11,396. Musgrave, J. L., and **Crittall & Co., R.** May 11.

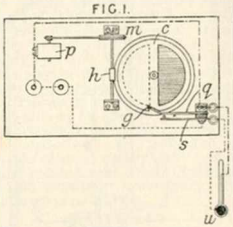
FIG. 2.

Radiators. — Serpentine or other pipes *b* containing circulating heating or cooling media are embedded in the walls &c. of a building. The backing *a* is of non-conducting material, but the actual covering *d* of the pipes is of a better heat-conducting material.

11,548. Schneider, F. June 9, 1910, [*Convention date*]. *No Patent granted* (*Sealing fee not paid*).

Thermostats.—A contact thermometer *u*, controlling an electro-motor *p* operating a flat disk valve *c* to allow the escape of warm air from a space or room is short-circuited by two spring contacts *q*, *s*, which are closed by the valve immediately it begins to move, so as to avoid the formation of a spark in the thermometer. After a complete turn of the valve, during which it has been opened and closed again, a notch *g* on the rim of the valve engages

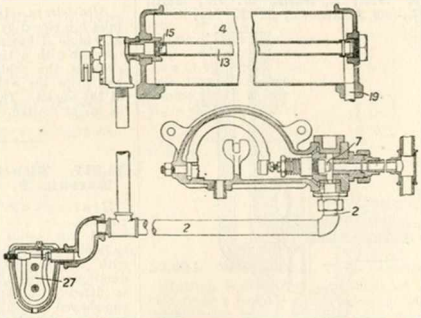
FIG. 1.



with one of the contacts, and if the thermometer circuit is open, the valve will remain closed, but, if the temperature is still excessive, the valve will continue to open and close. The valve is driven by the motor through a pulley *m* and a worm *h*.

11,618. Barty, T. May 13.

Heating buildings; thermostats; steam-traps.—The supply of steam to a number of radiators 4 on a distributing pipe 2 is controlled by a thermostatic valve 7, in proportion to the amount of steam required by the radiators. The admission of steam to each radiator is controlled by a separate thermostatic device 13, 15 so that the pressure in the radiator is always atmospheric. The radiators are open to the atmosphere as at 19. A steam-trap 27 is provided.



12,047. Darwin, H., Mason, C. C., and **Cambridge Scientific Instrument Co.** May 18.

Thermostats.—In apparatus for controlling the temperature of a mixture of fluids such as hot and cold air for a hot blast, by controlling the rate of supply of one fluid or the heat given to one fluid or to the mixture by means of a thermostat, with a motor-operated valve or switch, means are provided for cutting out the thermostat and an intermittent regulator by hand to allow the valve to be opened or the switch operated more rapidly for a predetermined time, after which the thermostat again comes into action. As shown for controlling a valve, a resistance thermometer, a thermo-couple or a compound strip affected by temperature is connected in circuit with a battery and a galvanometer coil C having a contact arm C^1,

which is pressed down intermittently on a bar D, by means of an arm E which is rocked by an electro-magnet E^5, the circuit of which is made and broken by a contact-device K^3 driven continuously by clockwork. A screw is provided to vary the period of contact at K^3. The bar D

FIG.1.

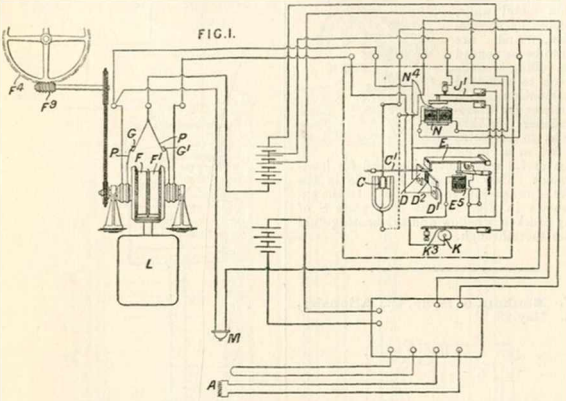
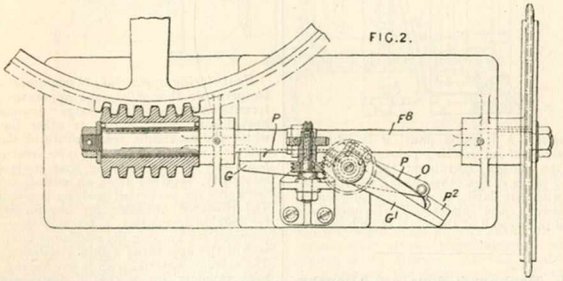
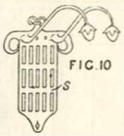


FIG.2.



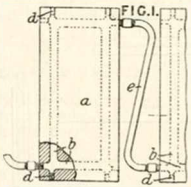
has an insulating piece D^2 separating two conducting pieces D, D^1, which are connected with the magnets F, F^1 of a reversing clutch, to put a constantly running motor L in gear with mechanism to open or close a cold air valve F^4 through a worm F^3. In order to deal with a large temperature change, such as that produced when the stove supplying the hot air is changed, a hand regulator is provided. This consists of a push-button M which closes the circuit of the clutch F to open the cold air valve, and also closes the circuit of an electro-magnet N which opens a spring contact J^1, thereby cutting out the intermittent regulator and thermostat, and at the same time a contact N^4 is closed, so that the circuit of the magnet remains closed when the push button is released. After the valve has been opened a predetermined time, an arm O, Fig. 2, carried by a sleeve driven from the shaft F^8 by worm gears, engages with a spring contact P so as to break circuit with a contact P^2 to open the circuit of the clutch. Two such contacts P^2 are mounted on arms G, G^1, which are adjustably secured on a pin carrying the rocking arm O. When the clutch circuit is opened, the magnet N is de-energized and the thermostat brought into circuit again. When the apparatus is used to control electric heaters for heating one of the fluids, the valve is replaced by a multiple contact switch. Any means for obtaining two speeds of operation may be used instead of the intermittent and continuous actions described; a reversing electric motor may be used or the electric motor replaced by a piston worked by pneumatic or hydraulic pressure.

12,159. Consigliere, S. May 20, 1910, [*Convention date*].



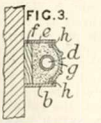
Radiators are made with thin metal walls, for example by electro-deposition, and are adapted to be suspended from the ceiling or walls of the room to be heated in combination with other articles for example chandeliers; or they are made to serve as shelves &c. so as to be otherwise useful when not being used for heating-purposes. They may also be made in the character of ornaments to the room. In the example shown in Fig. 10, the back plate S of the lamp bracket is hollow and the heating-fluid circulates therethrough.

12,777. Benham & Sons, and **Allensby, C. R.** May 26.



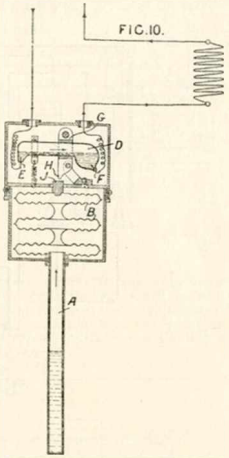
Radiators.—A metallic panel *a* is provided with a series of intersecting passages *b* extending to the margin, certain of the ends being closed by plugs *d*, the others being used in connexion with circulating-pipes *e* for communication between the plates. The panels are mounted in the wall of the room to be heated or cooled.

