 2.

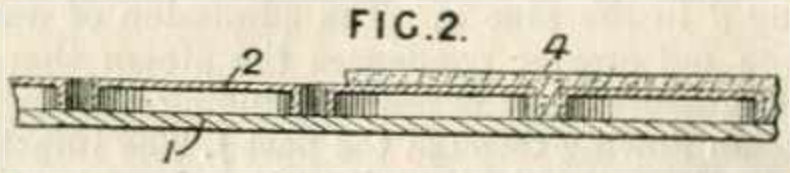
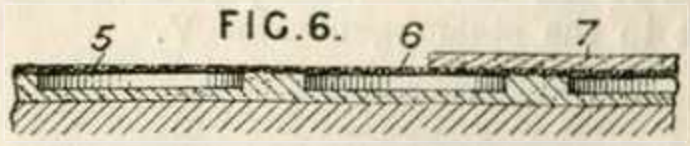


FIG. 6.



preferably the so-called acoustic plaster comprising a mixture of plaster, cement, &c. with a filler such as sawdust &c. This layer fills in the spaces between the cells. In another construction, cellular recesses 5, Fig. 6, are formed in the base plaster over which a sheet 6 of paper, cardboard, gauze, &c. is secured and the finishing plaster layer 7 finally applied.

268,430. Negretti, H. N., Negretti, P. E., Zambra, M. W., and **Ibbott, H. W.** Dec. 31, 1925.

Thermostats. — A temperature indicator suitable for fitting into an oven door comprises a bimetallic element 1 composed of bars having different coefficients of expansion which are united by brazing &c. at their ends only and are drilled at 2. At one end 4 the bars are also drilled and slotted at 3 so that this end constitutes a rocking piece the movements of which are transmitted to the indicator. The element 1 is mounted in a diametral recess in the back of a thin metal casing 5 so as to be directly exposed to the heat of the oven and is loosely connected to this casing by a screw 18. The casing 5 is

FIG. 1.

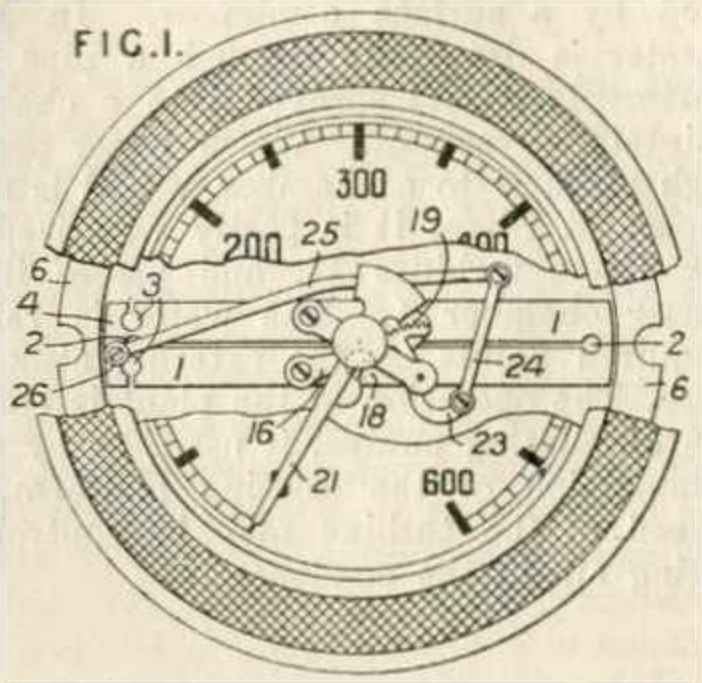
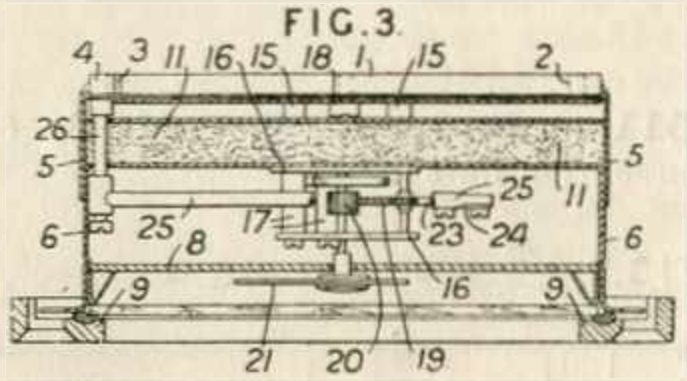


FIG. 3.

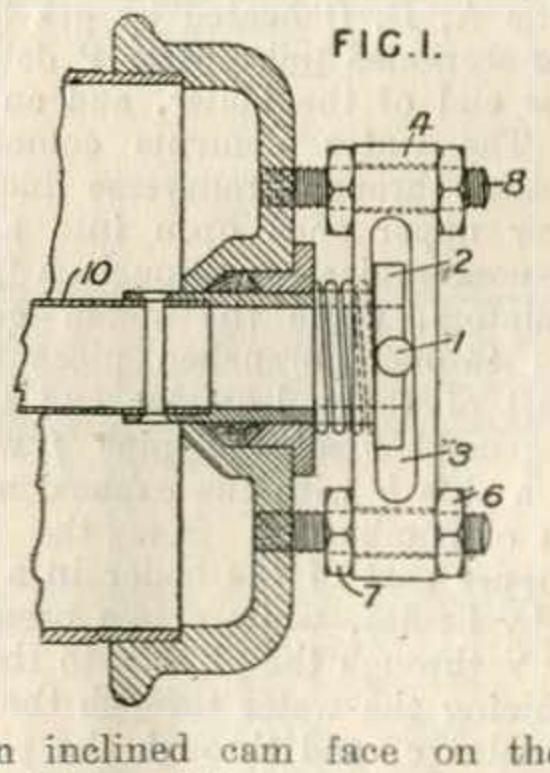


connected by distance pieces to another casing 6 from which it is insulated by asbestos &c. 11, the dial 8 and bezel 9 being carried by the casing 6. The movement is wholly supported by the element 1 on pillars 15 and is mounted in a frame having plates 16 with connecting pillars 17.

268,551. Barty, T., and **Westinghouse Brake & Saxby Signal Co., Ltd.** April 6, 1926.

Thermostats.—In a steam heater, particularly applicable to railway vehicles, a thermostatic element 10 carrying a control valve (not shown) is attached to an adjusting device 2 provided with a projecting pin 1 engaging with an inclined slot 3. The member 4 in which the slot 3 is formed is mounted on studs 8 between nuts 6, 7, so that it is longitudinally adjustable relatively to the element 10. The element 10 and valve may thus be adjusted longitudinally by rotation of the element 10, while the initial position of the thermostat can be varied according to the length of heating unit employed by moving the member 4 to or from the casing. A modification is described in which the pin 1 engages

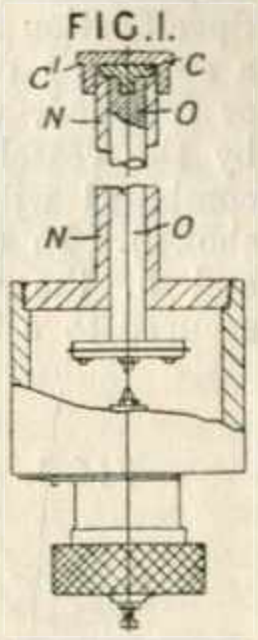
FIG. 1.



with an inclined cam face on the member 4 instead of in a slot.

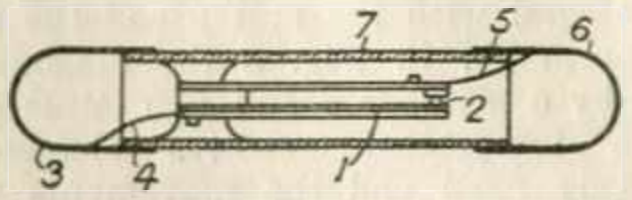
268,645. MacLaren, R. Sept. 13, 1926. *Addition to* 254,821, [*Class* 38 (v), Electric switches &c.].

FIG. 1.



Thermostats. — Thermal switches of the kind described in the parent Specification, are modified by connecting the expanding sleeve N to the end of the non-expanding rod O by means of a cap C screwing into the rod O and an external cap C^1 to clamp the cap C into place, or alternatively by means of a pin passing through the sleeve and rod.

268,739. Siemens - Schuckertwerke Ges. April 1, 1926, [*Convention date*].



Thermostats. — In temperature regulators in which the heating circuit is interrupted by the movement of a thermal element, e.g. a bimetallic strip 1, within a tube from which air is excluded, the tube is made in part of metal so that heat is readily transmitted from the surrounding atmosphere to the thermal element. The glass tube 7 may have metal caps 3, 6 connected by heat and electricity conducting leads 4, 5 to the strip 1 and co-operating contact 2, or the central part of the tube may be of metal and the ends of glass.

268,810. Jerike, J. March 31, 1927. [*A Specification was laid open to inspection under Sect.* 91 *of the Acts, April 4, 1927*].

FIG. 1.

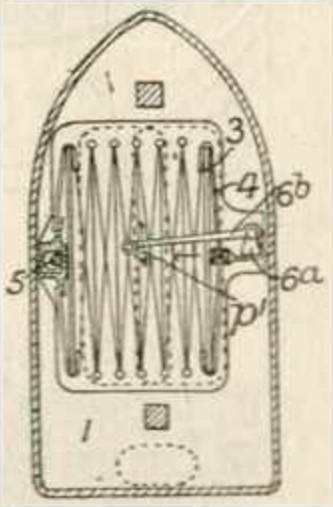
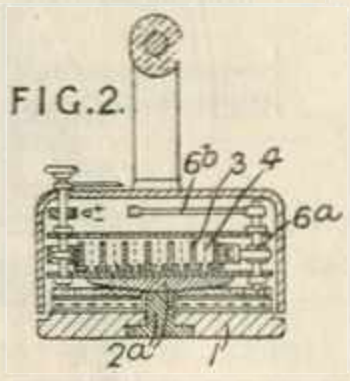


FIG. 2.