12,778. Benham & Sons, and **Allensby, C. R.** May 26.



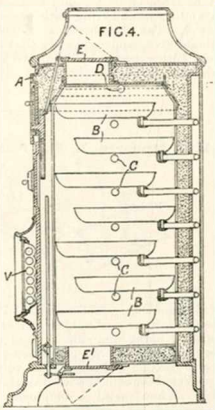
Radiators. — At the back of a hollow casing or moulding *b* forming part of the decoration of a room, a sheet of non-conducting material *f* is placed, and the remainder of the space is filled in with a good heat - conducting material *e* packed round a pipe *d* conveying the heating or cooling medium. A cover *g* which may be at the top or side is affixed by screws *h* or other means.

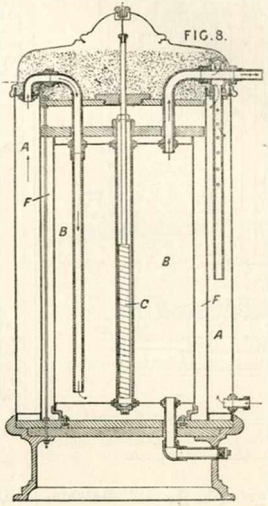
13,334. Harrison, A. F., and **Peard, O. L.** June 2.



Heat-storing apparatus; thermostats.—A low-temperature thermal-storage apparatus for intermittently furnishing large quantities of heated air, gases, water, or other liquids in which the maximum temperature of the reservoir does not exceed 300° F. is so arranged that heat energy, for example that derived from electricity, received from an outside source at low rates for prolonged periods, is accumulated and rendered available for use in large and regulatable quantities, automatic means being provided for keeping the maximum temperature within the apparatus within the desired limits. The storage material used is one having a large heat capacity for a rise of temperature not greatly exceeding the temperature at which heat is required from the apparatus, for example, acetate of soda, suitable water solutions, or water alone. The means for regulating the use of the apparatus consist of dampers or valves controlling the passage through the apparatus of the medium to be heated. The automatic means for regulating the temperature comprise thermostats which may operate either valves or switches controlling the supply of energy, or the dampers &c. allowing the heating effect to operate in part, and thus increase the radiation losses. The whole apparatus is normally heat-insulated, and this insulation may be so proportioned that the heat losses through radiation on reaching a predetermined temperature are sufficient to prevent a further rise.

In this case, no thermostatic device is necessary. Fig. 4 shows a radiator adapted for heating rooms. Within an insulated casing A, heat-storage vessels B are arranged, the electric or other heating-means being shown at C. When fully heated, the radiator is brought into use by opening the dampers E, E^1, thus allowing a stream of air to pass through the apparatus.





In the example shown, provision is made at V for the use of luminous heat radiating means in addition. The regulating-thermostat, the tube of which is inserted at D, either operates the switch or causes the dampers to open slightly when the maximum temperature is attained. Fig. 8 shows the application of the invention to a water-heater, the water itself being used as the storage medium. The tank A surrounds the tank B, which is directly heated by a heater C. An air space F serves as a partial insulation. The tank capacities are so proportioned that when the water in the water-chamber has attained a certain temperature, the radiation losses from the external chamber will equal and balance the heat supplied. Or, the outer tank may be jacketed and thermostats used. Fig. 10 shows one example of a thermostat which may be employed. The tube A which is subjected to the heating contains a liquid whose vapour pressure is less than atmospheric at the temperature at which the switch is to operate. At this predetermined temperature, the diaphragms B are expanded, and the stud J pressing on the heel H of the lever G tilts it and the tube D which it carries, causing mercury to flow into the enlargement at one end, breaking the circuit between the electrodes E, F. In another device, a relay operates an electro-magnet which tilts the tube D; and in others diaphragms operate quick make-and-break switches through suitable link-work.

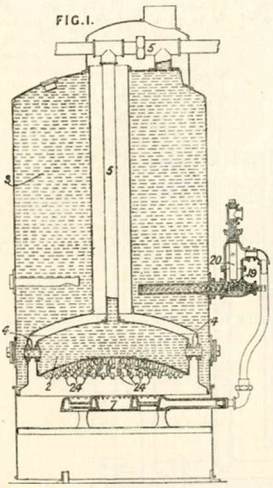
13,347. Roxburgh, A. B., and **Scott, J. E.** June 3.

Thermostats.—In a geyser, the passage of gas to the burner 7 is controlled according to the temperature of the water by the obstruction of the gas passage 20 by the expansion of mercury 19.

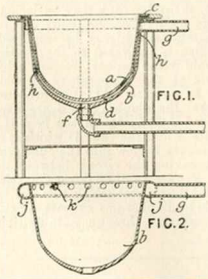
(*For Figure see next page.*)

13,347.

FIG. 1.



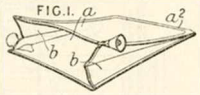
13,391. Bynoe, F. O., and **Balchin, Schulz, & Co.** June 3.



Heating-apparatus.—Jacketed vessels heated by low-pressure highly superheated steam and adapted for use in heating, boiling, melting, evaporating, or distilling comprise two similar pans *a*, *b* joined at their rims *c* so as to form a steam chamber *d* round the inner pan. Superheated steam is admitted at the bottom by a nozzle *f* and is exhausted through a pipe *g*. To ensure an even distribution of steam, the chamber *d* is divided by a baffle *h*, which may be perforated, crimped, or serrated. The baffle may be replaced by a pipe *j* encircling the outer pan and communicating with the chamber *d* by inlets *k*. The chamber *d* is of constant cross-sectional area, approximately that of the supply pipe. Either pan may be fluted so as to give a whirling motion to the steam.

13,416. Roberts, L. G. June 3.

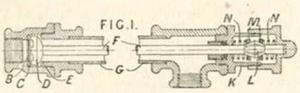
FIG. 1.



Hot-water bags; foot warmers.—Two or more water-containers *a* of rubber or metal are joined or hinged along one side a^2, and the sides adjacent to the joint are connected by triangular pieces *b* flexible or hinged so as to form a space or pocket between the containers of variable width. When metal is employed, means may be provided for securing the containers at a set distance apart.

13,458. Cleland, J., and **Stewart, J. C.** June 6.

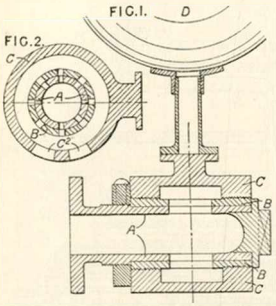
FIG. 1.



Steam-traps.—In a trap of the expansion type, the valve-spindle is held frictionally, and the extent of the valve opening is limited by a stop, the trap by this means adjusting itself when the steam pressure changes. In the trap shown in Fig. 1, the valve D is placed at the inlet of an expanding tube G having at the other end an extension K in which the valve-spindle F is held by a tapered sleeve L, split into segments which are pressed against the spindle by rings M and springs N. If the steam pressure rises, the increased expansion of the tube G first brings the valve D against its seat E, and then moves the grip L along the spindle F. If the steam-pressure falls, the grip L is moved in the reverse direction by engagement of projections on the valve with a stop C. A strainer B is placed at the inlet of the

trap to prevent entrance of grit. In a modification, the valve is placed at the outlet end of the trap, and the casing containing the gripping-sleeve is movable by a pair of levers pivoted to arms on the expansive tube, and to two stay-rods.