Thermostats. — An electrically heated flat iron is maintained at a constant temperature by the use of a thermal switch as described in Specification 268,812. The thermal element comprises a series of rigid brass or aluminium bars 3 and diagonal steel bands 4, and the temperature to be maintained is determined by adjusting an eccentric 5. Uniformity of temperature between the base plate 1 and the thermal element is maintained by an element 2^a of copper. One end of the thermal element is attached to the short arm 6^a of a bell-crank lever, the long arm 6^b of which may have a constraining force applied to it in the direction p^1, and may operate any desired contact device for varying the heating. A modification is described (Figs. 3 and 4, not shown) in which the thermal element is arranged at right angles to that of Fig. 1, and a controlling spring completes the circuit. Specification 268,811, [*Class* 38 (v), Electric switches &c.], also is referred to.

268,812. Jerike, J. April 3, 1926, [*Convention date*].

FIG. 9.

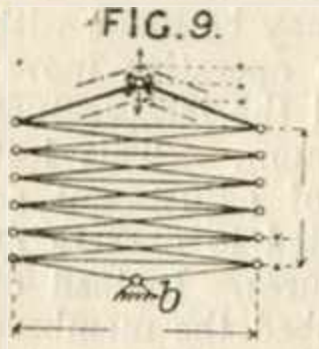


FIG. 23.

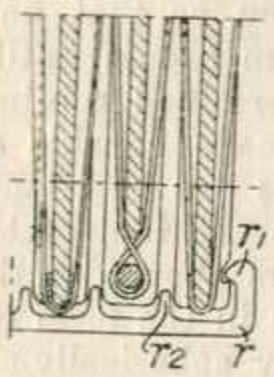


FIG. 12.

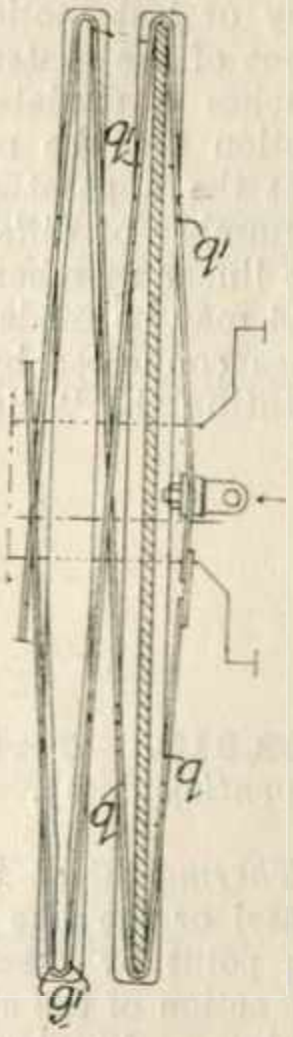


FIG. 1.

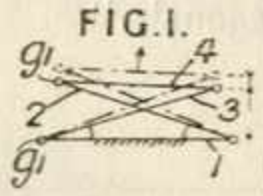


FIG. 2.

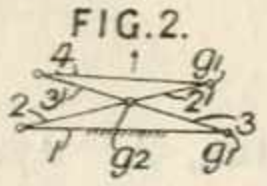
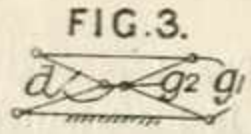


FIG. 3.

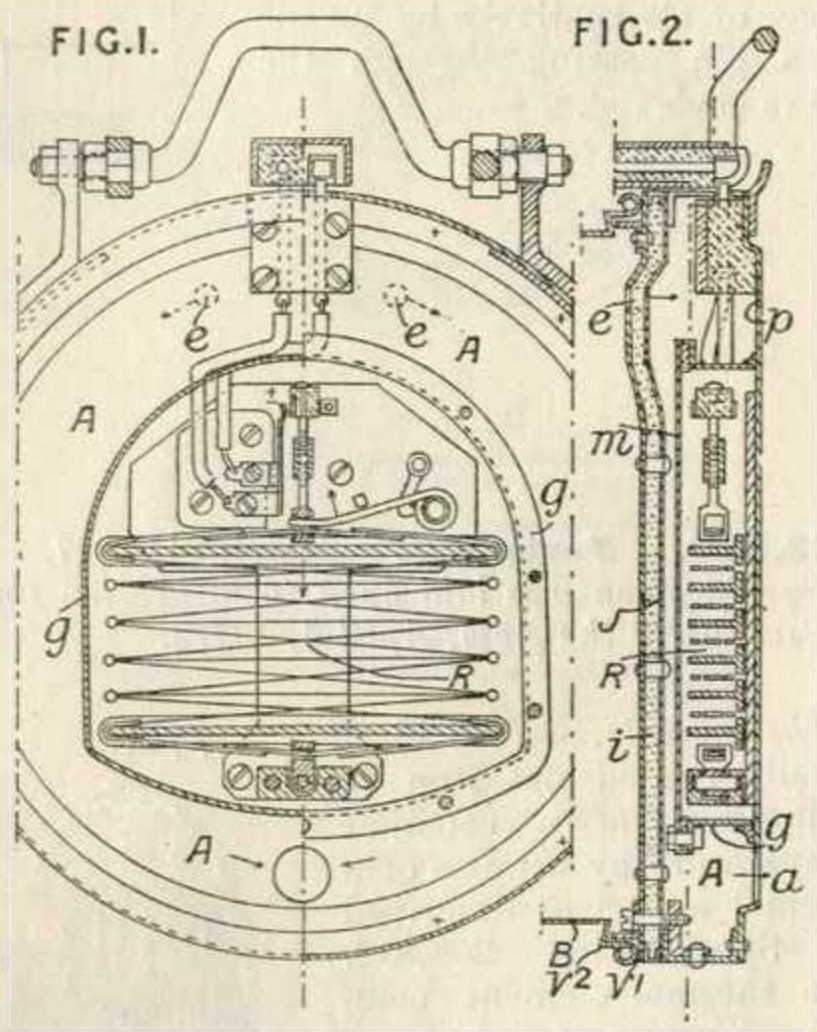


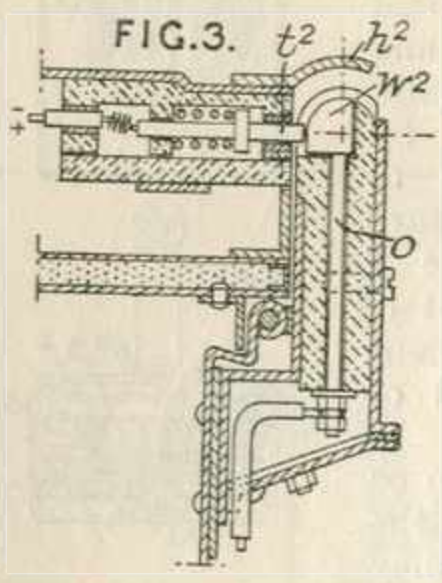
Thermostats. — Apparatus depending on the differential expansion of metals for use as a thermometer or for thermostatic control comprises an expansion member consisting of one or more elements each comprising two similar parallel members 1, 4 connected by diagonal members 2, 3 having a coefficient of expansion differing from that of the members 1, 4 the diagonals being connected to the members 1, 4 by hinges or the equivalent g^1, of such form that changes in the distance between the members 1, 4 are produced as a result of temperature changes by stresses acting along the diagonals, without any bending of the members taking place. In Fig. 1, the diagonals are not connected to each other in any

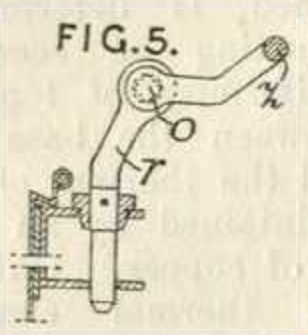
at the point at which they cross; in Fig. 2 they are connected by a single joint g_2 at their point of intersection, in which case the arm 2 may be integral with the arm 3 and the arm 2^1 with the arm 3^1; in Fig. 3 the diagonals are connected by a member d and two joints g_2. In using the temperature-sensitive element the member 1 is fixed and the movements of the member 4 towards or away from the member 1 are utilized for measuring or controlling temperature. Fig. 9 illustrates a number of elements connected together in series to produce a magnified movement. When a number of elements are used as in Fig. 9 the diagonal members may consist of unitary steel bands q, q^1, Fig. 12, passing through the system and soldered to the parallel members or to caps fitting over the said members. The base b, Fig. 9, may be adapted to be adjusted in position by means of a screw and the lengths of the parallel members may be adjustable as by a right-and-left handed screw arrangement inserted in their length. In order to ensure the parallelism of the members 1, 4, distance pieces r, Fig. 23, may be employed having claws r_1 and tongues r_2 fitting between the parallel members. The joints between the parallel and diagonal members may be made with play or lost motion so that no operative movement of the system occurs until the temperature reaches a predetermined minimum. This lost motion may be made capable of adjustment so that the apparatus can be adapted to operate at a number of different temperatures. Instead of the linear members above described the members 1, 4 may be made in the form of parallel circular rings connected by spherically-curved plates constituting the "diagonals."

268,813. Jerike, J. April 3, 1926, [*Convention date*].