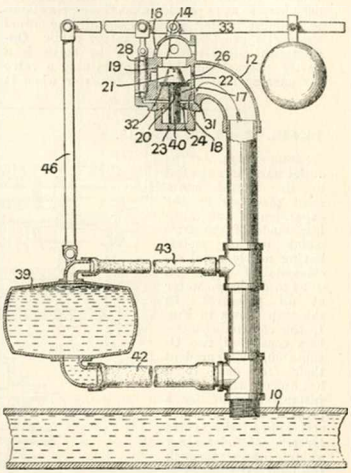
13,463. Hough, S. June 6.



Steam-traps.—A float-valve consists of a fixed ported plug A enclosed in a rotary casing C actuated by a float D. The casing, as shown in end sectional elevation in Fig. 2, consists of two parts C, B rigidly secured together, the part B having ports corresponding to the ports in the plug A, and the part C having outlets C^2.

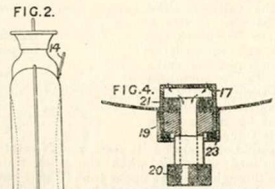
13,494. Brower, J. D. June 6.

Heating buildings &c.—A valve device for permitting the escape of air from water mains without the escape of water comprises a branch pipe 12 on the main 10 provided with an air vent 14 controlled by a piston-actuated lift valve 22, and protected by a perforated hood 16. The lift-valve face 32 is secured to the piston 17 which works in a cylinder 18 by a screwed pin 20 provided with a tapered head 21 adapted to take in the aperture 14 in the valve-seat 19, and with an extension 40 adapted to work in a guide-aperture 24 in a chamber 23. A small aperture 26 connects the branch pipe to the outlet and a passage 31 controlled by an auxiliary lift valve 28 supplies air to the underside of the piston. The auxiliary valve and consequently the main valve is held open when there is no water in the main by an adjustably-weighted lever 33. The valves are closed when the water reaches the branch pipe by the weight of water in a container 39, which is coupled to the lever 33 by a link 46, the water entering through a



flexible connexion 42 and driving air out through a similar connexion 43.

14,145. Gillette, L. F. June 17, 1910, [*Convention date*].

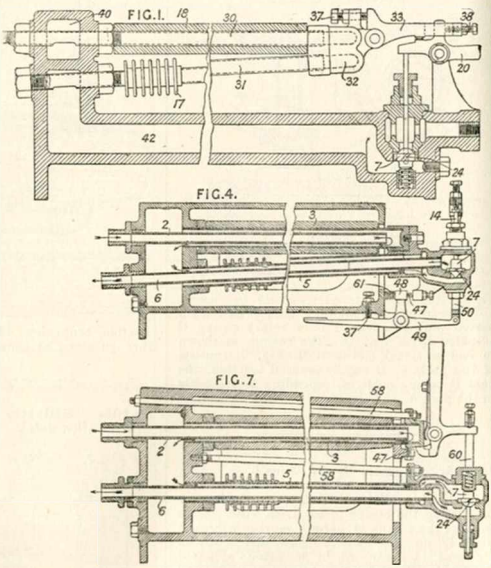


Hot-water bottles.—Consists of a particular form of hot-water bottle of the kind which is also adapted for use as the reservoir of a fountain syringe. The reservoir comprises two

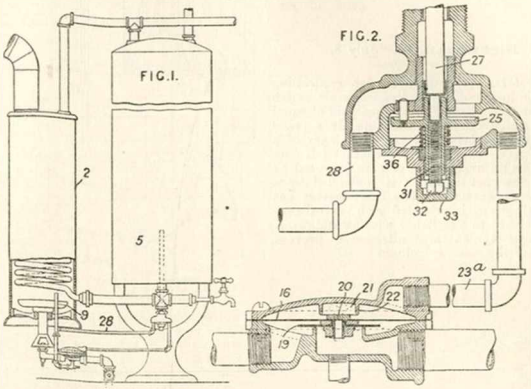
circular dished metallic plates 7 joined at their edges, each plate having the exterior surface concave at the centre and convex near the periphery so as to provide a maximum resistance to collapse under rough usage. The usual stopper is provided with a safety chain. Opposite the stoppered neck of the bottle is a partly internal chamber 15 containing a valve for opening and closing the reservoir when it is suspended by a ring 14 and connected with a syringe (not shown). The valve consists of a screwed hollow plunger 19 adapted to be operated by an external head 20 so as to open and close perforations 17 in the chamber 15. Plunger packing 21, and packing 23 secured between the chamber and end cap, prevent undesirable leakage of the liquid both in the open and closed positions of the valve.

14,442. Reid, T. June 19.

Steam - traps. — The outlet valve is controlled by the lateral movement produced by the expansion of two members made of the same metal or of metals having nearly equal coefficients of expansion so as to discharge water at all pressures. In the trap shown in Fig. 1, the controlling-members consist of two U-tubes 30, 31 secured at their free ends to a head-piece with an adjustable stop 37 for a pivoted arm 33 which acts upon the valve lever. Condensation water passes through the upper U-tube 30 to a chamber 40, from which it passes through the lower U-tubes 31 to a reservoir 42. When sufficient water has collected in the lower U-tube, the latter contracts and depresses the arm 33, thus opening the valve 7. The arm 33 also carries a set-screw 38, which engages the valve-lever and operates the valve when the temperature falls say to 212° F. The valve may also be opened by means of a handle 20 or a foot-lever; it is mounted freely on its stem, and is rotated by inclined vanes 24 when steam or water passes through it. The upper tube 30 may have an insulating-covering 18 and the lower tube 31 radiating-fins 17. In the trap shown in Fig. 4, the controlling-members consist of tubes 3, 5, and water enters and leaves by inner concentric tubes 2, 6, the valve being placed between the inner and outer of the lower tubes 5, 6. The valve chamber is secured to the tubes 3, 5 and the valve 7 is connected by a valve-rod 14 to a curved link 50 connected to a lever 49 which is urged by a spring 61 against an adjustable stop 37. The valve is opened at low pressures by the abutment of a set-screw 47 against an arm 48 on the lever 49. In a modification, the valve opens against the steam pressure. In the trap shown in Fig. 7, the outer of each pair of concentric tubes is secured to a tie-rod 58 of metal having a low coefficient of expansion, the valve-chamber being attached to the lower member and the valve connected to a curved link 60 controlled by the upper member. At low pressures, the tube 3 engages a set-screw 47, which prevents further depression of the valve. In a modification, the valve opens in the same direction as the steam-pressure. Specification 22,593/11 is referred to.



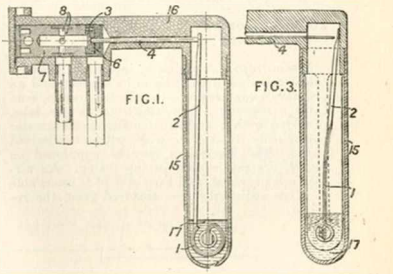
15,202. Robertshaw, F. W. June 29.



Thermostats.—A water-heater of the gas-fired type, having a heater 2, Fig. 1, and a separate storage reservoir 5, is provided with valve apparatus for automatically controlling the gas supply for maintaining a constant predetermined temperature of the water. The supply of gas is controlled by a valve 19, Fig. 2, carried by a diaphragm 16 having an escape opening 20 leading into a chamber 21, from which gas passes through a pipe 23^a to an auxiliary valve 25, operated by a thermal bar 27 in the storage reservoir. When the water is below the required temperature, the thermostat opens the auxiliary valve 25 and relieves the accumulated gas above the diaphragm 16, whereupon the main valve 19 is opened by the incoming gas which is thereby supplied to the burner. The gas above the diaphragm is discharged through the auxiliary valve 25 and a pipe 28 into the pilot burner tube 9, Fig. 1. When the main valve is open the chamber 21 is closed by the diaphragm with the exception of a small escape opening 22 of less area than the opening 20. The auxiliary valve 25 has an adjusting-screw 31, which is held up against the thermal bar 27 by a spring 36, and has a head 32 adapted to receive an adjusting-key. The head 32 is enclosed in a removable screw cap 33. The adjusting-key carries a finger co-operating with temperature marks on the casing, so that the operator may set the apparatus to give any predetermined maximum temperature.

15,821. Théobald, A. July 7.

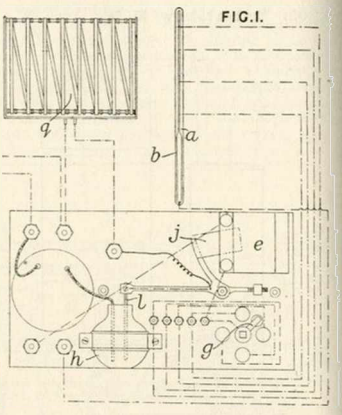
Thermostats.—A bimetallic strip directly operating a gas-valve, is wholly or partly surrounded by a mass of very fusible metal contained in a casing, which is placed in a pot containing molten metal such as type metal, the temperature of which is to be controlled. In the arrangement shown in Fig. 1, a curled strip 1 is wholly surrounded by fusible metal 17 in a casing 15, and operates a valve 3 through an arm 2 and a rod 4. In the arrangement shown in Fig. 3, a straight strip 1 is heated by a small quantity of fusible metal 17, and by radiation from the casing 15, and operates the valve through an arm 2 and a glass rod 4. The valve seat is formed on a hollow plug 7, Fig. 1, which is screwed into a casing 16, and has holes 8 to allow the passage of gas. A washer 6 holds the valve in place.



15,898. Nightingall, V. July 8.

Thermostats.—In apparatus for controlling an electric heater *q*, an electro-magnetic switch has a contact consisting of an amalgam of equal parts of mercury and tin contained in a vessel *h*, the amalgam being covered by a layer of a heavy mineral oil. The other contact *l* is connected with an armature *j* or core operated by an electro-magnet *e*, which is controlled by a contact thermometer *a*. The thermometer has a long bulb *b* and is provided with several contacts connected to a switch *g* with an indicator. The thermometer contains nitrogen to prevent breakage of the mercury column.

FIG. I.



15,899. Nightingall, V. July 8.

Thermostats.—A contact thermometer 13, Fig. 11, provided with several contacts and a selecting-switch 13^d, controls a mercury-break electro-magnetic switch 15. The thermometer may be in circuit with a battery, or in the secondary circuit of a transformer 27, or a tapping may be taken off a coil connected across the mains. The electromagnetic switch has an armature 16, Fig. 8, carrying an indicator 22 and a plunger 17 dipping into mercury. A thermometer for checking the working of the thermostat may be provided.

FIG. 8.

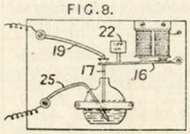
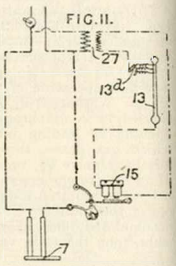
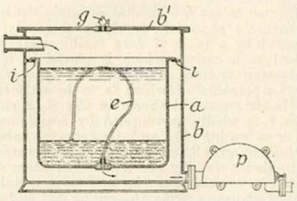


FIG. 11.



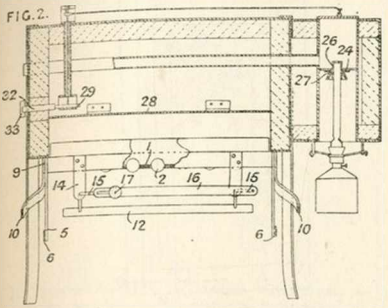
16,853. Lombard, J. July 26, 1910, [*Convention date*].

Steam-traps.—A casing *b*, interposed between the steam-pipe or the like to be drained and an ordinary expansion or other steam-trap *p*, contains a receiver *a* into which the water falls, provided with a siphon *e* to deliver the water periodically to the trap *p* without admixed steam. The receiver *a* may be supported on lugs *i*, or may be cast in the casing. An air-cock *q* is provided, and the cover b^1 is removable to allow sediment to be removed from the receiver.



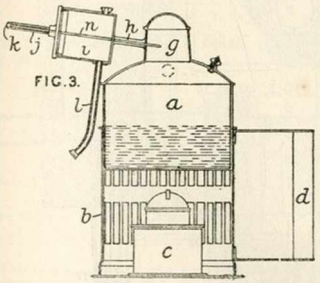
17,160. Fischer, J. July 26.

FIG. 2.



Thermostats.—To regulate the temperature of an incubator from the exterior as well as from the interior of the apparatus, a copper bar 32 is secured to the capsule 29, passes through a wadded aperture in the incubator wall, and is provided on its outer end with metal flanges 33.

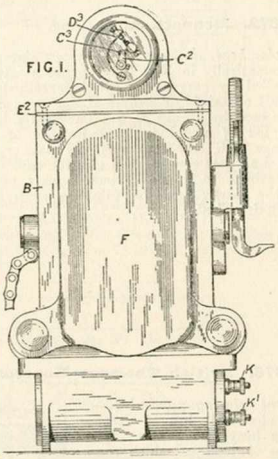
17,499. Cole, A. G. Whitehorne-. Aug. 1.



Steam-traps.—An apparatus for treating the skin with steam comprises a boiler *a* carrying a dome and steam-pipe *n*, which is situated within a nozzle *k* connected with an upwardly tilted receptacle *i* for trapping water of condensation.

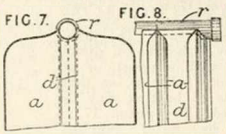
17,810. Welch, W. H., and **Frost & Co., H.** Aug. 4.