Thermostats.—The temperature of a cooking-vessel or the like is maintained at or about boiling point by means of a thermostat subject to the action of the steam which controls the heating device. An electric heater is preferably used, controlled directly or through a relay by the thermal switch. Figs. 1 and 2 show the lid of the vessel from below, and a section of the lid respectively. The lid A rests within a recess v^2 of the vessel B, and comprises a plate p and an insulating plate J containing asbestos i, enclosing a steam-tight casing g, m containing the thermostat R. When steam is not passing through the openings e, a to heat the thermostat, the latter is cooled by the atmosphere. The opening e may be provided with a valve and strainer. Alternatively, the thermostat may be placed above the plate p where it is cooled more rapidly by the air, and in that case is heated only by conduction from the plate p. Several vessels may be superposed, only the lowest being heated, and may be placed under one steam-tight cover. The thermostat is preferably that described in Specification 268,812, and a snap-action switch may be employed or the switch described in Specification 268,811. The lid A is provided with a switching device operating when it is removed or replaced, which may comprise a plug carried by the vessel and a socket carried by the lid, combined with a watertight casing (Fig. 6, not shown). In an alternative construction, Figs. 3 and 5, the vessel carries two ports r rigidly secured to a bent member z which forms a support for the lid when opened on a hinge constituted by the fixed spindle o. The electric contact w^2 has a surface concentric with the spindle o and a spring-pressed pin t^2 slides over it to maintain contact when the lid is opened. The contacts are protected by a projection h^2. A single lid may be employed with a group of cooking vessels having rims of the same size, or if of different sizes corresponding projecting rings are provided on the lower surface of the lid. Several cooking-vessels may be controlled by a single thermostat.



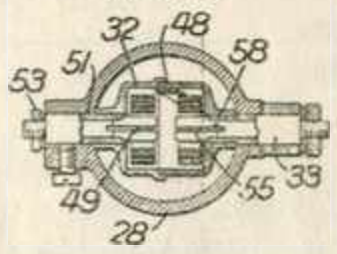




268,905. Hughes, R. M., (*Hopewell Bros.*). Jan. 25, 1926.

Thermostats. — A carburetter valve 32 is hollow and contains a bimetallic strip 48, Fig. 3, each half of which is wound as a spiral; the end 49 of one of the spirals is clamped to a fixed sleeve 51 upon which the valve 32 rotates, the end 55 of the other spiral being clamped to a hollow shaft 33 which is secured to the valve by a key 58. As the temperature of the air in the inlet 28 rises, the valve 32 opens in a clockwise direction, a cold air inlet remaining closed until the valve 32 approaches the fully open position, and then opening rapidly as the valve 32 moves beyond the fully open position.

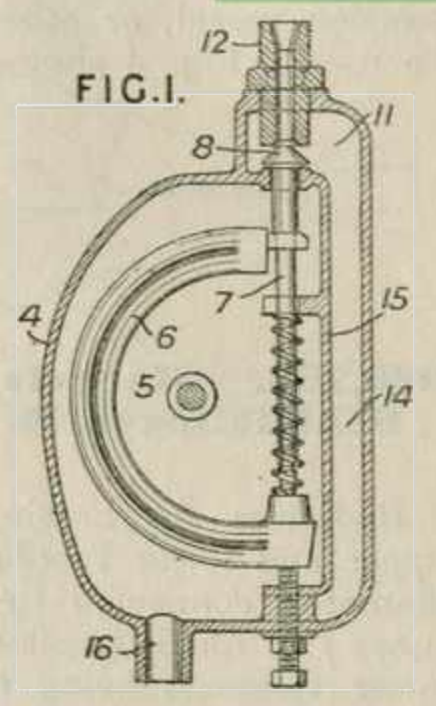
FIG. 3.



269,304. Pugh, J. W. March 15, 1926.

Steam traps. — A D-shaped casing 4 is provided with a compartment 5 containing a thermostatic element 6 which operates the spindle 7 of a valve 8 controlling the outlet of the steam pipe 12 in the manner usual in this type of trap. The outlet compartment 11 is extended by a passage 14 along the straight side of the casing, and has its outlet in the lower end of the compartment 5. On the opening of the valve 8, water of condensation is first discharged through passage 14 and outlet 16, and when this is followed by steam, the element 6 is heated and the valve closed. In a modification, the wall 15 may be perforated, and the trap may be used with the passage 14 horizontal.

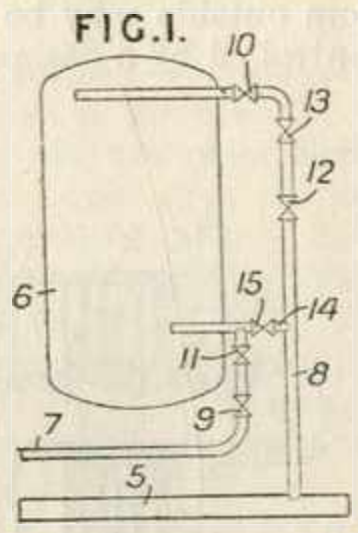
FIG. 1.



269,308. Peters & Co., Ltd., G. D., and **Congleton, (J. B. M. Parnell), Baron.** March 19, 1926.

Heating vehicles. — In a steam heating system for railway vehicles, steam at high pressure is stored in accumulators 6 placed at each end of the train, each having an inlet pipe 7, and an outlet pipe 8 connected to the train pipe 5. Each pipe has a manually operated valve 9, 10, and a non-return valve 11, 12. A pressure reducing valve 13 is included in the pipe 8, and a cross connection 14 has a non-return valve 15 allowing steam to flow into the accumulator from the pipe 8. The accumulators may be charged with high pressure steam from a stationary boiler, or from the locomotive at the front and a shunting engine at the rear of the train. The train pipe 5 is connected to the locomotive in the usual manner, and its heating may be supplemented or replaced by steam from the accumulators.

FIG. 1.



269,437. Widström, A. D. July 19, 1926, [*Convention date*].

Thermostats.—A heat accumulating range having a heat-storage element 1 and one or more cooking or warming chambers 2 is provided with a thermostat 3 arranged to vary the conductivity of a heat conducting path between the storage element and the chamber so as to keep the latter as a constant temperature. In Fig. 2 a piston 4 is mounted on a sleeve 5 carried by an aluminium plate 8 on the top of the chamber 2.

FIG. 1.

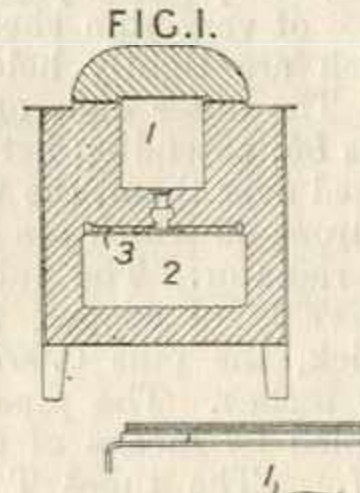


FIG. 4.

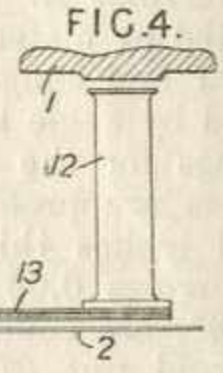
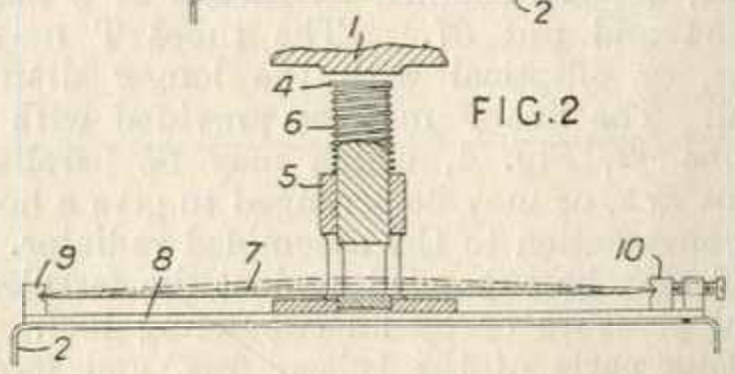


FIG. 2.



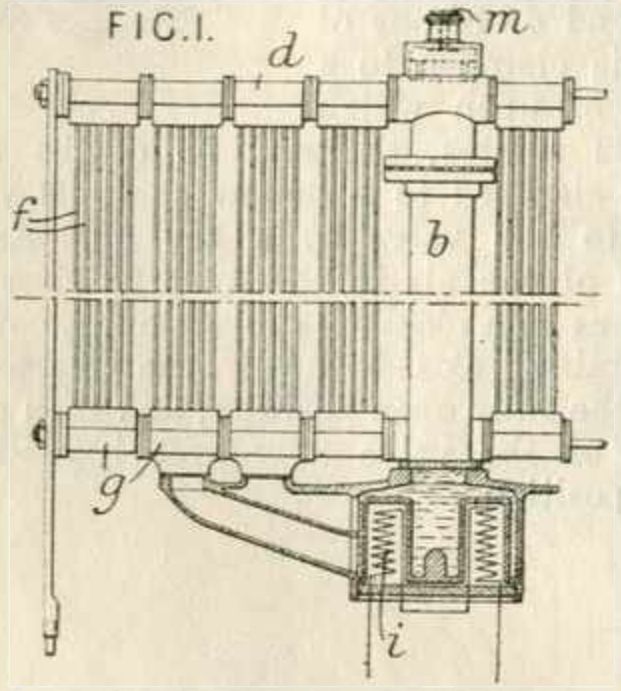
The piston is urged towards the storage element by a spring 6, but its position is also controlled by a leaf spring 7 of steel or nickel steel carried by supports 9, 10 on the plate 8. The parts 4, 5 are of good conducting material and the size of the air-gap between the piston and the storage element depends on the differential expansion of

plate 8 and the spring 7. In place of the thermostat described a bimetallic strip, an expansion vessel, or other type of thermostat may be used. Fig. 4 shows a copper bolt 12 carried by copper strips 13 and its position with respect to the storage element is varied by a thermostat or alternatively the part 13 constitutes a bimetallic strip.

269,769. Haegele, A., Zweigle, H., and **Schleiblinger, R.** Aug. 3, 1926.

Radiators for heating buildings comprise an upper and lower tubular element *d*, *g* of small diameter, connected by a plurality of groups of tubes *f* of much smaller diameter, the upper and lower elements being also connected by a feed pipe *b* having at its lower end an electric heater *i* for heating the contained water. Each bank of tubes *f* may be connected to a separate section *d*, *g* to form one of a series of connected units. A safety valve *m* may be fitted at the top of the riser pipe *b*. In each bank the tubes may be spaced more openly in the interior to facilitate air circulation.

FIG.1.