Thermostats.—In an electrically-heated vulcanizer having cavities containing water or steam to distribute the heat, the current is controlled by a thermostat actuated by the pressure of the fluid or otherwise. In the vulcanizer

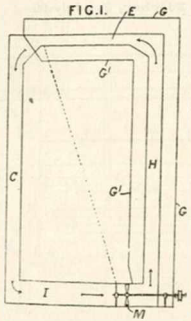


shown in Fig. 1, the passages containing the fluid are connected to a pressure-gauge, the spindle of which carries an arm C^2 having an insulating-button C^3 actuating a spring contact D^3 in the heating-circuit.

18,272. Steffen, H. Aug. 12.



Radiators are made in two similar halves folded or pressed out of sheet metal, with the heating-ribs *a* and longitudinal walls *d* formed alternately. The ribs are drawn together at their top and bottom ends, and are fastened by welding, soldering, or folding. The top and bottom edges of the walls *d* are similarly fastened, or they may enclose the supply or return pipe *r*, or be welded or otherwise attached to it as shown in the Figures. The radiators may be in any form.

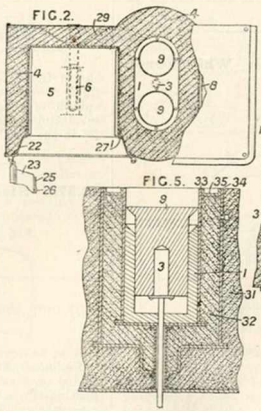


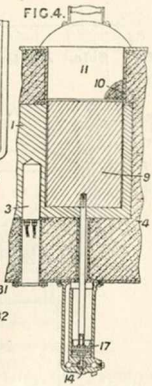
18,672. Bennett, A. R. Aug. 18.

Solar heat, utilizing.—The system shown diagrammatically in Fig. 1, comprises a motor M impelled by currents of fluid contained in a circuit containing a heater H and condenser C connected by trunks E, I. The heater is constructed of metal enclosed by one or more casings G, G^1 wholly or partly of glass or mica. The condenser consists of a glass or mica casing or casings. A vapour-generator may be used in the heater, one of tubulous construction being described.

18,676. British Thomson-Houston Co., [*General Electric Co.*]. Aug. 18.

Heat-storing apparatus.—An electrically-heated stove has a heat-storing mass, the whole or part of which can be moved within or through a heat-insulating enclosure to enable the heat to be transferred to a cooking or other vessel. In the arrangement shown in Figs. 2 and 4, a block of iron 1 placed between two ovens 5, 8 is provided with an electric heater 3, and contains two iron plungers 9, which can be raised by means of pistons 17 to lift a heat-insulating cover 11 and expose the surface. The plunger may either be in direct contact with a vessel, or at a distance below it, so that the rate of heating may be regulated. The piston 17 is raised by water supplied through a cock 14, and lowered by connecting the cock with an exhaust pipe. The thickness of insulating-material between the block 1 and the ovens is reduced, so that heat passes to the ovens.

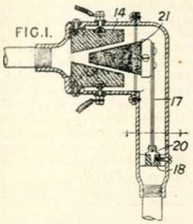




In the arrangement shown in Fig. 5, a single plunger 9 is used, which is provided with a heater and is surrounded by a block of iron 1. The relative sizes of the parts 1, 9 may be varied.

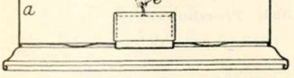
Non-conducting coverings.—The block 1, Fig. 5, is surrounded by a double jacket having walls 33, 34, 35, containing lamp-black or silica 32, the seams being brazed, and the space exhausted of air. The outer wall 34 is surrounded by heat-insulating material 31 such as lamp-black, silica or infusorial earth. The lining of the opening 10, Fig. 4, through which the block 9 is moved, and the walls 33, 34, 35, Fig. 5, are made of metal of low thermal conductivity, such as that described in Specification 26,940/07, [*Class* 82, Metals and alloys]. Specifications 3289/05 and 22,598/08 are also referred to.

19,108. British Thomson-Houston Co., [*General Electric Co.*]. Aug. 25.



Thermostats.—In an electric water-heater a device sensitive to temperature is provided to vary the flow of water from the heater, while maintaining the temperature constant. The heating may be effected by passage of current through the water between two electrodes 14. A conducting-block 21 is carried by a bimetallic strip 17 and arranged to vary the passage area between the electrodes. The bimetallic strip consists of strips of iron and brass carried by a clamp 20 secured to a spider 18 of insulating-material. In a modification, the bimetallic strip carries one electrode.

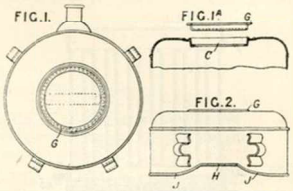
19,131. Fromme, R., [*Arndt, Geb.*]. Aug. 25.



Foot-warmers.—In a foot-warmer heated by a candle *e* or the like, and made of a box *a* and cover *c*, a dished plate *l* is attached to the top plate *i* to protect its lower surface from the direct impact of the hot gases and to form a heat-insulating air space *m*.

19,770. Machin, T., Joy, T. H., and **Freeman, D. W.** Sept. 5.

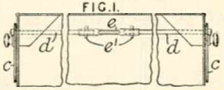
Hot-water bottles &c.—A hot-water bottle or the like has a large opening C in one side for cleaning purposes. The opening is covered with a lid G wedged into the conical opening C. The side of the bottle which comes against the body



has inwardly curved marginal positions J connected by a flat portion H.

Reference has been directed by the Comptroller to Specification 71/81, [*Class* 125, Stoppering &c.].

20,172. Berry, A. F. Sept. 11.



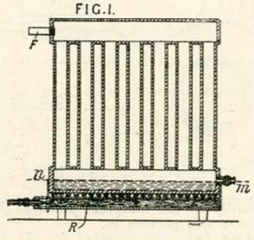
Thermostats.—Doors to allow the escape of hot air from an oven are released by the melting of a fusible plug if the temperature becomes excessive. In the arrangement shown in Fig. 1 two doors *c* are secured in balanced relation by rods *d* and a fusible plug *e*, so that, when the plug melts, the doors uncover ports. The doors may be opened by hand and may be made of transparent material such as mica to allow inspection; or separate windows may be provided. The plug may be in the shape of a cross in section, and may be secured by cotters e^1, or by screwing, or by sleeves which may be slotted to receive the plug. In another arrangement, one or more doors are held closed by fusible catches or holders.

20,241. Frank, H. Dec. 6, 1910, [*Convention date*].

Radiators; special circulating-media.—The surface temperature of radiators is prevented from exceeding 70° C. by employing as the heating-fluid the vapour of a chlorine-carbon compound or like liquid boiling at about 70° C. at normal pressure. The radiator is worked at ordinary pressure, or only slightly above or below it. In Fig. 1, a radiator is shown as containing the liquid to the level *m*, *n* and fitted externally with a gas-burner R. A pipe F vents the inside of the radiator to the atmosphere. The chlorine-carbon compounds

specified are carbon tetrachloride $C Cl_4$, dichlorethylene, and trichlorethylene.

FIG. 1.



20,807. Soc. Française de Chaleur et Lumière. Jan. 20, [*Convention date*].

FIG. 1.