269,851. Trane, R. N. April 23, 1926, [*Convention date*].

Radiators.—In a radiator, a tube conveying heating fluid carries a number of spaced fins which are flanged and provided with ferrules to ensure good heat contact with the tube. The radiator, Figs. 1 and 2, comprises a pair of tubes T provided with fins F of very thin sheet metal, having flanges *f* which are tightly held on the tubes by ferrules R. The outer ends of the fins are protected by plates 85, extending between the end plates P and flanged over them, the whole being secured by angle irons 39 which are extended to form legs for the radiator. The tubes, fins, and ferrules are preferably of copper, the tube being 0.02 inches thick, the pins 0.007 inches, and the ferrules 0.03 inches. The pipe connections 32, 33, are coupled by means of a flanged collar 34 and nut 37. The tubes T may be circular, or elliptical with the longer diameter vertical. The fins F may be provided with corrugations 42, Fig. 4, which may be parallel in adjacent fins, or may be arranged to give a honeycomb construction to the assembled radiator. The tubes T may be expanded against the ferrules by internal pressure or by an expanding tool. The contacting parts of the tubes, fins, and ferrules may be previously coated with tin or solder, and the assembled article heated to fuse the coating and secure the parts. The radiator acts mainly by heating the air which flows through it.

According to the Specification as open to inspection under Sect. 91 (3) (a), the heating is preferably controlled by a damper in a casing enclosing the radiator instead of by valves controlling the heating fluid, and the damper may be actuated by a thermostat, Fig. 9, (*Cancelled*), not shown. The radiator may be arranged inside the hollow wall 132 of a building, Fig. 10, (*Cancelled*), which may have a metal lining 134. Air from outside may be admitted through a pipe 137 controlled by a damper 138, or it may be admitted

FIG.2.

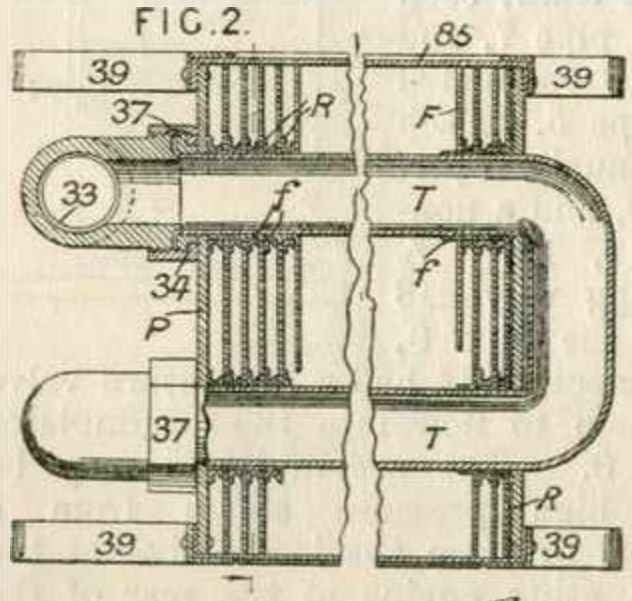


FIG.10.
(*Cancelled*)

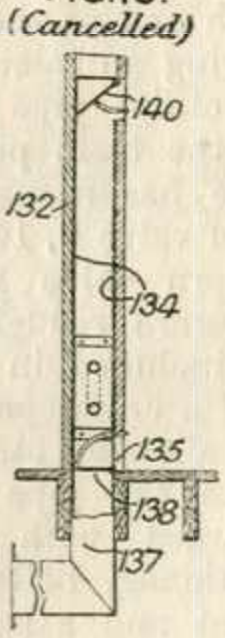


FIG.1

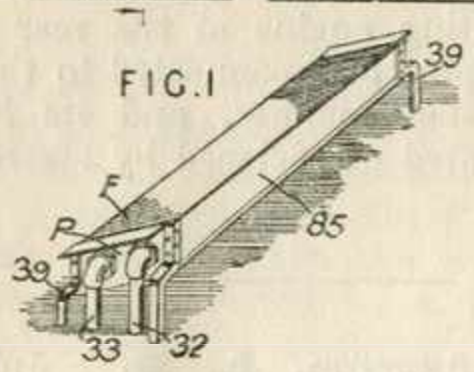
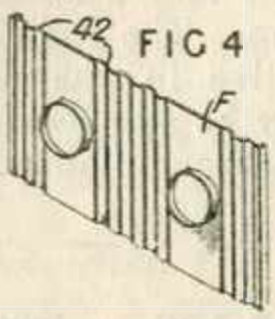


FIG 4

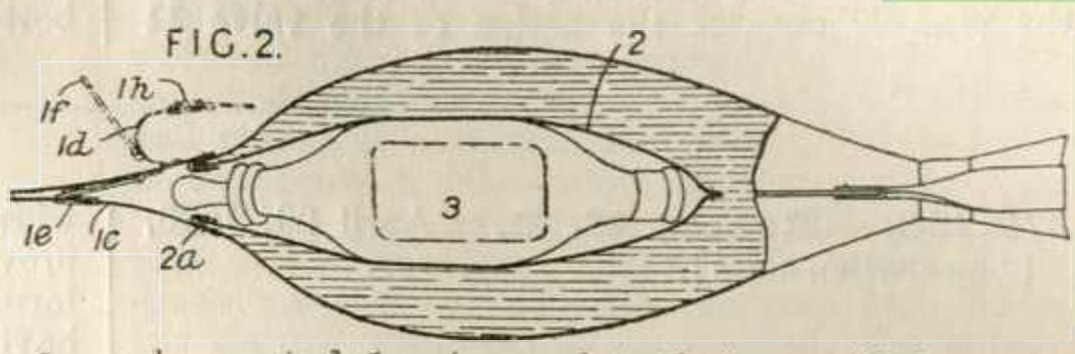


from inside the building at 135. An outlet passage for the warm air is controlled by a damper 140. Ths subject-matter does not appear in the Specification as accepted.

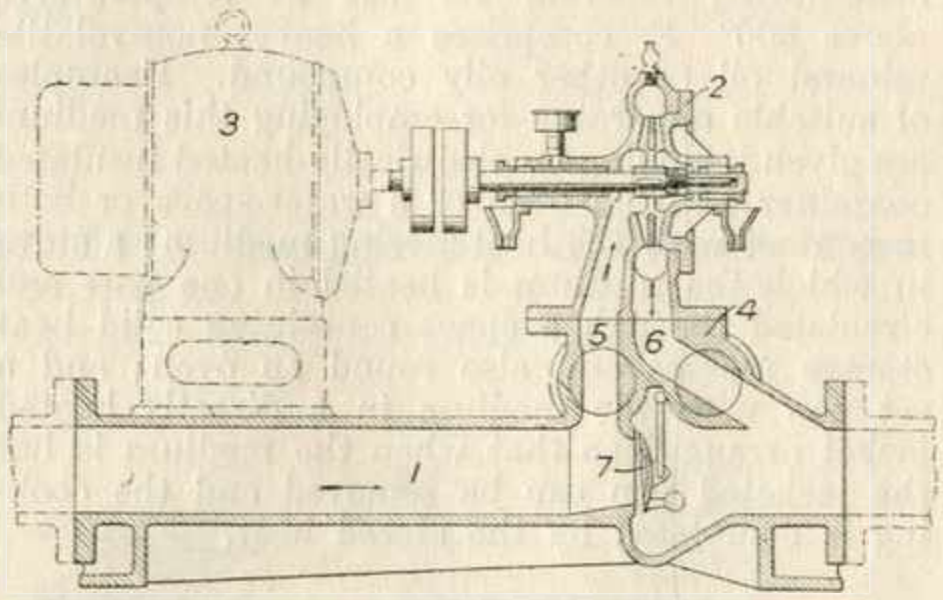
269,958. Furber, E. L. Jan. 16, 1926.

Hot-water bottles.—In a hot-water bottle of the kind provided with a pocket for keeping an article, such as a feeding-bottle, hot, the pocket 2 is formed of two strips of rubber joined at their edges, and attached to the bottle at 2*a* so as to provide an opening for the insertion of a feeding-bottle or the like, 3. The main body of the bottle is provided with a pair of flaps 1*c*, 1*d*, which may be closed over the pocket 2 and secured by a clip 1*f* of the suspender type held by a stud 1*e*. An eyelet 1*h* is provided to suspend the bottle for the purpose of draining.

FIG. 2.



269,984. Holden & Brooke, Ltd., and **Hall, D. L.** Jan. 29, 1926.

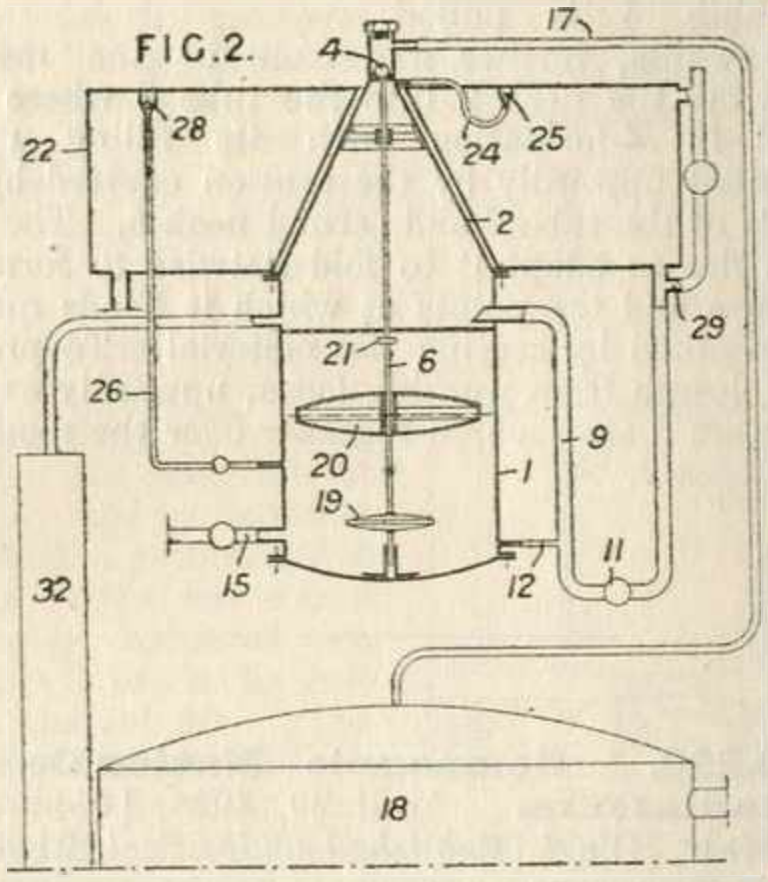


Heating by circulation of fluids.—Liquid circulating in a heating system is assisted by a motor-driven pump, the pump and motor or shaft pedestal being mounted on a single pipe section which is provided with a non-return valve. Any displacement due to mechanical coupling, strain in the pipes, or expansion, which would affect the alignment of the pump and motor or shaft pedestal, is thus avoided. The pipe section 1 carries a centrifugal pump 2, and motor or turbine 3, the pump being mounted on a part 4 having by-pass passages 5, 6. A non-return valve 7, which may be automatic or hand-operated, is provided in the pipe section 1.

270,113. Moreau, H. June 18, 1926.

Heating buildings.—Water is delivered into the heating plant through a pulsating tank by means of steam pressure, and thence to an expansion vessel which discharges into the pulsating tank when the pressure decreases, and the cycle is then repeated. Steam is admitted through a valve 4 at the top of a conical part 2 of the pulsating tank 1, and water is expelled through pipe 15 to the heating plant and then to an expansion tank. The water returns through pipe 9 having a non-return valve 11. The valve 4 is actuated by a float 20 through a rod 6. A small pipe 12 is provided to keep the valve 11 flooded, and a small pipe 24 connects the conical part 2 with the upper part of the expansion tank. The admission of steam to the conical part 2 ensures a gradual expulsion of the water. When the pipe 26 is uncovered ,a small quantity of steam escapes to the expansion tank, and condenses, and when the float 20 rests on the float 19 the valve 4 closes, and the steam is then gradually expelled through the pipe 26 to the expansion vessel. Water returns through pipe 9, and the valve 4 re-opens when the float 20 reaches the abutment

FIG. 2.



270,113. Moreau, H. June 18, 1926.

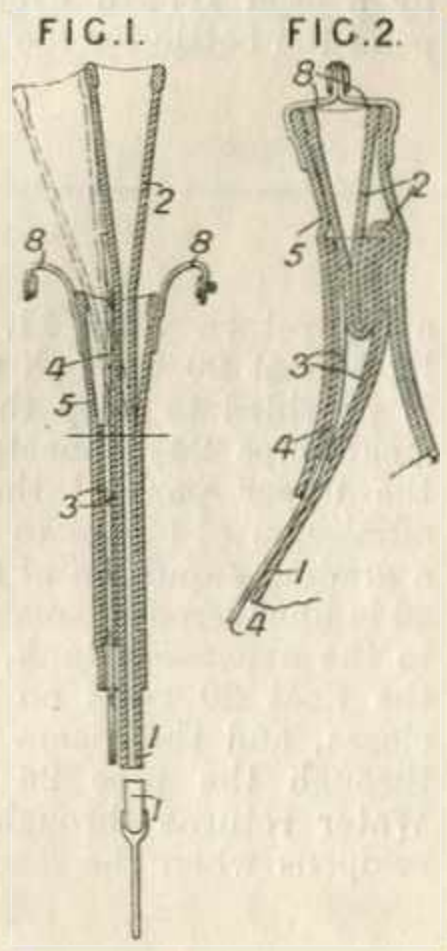
Heating buildings.—Water is delivered into the heating plant through a pulsating tank by means of steam pressure, and thence to an expansion vessel which discharges into the pulsating tank when the pressure decreases, and the cycle is then repeated. Steam is admitted through a valve 4 at the top of a conical part 2 of the pulsating tank 1, and water is expelled through pipe 15 to the heating plant and then to an expansion tank. The water returns through pipe 9 having 21 to admit steam to form a cushion. The upper layer of water becomes heated, and a new cycle commences. The small float 19 carried by the rod 6 is insufficient to lift the valve 4, but sufficient to maintain it open after it has been opened by float 20. The conical part 2 is surrounded by the expansion vessel 22. The tubes 24, 26, opening into the expansion tank, are provided with non-return valves 25, 28. An adjustable air intake may be provided, and the tank 1 may be connected with the boiler 18 through a vessel 32 to obtain rapid starting of the apparatus by the

admission of cooler water from the vessel 32. The admission of a limited quantity of air through the pipe 29 ensures the action of the valve 11 without excessive noise, or alternatively this may be ensured by connecting the pipe 9 to the bottom of the tank 1.

270,256. Reach, M. B. April 29, 1926, [*Convention date*].

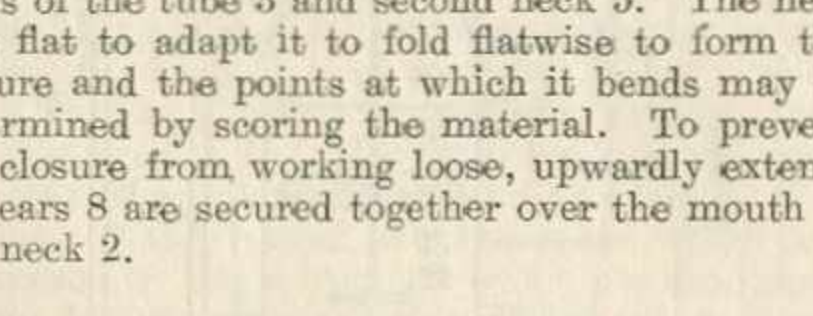
Hot-water bottles are provided with an elongated neck adapted to be folded upon itself to form a tight closure and to be retained in the closed position. To one side of an elongated neck 2 of a water bottle 1 is secured a stiffer tube 3 through which passes an operating member 4 secured at its upper end to a part of the neck 2 above the tube 3. A second neck 5 surrounding the tube 3 and neck 2 is provided with a funnel shaped mouth into which the upper part of the neck 2 is drawn when the operating member 4 is pulled downwards, further movement of the member drawing the neck 2 into the tube 3 where it is held in **Z**-formation with its filling mouth directed upwardly by the tension exerted by the walls of the tube 3 and second neck 5. The neck 2 is flat to adapt it to fold flatwise to form the closure and the points at which it bends may be determined by scoring the material. To prevent the closure from working loose, upwardly extending ears 8 are secured together over the mouth of the neck 2.

FIG.1. FIG.2.



270,290. Compagnie Nationale des Radiateurs. April 29, 1926, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

FIG.1. FIG.3.



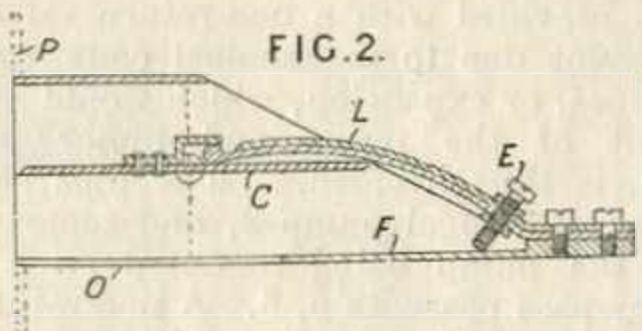
Radiators.—A radiator of cast iron or other metal, sheet metal, pressed, embossed, or otherwise treated, ceramic material or the like, is provided with integral heating conduits 11 and is formed externally to imitate a piece of furniture having doors 6, lock plates 7, and a wide base moulding 9. The radiator projects only slightly from the wall.

270,364. Brown, Sir A. W. June 12, 1926. *Drawings to Specification.*

Heat-storing apparatus; heating systems.—A heat-storing medium for use at temperatures above 300° F. comprises a heavy non-volatile mineral oil or other oily compound. Examples of suitable apparatus for employing this medium are given including an electrically-heated insulated container with an oven or a water-space or both in contact with the heat-storing medium; a stove in which the medium is heated in one part and circulated through a space containing solid heat storage masses and also round an oven; and a set pan with the medium in a directly heated jacket arranged so that when the medium is hot the jacketed pan can be removed and the cooking is completed by the stored heat.

270,521. Woolley, G. O. July 10, 1926.

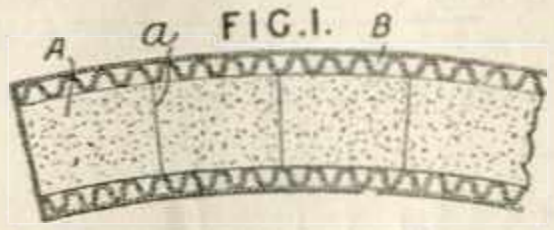
FIG.2.



Thermostats.—A thermostat, readily applicable for regulating the circulation of the cooling fluid of an existing internal-combustion engine, comprises a bimetallic tongue L, one end being fixed to a tubular casing F and the other end, which is preferably of cylindrical form, being a sliding fit between a pivoted valve C and a bracket carried by it. The tongue L is, either fixed so that the valve does not open until a predetermined temperature is reached, or provided with an adjusting screw F. The valve C and the tongue L are so arranged that the tongue acts as a stop for the valve when in the fully open position. To fix the casing in the circulating pipe, the casing is either slit at O or provided with a flange P; alternatively a rubber sleeve may be placed between the casing and the pipe. The metals composing the tongue may be brass and steel.