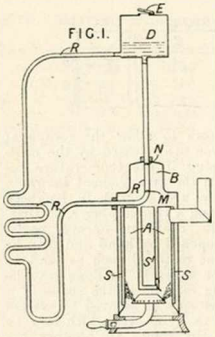
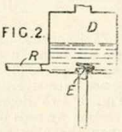


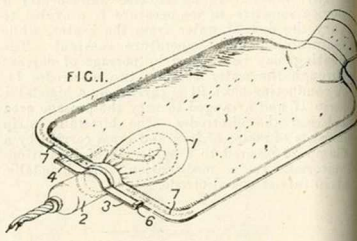
FIG. 2.



Heating by circulation of fluids.—Relates to a method of promoting circulation in hot-water heating-systems. According to the present invention, alternate accelerations and retardations in the flow of water are caused to recur with increasing frequency so that a continuous emulsion of water and steam is produced in the system, the circulation being promoted by reason of the vacuum created in the expansion tank by the condensation of the steam. Fig. 1 shows the apparatus employed. The boiler A, cylindrical in shape, is provided with an extension B and is fitted with open-ended tubes S, S^1 to facilitate the circulation of the water. The return pipe R of the heating-system enters the upper part of the boiler, traverses the extension B, and then passes upwards to the expansion tank D. Within the extension B, the pipe R is formed with lower and upper ports M, N. The tank D is provided with an air-escape valve E. In operation, steam generated in the boiler is at first condensed by the cold water returning through the pipe R and port M. As the temperature rises, steam passes into the pipe R through the port N and thence into the tank D, where it is condensed, thus creating an increased flow in the pipe R. This increased flow condenses steam in the extension B, a smaller quantity of steam then escaping into pipe R. The action is then repeated, the intermittent accelerations and retardations recurring more frequently until, eventually, a continuous emulsion of water and steam is produced in the system. The valve E may be fitted on the end of the pipe R as shown in Fig. 2.

20,889. Lamb, D. P. Sept. 21, 1910, [*Convention date*].

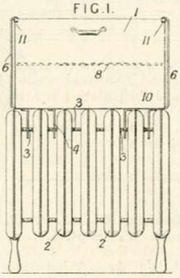
FIG. 1.



Hot-water bottles.—A chamber 1 is provided for the reception of an electric-lamp bulb and socket 2, which is clamped in position by two arms 3, 4 pivoted at one end and held by a catch 6 at the other. One arm 3 is permanently fixed to the bottle, for example by wires 7 embedded in the seam.

21,353. Pfarrhofer, J. Sept. 27.

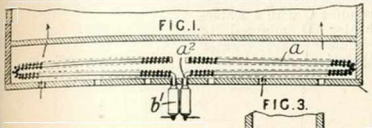
FIG. 1.

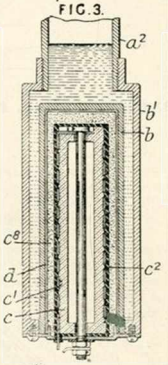


Heating-apparatus; radiators.—An oven 1

for warming plates and food adapted to rest on the connexions 3 between the elements 2 of a hot-water or steam radiator, to be warmed thereby. A drop door 10 has rings 11 at its upper corners which engage and slide on side rods 6. The oven is fitted internally with a perforated shelf 8.

21,699. Gold, E. E. Oct. 2.





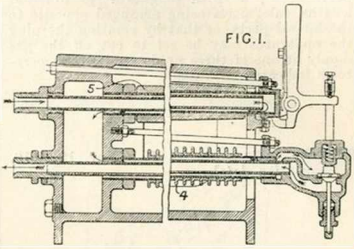
Heating buildings and vehicles. — For heating buildings, vehicles, &c. on a non-circulating system, radiating-pipes a containing a quantity of vaporizable liquid are employed, an electric heater being fitted in an enlargement b^1 of a depending portion a^2. The heater comprises an insulating porcelain core c with electrical heating-wires c^1, the whole being coated with enamel c^2. A heat-conducting filling c^3 is interposed between the heater and the casing d, and the whole is secured in the pocket b by suitable means.

22,084. Burn, L. Oct. 6. *Drawings to Specification.*

Steam-traps.—The valve of a steam-trap is closed by the different expansions of a wire and an enclosing tube of small section, the wire being maintained in tension by a spring or weight. The tube and wire may be flexible, and are coiled within the casing of the trap, one end of the tube being attached to a diaphragm, below which the end of the wire carries the valve.

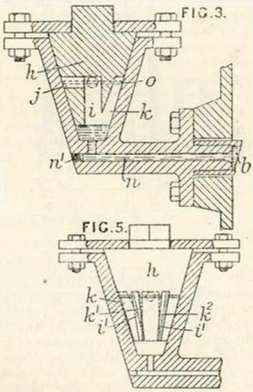
22,593. Reid, T. *June 19.*

Steam-traps.—In a steam-trap operated by the relative contraction of two tubes into which the steam successively passes, the tube in which the water collects is provided with radiating-devices 4 and the other tube with a heat-



retaining covering 5. Specification 14,442/11 is referred to.

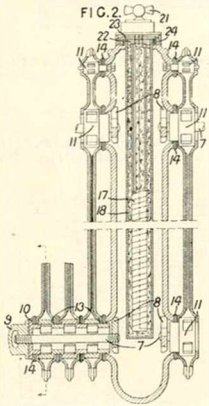
22,595. Macardle, J. St. P. Oct. 13. [*Cognate Application*, 24,850/11.]



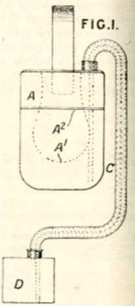
Thermostats.—A conical plug h, Fig. 3, has a central passage i with a port j leading to a gas inlet, and a lateral port k leading to an outlet, the flow of gas being regulated by the expansion and contraction of a liquid such as mercury in a closed tube b; the plug may be rotated by hand to open or close the valve partially or completely. A circular or semi-circular groove o may be formed on the plug to act as a by-pass. The plug may be fitted with a screw plunger to vary the temperature

at which the gas-supply is cut off, and the plunger may be screwed down on a seat. Liquid may be drawn off through a passage n closed by a plug n^1. In the arrangement shown in Fig. 5, the plug h has three lateral ports k, k^1, k^2 with tongues i^1 of different lengths, inlet ports being arranged opposite to the lateral ports, so that by rotating the plug the apparatus may be set to cut off the gas supply at one of three predetermined temperatures indicated on a dial.

22,992. Monnot, J. F. Nov. 12, 1910, [*Convention date*].



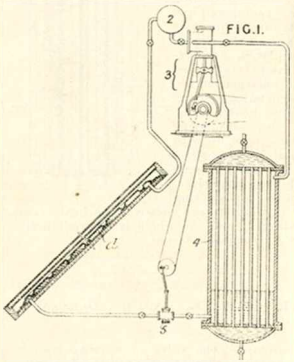
Radiators.—A radiator has a column containing an electric heater and one or more sections connected with the column at three points, one above, one below, and the third at the liquid level. The radiator sections are made of plates of thin metal, stamped with corrugations and with bosses corresponding with the points of connexion with the column. The bosses are spaced by perforated collars 11, which are shaped to fit in each other, and have shoulders 13 to engage with the bosses and packing-rings 14 of metallic or elastic material, or of cement. The collars are secured by a bolt 7 having at one end a star member 8 and at the other a cap 10 and a nut 9. An air-valve may be operated thermostatically. An opening may be provided below the column to enable connexion to be made with a steam or other heating-system.