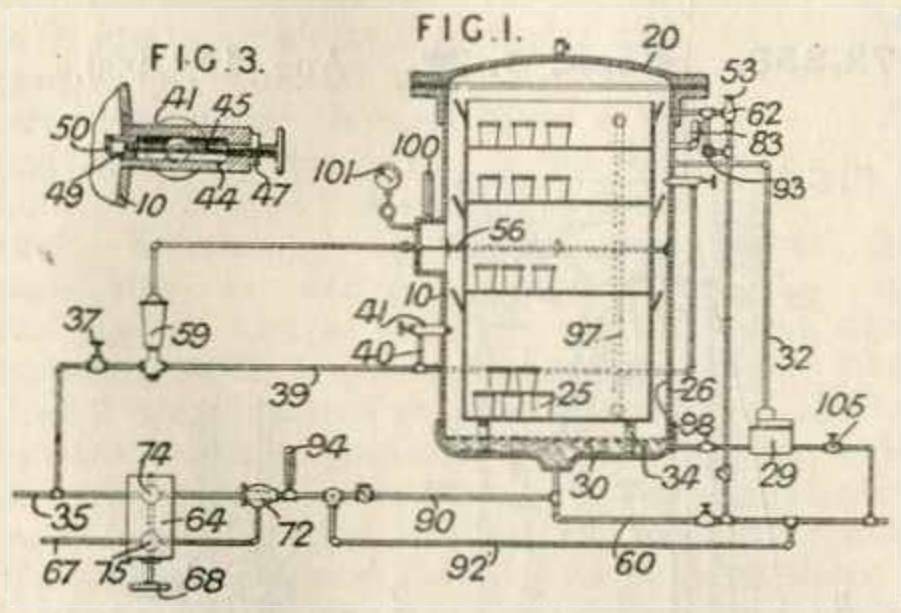
270,589. Grimason, J. S., and **Keasbey-Mattison, Ltd.** Dec. 7, 1926.

FIG. 1.



Non-conducting coverings for heat.—Strips A of compressed magnesia and/or asbestos moulded as flat blocks of rectangular cross sections are machined to the required curvature, and have their long sides *a* milled to the required radius. The strips are then cemented together side by side to form a composite block of the required area, which is covered on both surfaces by asbestos air-cell board B formed of plain and corrugated sheets. One or both ends and one or both sides may be covered by plain asbestos board.

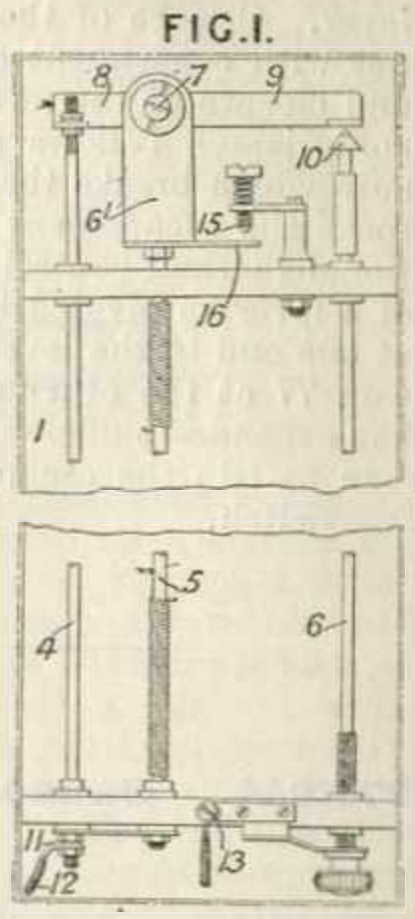
271,052. Anchor Cap & Closure Corporation, (Assignees of *Mullen, G. W.*). May 12, 1926, [*Convention date*].



Heating by circulation of fluids.—To counterbalance the internal pressure produced in sterilizing or cooking food by heating in hermetically sealed containers 25, the containers are inserted in a retort &c. 10 in which air or other gas is entrapped and into which a heating medium containing water vapour, e.g. steam, under pressure, is introduced. In the construction described, the containers 25, which may be exhausted of air, are inserted in perforated baskets 26 resting on a support 34 within the retort 10 to which the cover 20 is then secured by bolts. The retort is heated to the desired temperature by steam applied through tube 35, valve 37, tubes 39, 40 and needle valve 41. The valve 41 comprises a tube 44, Fig. 3, screwed into the retort wall, into which a spindle 45 adjustably screws and is secured by a nut 47. The pointed end of spindle 45 engages a conical seating 49 fitted into tube 44 and having a deflector 50 which directs the steam tangentially into retort 10. A number of these valves may be provided at different positions. The steam is kept saturated by maintaining a constant level of water 30 by means of a steam trap 29 which may have a float-controlled valve which is opened to allow excess to run off when the condensed water reaches a certain high level, and closed at a certain low level. The trap 29 is connected to the retort 10 above the water level by a pipe 32 to prevent air lock. A bye-pass is also provided, enabling the water to be drawn off without entering the trap 29. When the desired temperature is reached, the supply of steam to the retort 10 is decreased or cut off by a valve 59 automatically operated by expansion of gas in a tube 56 within the retort. Pressure is automatically released above a certain value by a valve 62 set by a member 53. A safety-valve 83 set at a higher value than valve 62 is also provided. When sterilization has been completed, cooling water is supplied to the retort through pipes 67, 90. The retort is provided with a thermometer 100 and pressure gauge 101. Specification 108,146, [*Class* 49, Food &c.], is referred to.

271,072. Albert, A. May 15, 1926, [*Convention date*].

FIG. 1.



Thermostats. — An alarm device adapted to operate either on a sudden rise in temperature or at a predetermined temperature, comprises a lever 8, 9 pivoted near one end to a support 6¹ and also pivoted at its short end 8 to a metal rod 4 mounted on a plate 1 of material which is a poor conductor of heat and electricity. The long arm 9 of the lever has at its free end a contact point and a second rod 6 similar to the rod 4 and adjustably mounted on the plate 1 has at its free end a contact 10. The support 6¹ is carried by a rod 5 thicker than the rods 4 and 6 and it has a contact arm 16 adapted to engage a screw 15 in electrical connection with the rod 6. The rods 4 and 5 are in electrical connection, and the rods 4 and 6 have terminals 11, 13 in an electric circuit 12. On a gradual rise in temperature the rods 4, 5, and 6 expand together, and ultimately the plate 16 engages the fixed screw 15, giving an alarm. If the heating is sudden the rods 4, 6 expand more rapidly than the rod 5, causing the lever 8, 9 to tilt about the pivot 7 and closing the circuit at the point 10.

271,525. Electric Heating Co., (Assignees of *Ross, J. D.*). May 24, 1926, [*Convention date*].

FIG. 8.

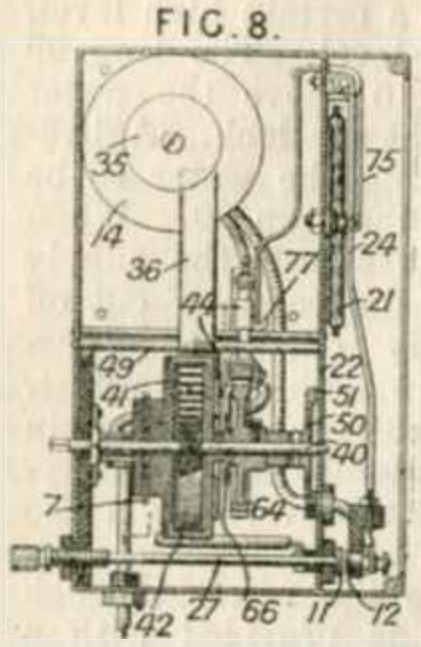
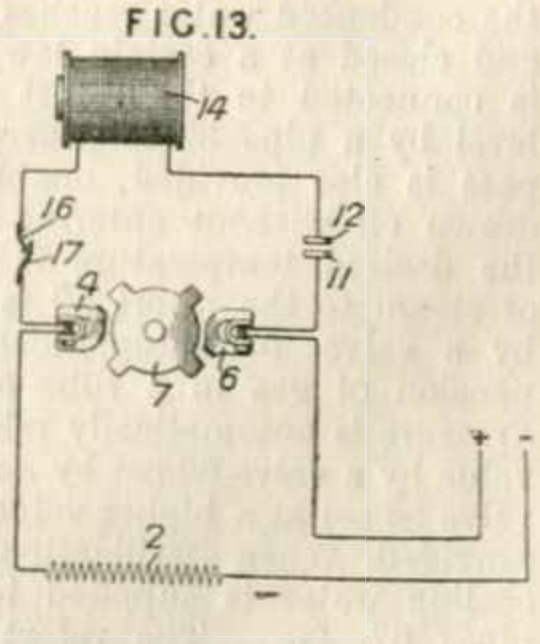


FIG. 13.

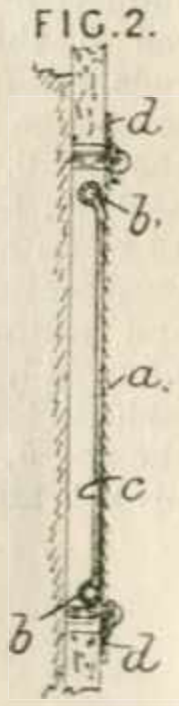


Thermostats.— A switch, which may be fitted to a steam radiator having a heating element 2, is subject to the combined control of a heat sensitive element and an element sensitive to fluid pressure. The heat sensitive member comprises a capsule 21 containing ether and secured to a partition 22. The capsule controls the circuit of an electromagnet 14 the armature of which is connected to the rocking shaft of an escapement lever. Closure of the circuit energizes the magnet with consequent actuation of the escapement and closure of the switch. The pressure element comprises a bellows subject to the steam pressure which breaks the magnet circuit, and finally rocks the escapement to open the switch. Additional thermal control may be obtained by means of a lever 75 pivoted to the partition 22 and fixed at one end to the lever 24 and engaging a pivoted cam 77 at the other end. When the capsule 21 has expanded sufficiently the lever 75 operates the cam to trip the escapement lever and thus open the switch.

271,644. Saunders, S. M. May 25, 1926.

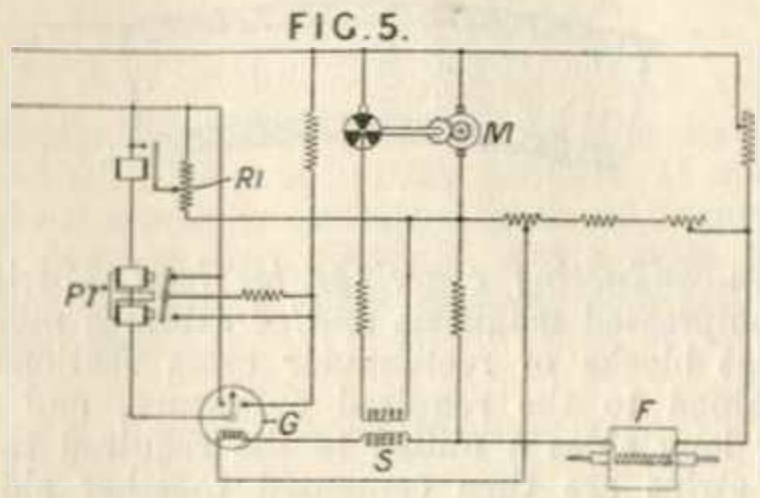
Radiators.— A grid of pipes *c*, *b* conveying hot water, steam or other fluid is welded, brazed or soldered to the rear face of a thin metal sheet *a* in the form of a panel or length of skirting secured to the interior wall surface, as by means of mouldings *d*. The pipes *b* are of larger diameter than the pipes *c* and are coupled between adjacent panels for series flow of the heating medium through a group of panels. According to the Provisional Specification the pipes may be replaced by channels formed of bent or cut lengths of sheet metal, or pipes in halves are opened out, attached to the back of the metal sheet.

FIG. 2.



272,279. Standard Telephones & Cables, Ltd., (*Western Electric Co., Inc.*). March 8, 1926.

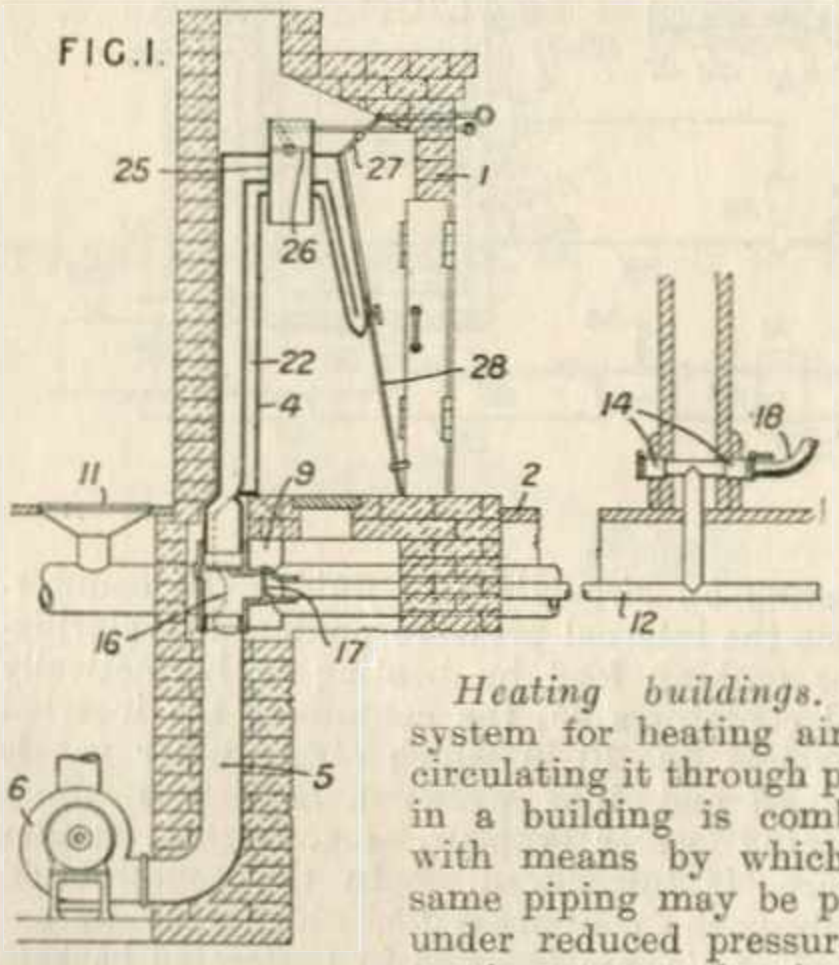
FIG. 5.



Thermostats.— In order to maintain the temperature of an electric furnace F constant, the regulator shown may be employed. The galvanometer G, arranged as in a Wheatstone bridge, has two contacts by means of which a polarized relay Pr is controlled, which in turn controls a relay M regulating the rheostat R^1 by means of which the current through the furnace F is controlled. To prevent sticking of the galvanometer arm, periodic impulses are sent through the galvanometer by means of a rotating switch S.

272,358. Cesa, J. M. Aug. 12, 1926.

FIG. 1.



Heating buildings. — A system for heating air and circulating it through piping in a building is combined with means by which the same piping may be placed under reduced pressure for use in vacuum cleaning. An air-heating chamber 4 is placed at the back of a fireplace 1 and air is admitted through a suction fan 6 and pipe 5. The heated air is delivered through a pipe 9 under the floors 2, and a distributor 11 is provided in each room. The chamber 4 is carried round the top of the fireplace as shown, a flue 25 with damper 26 being provided through it. A central partition 22 causes the circulation of the air through the chamber in contact with the walls. Dampers 27, 28 are also provided, the latter being adapted to shut off the fire

space, so that an electric heater may be placed within it if desired. A gas heater may alternatively be used, in which case the damper 28 is slightly raised. If an ordinary fire is used, the damper 28 is fully raised, and the damper 27 opened. The fan 6 may be reversed, valve 23 closed, and valve 17 opened so that the piping 12 is under reduced pressure. A flexible pipe 18 can be connected to any of the inlets 14 in different rooms for vacuum cleaning purposes.

272,484. Dunham Co., Ltd., C. A., (Assignees of *Jarvis, B. H.*). June 14, 1926, [*Convention date*].

Heating buildings. — In a steam heated radiator system, the condensate from the radiators is delivered by a return main to a tank below the level of a vacuum pump, having a float which controls the pump. Steam passes from a boiler A through pipe B and pressure reducer I to branch pipes C and radiators D. Thermostatic traps F permit the condensate to pass through pipes G to return main H, strainer 16, and tank K. If the pressure difference between the two sides of the system falls below a predetermined point, a vacuum regulato N starts an electric motor 11 and centrifugal vacuum pump 3 which circulates water through pipes 4, 6, and receiving tank 1. A jet exhauster 5 in pipe 6 draws water from tank K through pipe 22 and valve 23, and this is delivered into tank 1. Air and gases escape through pipe 2, and when water in tank 1 reaches a predetermined level, float 9 opens valve 8 and permits some of the circulating water to pass through pipe 7 to the boiler A. The pump 3 stops when the pressure difference in the system reaches the required value. If, during the period that the vacuum regulator N is non-operative, the water level in tank K should reach a predetermined minimum, a float 36 actuates a switch L controlling the automatic starter 13 of the motor 11. The pump 3 is thus normally under the control of either or both regulators N, L. When the predetermined pressure difference is unnecessary, e.g. during the night, the regulator N is disconnected by a switch 15, the pressure in the return main is atmospheric, and the condensate gravities into the tank K while air or gas escapes through relief valve 25. The pump 3 is then controlled only by the level of water in tank K. A check valve 67 is provided to equalize the pressures on the two sides of the system if the source of boiler heating is shut off. The construction of

FIG. 3.

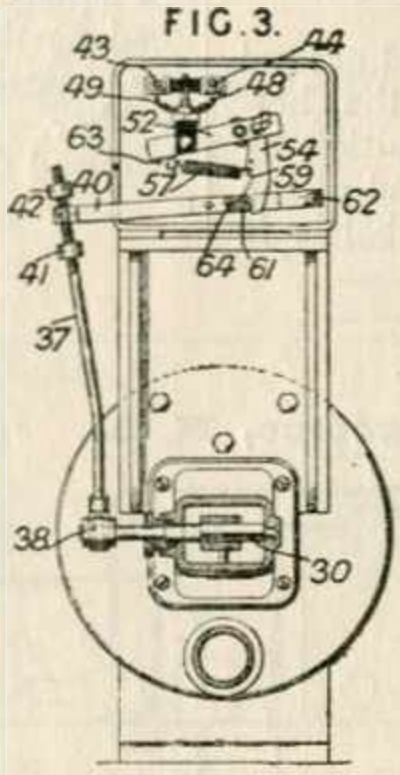
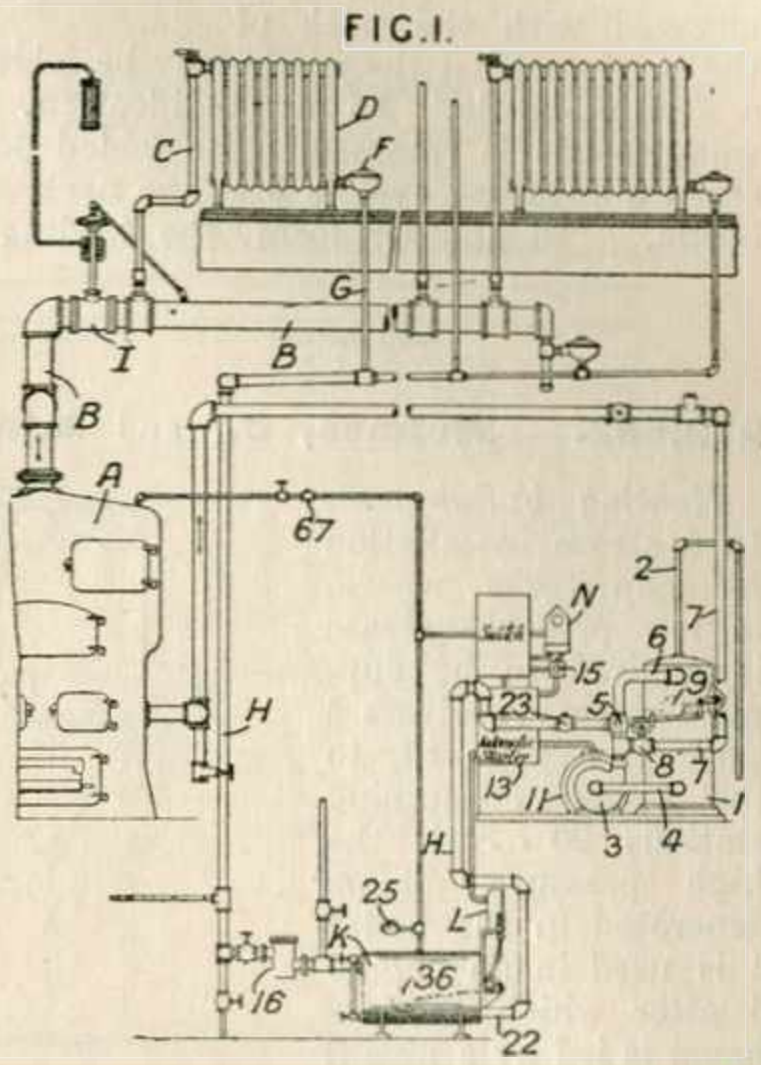