23,371. Munro, C. S. Oct. 23.

Hot-water bottles. — A hot-water bottle A having inner and outer pockets A^1, A^2 for warming small articles, is connected by a double conduit C with a water-heater D adapted to circulate hot water therethrough.

23,624. Shuman, F. Oct. 25.



Solar heat, utilizing. — Steam below atmospheric pressure is generated in a structure d which is of the type described in Specification 28,273/10 and adapted to be heated by solar rays. The steam passes direct to the chest 2 and engines 3 and thence to the condenser 4. The condensate is returned to the structure d by a pump 5. Plane mirrors may be used to reflect the rays on to the structure d.

23,793. Ogden, G. J., Hay, M. M., and **Templeton, J.** *Dec. 3, 1910.*

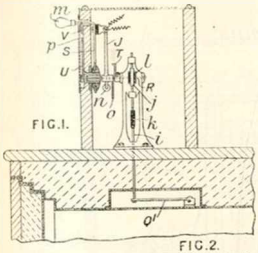


FIG.1.

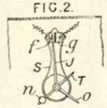
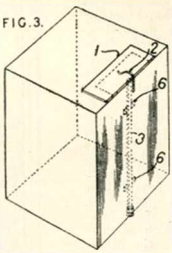


FIG.2.

Thermostats.—In apparatus for controlling a switch for regulating temperature, a thermometric device such as a bimetallic bar Q^1, Fig. 1, operates a rack j and a pinion l secured on a shaft R, which also carries a bent arm T. This arm can engage an arm o on a contact arm J, playing between two contacts f, g, Fig. 2, carried by an adjustable arm S. The arm J is loosely pivoted on the shaft R, and is normally held against the contact f by a weight n. The arm S has a handle m and pointer V by which it can be set, and is pivoted on a hub on the casing. A scale p is provided. The spindle R also carries a pointer U to indicate temperature. The rod i connecting the bar Q^1 with the rack j is in two parts, separated by insulation k. The arm T may be adjusted on the shaft to vary the lost motion relatively to the arm o. The apparatus may be used in an electric oven as described in Specification 28,129/10.

24,027. Berry, A. F. Oct. 30.

FIG.3.



Thermostats.—A ventilating door or valve is opened by the expansion of a straight metal rod when the temperature inside an electric oven is excessive. In the arrangement shown in Fig. 3, a door is opened against the action of a spring 2 by the expansion of a bar 3, which is secured by adjustable nuts to the bottom of the oven and slides in guides 6. Air inlet valves may be controlled by similar thermal means. Specification 20,172/11 is referred to.

24,933. Evershed & Vignoles, Evershed, S., and **Clark, W.** Nov. 8.

Thermostats. — An electrically heated soldering-iron is controlled by one or more bimetallic-strip thermostats arranged within the body of the iron. In one form, shown in sectional elevation in Fig. 1, and in end elevation with the handle removed in Fig. 2, the iron contains three heating-resistances b^1, b^2, b^3, connected in series, one of which, b^1, is short-circuited at low temperatures by a spring-blade i having an insulating button n engaging an adjustable screw g mounted in a

FIG.1.

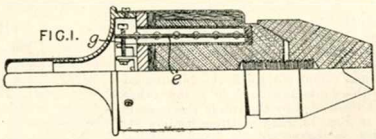


FIG.2.

bimetallic strip *e*. One of the resistances may be controlled by a hand switch (not shown). In a modification, a thermostat connects an external resistance in series with the heating resistances.

25,787. Cramer, S. W. Nov. 18. [*Addition to* 5982/11.]

Thermostats.—Regulators for air-conditioning apparatus, as described in the parent Specification, are provided with means whereby the humidity of the air as well as the temperatures of the wet and dry members are indicated on graduated scales. The wet and dry elements 3, 2 are secured to rods 9, 6 working in guides 10, 7 and attached to levers 11, 8 which operate racks 14, 12. Mounted between these racks is a pinion 16, the motion of translation of which is proportional to the difference in the expansions of the elements. Attached to the pinion is a pointer 17 which travels over a scale 18. The pinion also carries a contact-piece 19, which by coacting with an adjustable contact-piece closes an electrical circuit to actuate the moisture-supplying mechanism. A record-sheet is drawn by clock-work by a bobbin 30 to a bobbin 36, and is marked in passing the idler rollers 32^1 by pens 34, 35 attached to the dry indicator and to the pointer 17 which indicates relative humidity.

FIG. 1.

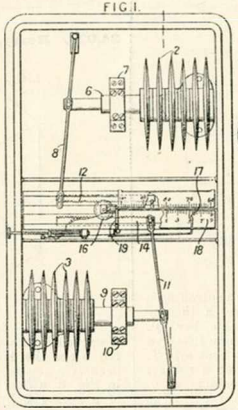
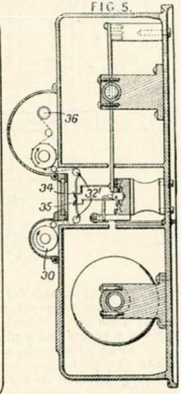


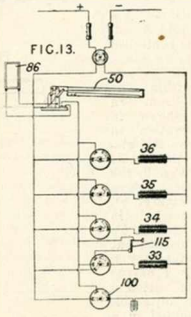
FIG. 5.



25,962. Barker, G., [*Weber & Co., V.*]. Nov. 21.

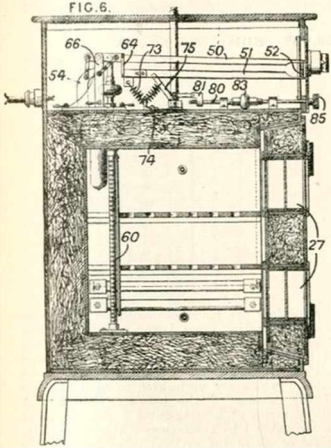
Thermostats.—An electric oven has several heaters one of which is controlled by two thermostats, one inside and the other outside the oven, arranged so that the circuit through the heater is not completed until the circuits of both the thermostats are closed; the other heaters are controlled by the inside thermostat. As shown in Fig. 13, each of three heaters 34, 35, 36 may be connected by hand switches either in series with the thermostat 50 or directly between the mains. The other heater 33 is connected by means of a hand switch 100 either in series with both thermostats 115, 50, or in series with the inside thermostat 50 alone, or directly across the mains. The inside thermostat consists of a thin perforated brass tube 60, Fig. 6, connected with an arm 50 pivoted to a support 54. The arm carries a contact 52 engaging with a contact on an adjustable arm 51, which is secured to a U-shaped hanger 64

FIG. 13.



pivoted to supports 66. A spring 73 is connected between the hanger 66 and a lug 74. Adjustment is effected by means of an arm 75 connected by a spring with the lug 74 and

FIG. 6.