FIG. 1.



the snap-acting switch L is illustrated in Fig. 3. The float 36, Fig. 1 is pivoted on a spindle 30, Fig. 3, which actuates a rod 37 through a crank 38. The rod 37 passes through a lever 40 and carries adjustable stops 41, 42. When the stop 41 lifts the lever 40 pivoted at 62, a roller 61 tends to press the link 54 upwards but is prevented by means of the stop 63 which prevents movement of the lever 52 pivoted at 48. The link 54 thus moves to the right until the roller 61 has passed over the projection 64 on that lever, and the spring 57 then snaps the lever downwards and the left-hand end of lever 52 upwards till the roller 61 rests in the recess 59. This causes the insulated bridge piece 49 to connect the fixed contacts 43, 44 and start the pump 3. When the float 36 falls, the switch is opened with a snap action.

272,592. Brewin, E. March 15, 1926.

FIG.3.

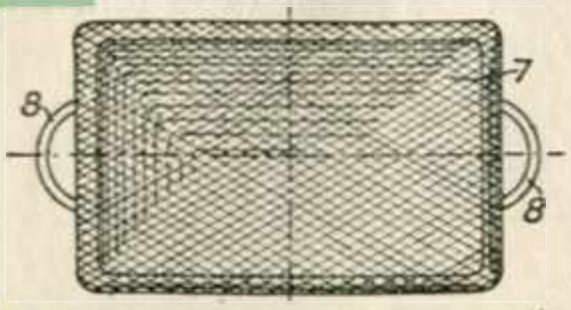
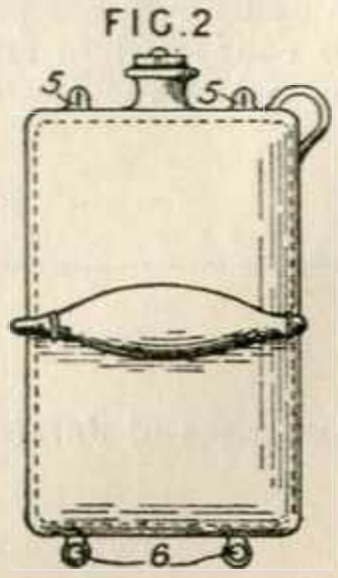


FIG.2



Hot-water bottles. — A flexible hot-water bottle is provided at its base with a loop or loops adapted to be engaged with the neck of the bottle so that the whole may be folded around a feeding-bottle. In a modification, the hot-water bottle is retained in its folded position by studs 6 engaging eyelets 5 at the neck end of the bottle. In another form, the feeding-bottle is held against the folded hot-water bottle by a sheath 7 having loops 8 adapted to be slipped over the neck of the bottle.

272,643. Miller, A. Dec. 28, 1926.

FIG.2.

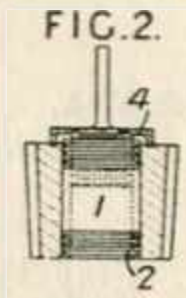
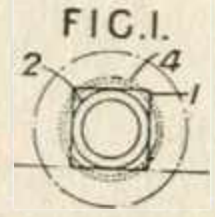
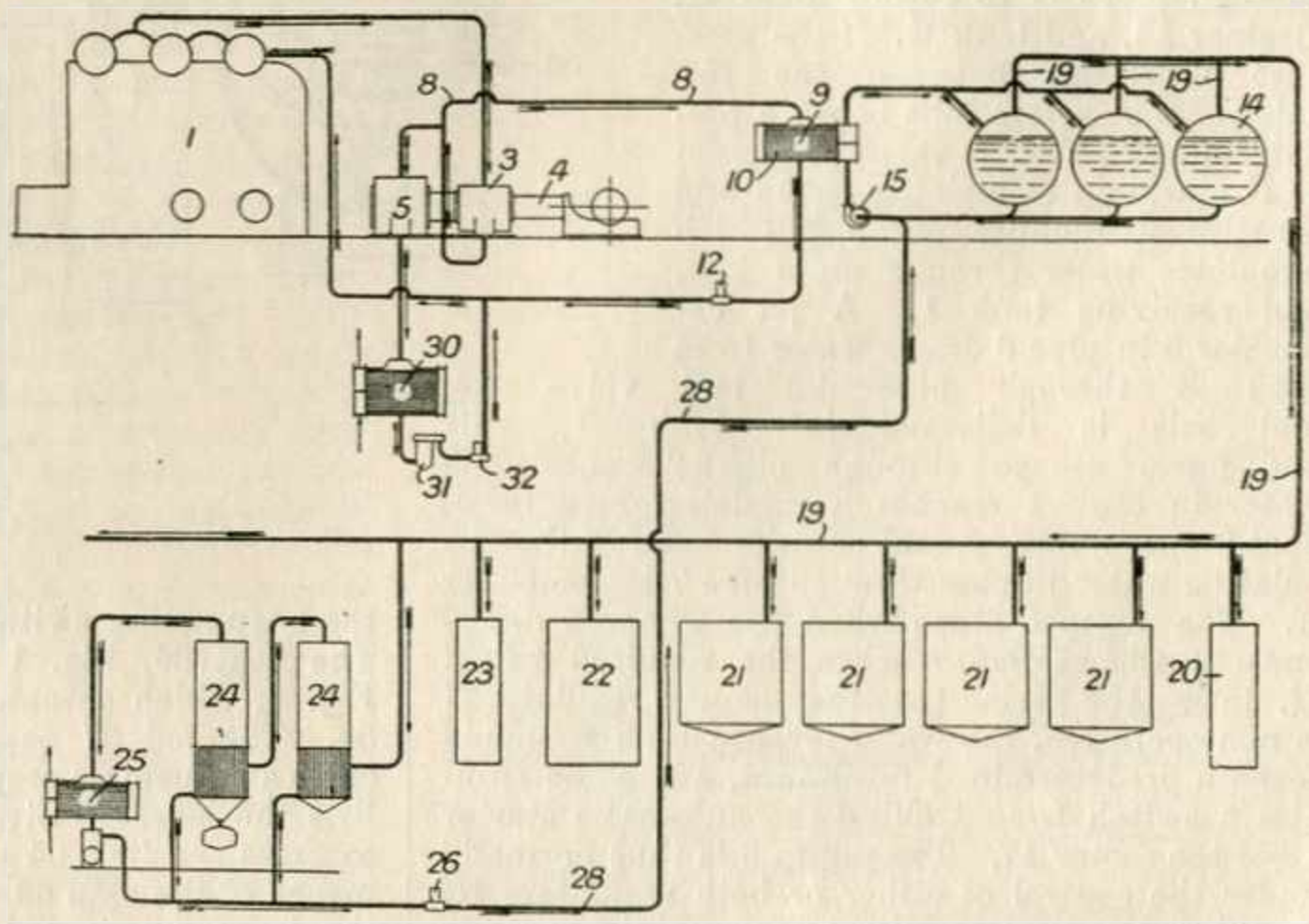


FIG.1.



Hot-water bottles and like heating apparatus.—A stopper-socket for hot-water bottles, water beds, cushions &c., comprises a body 1 of square section, with cylindrical end portions grooved at 2, whereby rotation of the socket in the rubber, when the stopper 4 is screwed down, is avoided.

272,682. Holmes, J., and **Kingcome, H. A.** June 18, 1926.



Heating buildings.— In a steam installation for soap works, wherein low pressure steam is required to be supplied from receivers 4 through a pipe 19, to the various consuming stations 20 - - 24, the high pressure steam generated in the boiler 1 is used in an engine 4 after which the exhaust is led by a pipe 8 to a heat interchanger 9 to maintain the cooling water, which circulates through the tubes 10 thereof and through the receivers 14, at the boiling temperature corresponding to the pressure in the receivers. The cooling water is circulated by a pump 15, and a feed-pump 12 is fitted in series with the condenser 9 and boiler 1. If some of the exhaust steam from the high pressure stage 3 of the engine 4 be fed to the low pressure stage 5, a condenser 30 and air and feed pumps 31, 32 are provided and condensate from condensers 25 in any of the consuming stations 24 is returned to the receivers by a pump 26 through a pipe 28.

272,852. Trane, R. N. June 21, 1926. [*Convention date*].

Radiators.—A heat radiating tube is provided with a number of sheet metal fins having re-bent flanges in contact with the tube to provide reinforcement and good heat contact. A radiator unit embodying such tubes is described. The radiator unit U, shown in sectional plan Fig. 1, comprises a bent tube T carrying a series of radiating fins F between supporting plates P which are flanged at 13 for attachment to the casing plates 18. The plates P confine the flow of air over the fins F, and the radiator is preferably placed within a a cabinet C through which the air flows upwards and is discharged into the room. Each fin F has