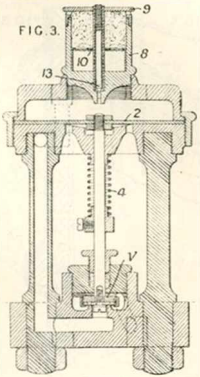


operated through a screw 80, block 81, and adjustable sleeve 83 by means of a head 85. A scale is provided for the setting the thermostat. A condenser is connected across the contacts of the thermostat to prevent sparking.

26,027. Jennings, F. W. Nov. 21. [*Cognate Application*, 10,109/12.]

Thermostats.—A stop-valve for use on heating-systems and of the type actuated by a controlling-medium under the control of a thermostatically actuated auxiliary valve, and provided with a relay valve actuated by fluid pressure under the control of the thermostatically actuated auxiliary valve to control the action of fluid pressure on the main valve, is adapted to be actuated by vacuum. In the form shown in Fig. 3 the relay valve comprises a lift valve *v* loaded by a spring 4 and actuated by a diaphragm 2. The actuating-chamber is fitted with an adjustable air leak 13 fitted with a filter comprising a cup-like casing 8 provided with a removable cap 9, the interior being filled with cotton-wool separated by one or more gauze partitions 10. In a modification the valve is of the piston type and is actuated by pistons provided with lead, rubber, or cork buffers to reduce shock. The apparatus can be

FIG. 3.

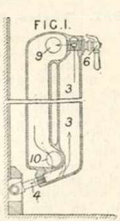


used with the solid expansion thermostat described in Specification 18,969/08.

26,169. Karsten, A. C., Serritstev, H. C., and **De Fornede Jernstoberier Aktieselskab.** Nov. 22.

Radiators. — The circulating medium enters one element of a radiator at the bottom and passes up a passage 3 formed therein to a valve 6, which regulates its passage through apertures 9, 10 to the other elements, which are symmetrically disposed on both sides of the element shown in section. The medium escapes by a pipe parallel and adjacent to the pipe 4 communicating with the radiator through the apertures 10.

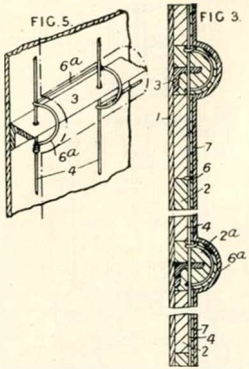
FIG. 1.



26,475. Anderson, R. W. Nov. 27.

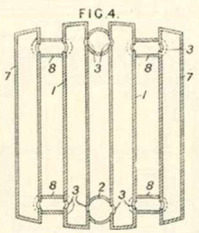
Non-conducting coverings for heat. — Non-conducting coverings formed of slabs of magnesia, asbestos, &c. for walls, ceilings, decks, bulkheads, partitions, &c. are held in position

by wires stretched over the outer surface of the slabs, adjustable in tension, and connected with the wall &c. at their ends only, so as to avoid conduction. Fig. 3 shows a section of a



wall or the like 1 so covered. The slabs 2 are held in place by two interlaced sets of wires 4, 6 lying in the junctions between the slabs. Each wire is provided with a screw device for regulating its tension, and the whole is covered with a layer of cement 7. If there are projections from the surface of the wall, such as the angle-irons 3, these are drilled to pass the wires and covered with special pieces 2^a, round which are led pieces of wire 6^a attached to the main wires 4 as shown in Fig. 5. An analogous arrangement is described where the projections are constituted by channel-iron girders supporting a ceiling.

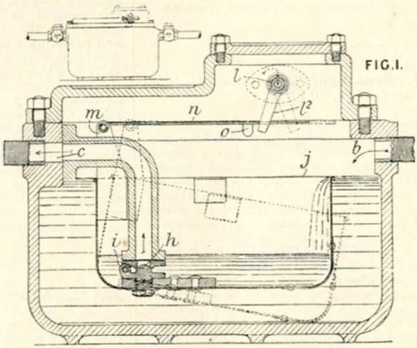
26,628. Siller, W. Nov. 28.



Radiators are made of malleable metal and comprise heating-tubes 1 and connecting-tubes 2 running at right-angles thereto, attached preferably by welding, the last-mentioned having lateral recesses to receive the set of tubes 1 which are perforated as at 3 to allow of the passage of the heating-medium. A second series of heating-tubes 7 can be joined to the tubes 1 by connexions 8 also by welding. Some or all of the vertical tubes may contain air-circulating tubes open at top and bottom.

26,991. Royles, Ltd., and **Royle, J. J.** Dec. 2.

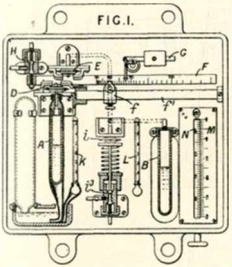
Steam-traps.—In a trap of the bucket type for operating either above or below atmospheric pressure, live steam is admitted, and a valve connecting the trap with a vacuum, or the atmosphere or the space to be drained, is closed at the same time as a water-outlet valve opens. In the trap shown a bucket *j*, pivoted at *i*, has ears *m*, to which is pivoted a plate *n*, also supported at *o*, engaging an arm l^2 actuating a vacuum or low-pressure valve *l*, and a similar arm (not shown) actuating a steam valve on the opposite of the trap. Water enters at *b* and overflows into the bucket,



which sinks and thus opens a water outlet valve *h*, at the same time moving the plate *m* so as to close the valve *l* and open the steam valve. Non-return valves are fitted in the inlet *b* and outlet *c*. A compound valve may be substituted for the two valves *l*. The apparatus may deliver the discharged water to a high level.

27,128. Lake, H. W., [*Buffalo Forge Co.*]. Dec. 4.

FIG. 1.

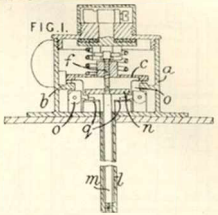


Thermostats.—In apparatus for regulating the humidity and temperature of the air in textile mills &c., a valve i^3 controlling the flow of compressed air to means (not shown) for altering the temperature, is operated against the action of an adjustable spring by a diaphragm *i* influenced by the vapour pressure generated in a chamber B containing a volatile liquid, preferably sulphur dioxide, at the temperature of the air. A valve H, controlling the flow of compressed air to means (not shown) for altering the humidity is operated by a balanced lever F, on an adjustable fulcrum, acted on oppositely by two diaphragms influenced by the vapour pressures generated in the chamber B and another chamber A which is covered with a wet wick. In a modification, the lever F is omitted.

27,215. Yates, H. J., and **Harvey, F.** Dec. 5.

Thermostats.—A valve *c* is kept open at a constant distance from its seat *b* by means of one or more levers *o* which are moved inwards by the expansion of the tube *l*, and the valve, when released, is closed suddenly by a spring; contraction of the tube causes a rod *m* to lift the valve, and springs *q* return the levers to their normal position. A disk *n* carried by the rod engages with the levers. The valve has a screw *f*, which can be adjusted from outside the valve casing *a*. The screw may be adjusted to bear against the rod *m* so that the valve is kept slightly open when the levers are

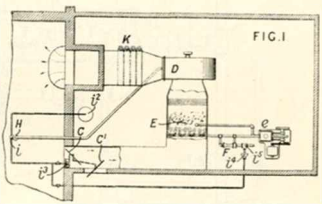
FIG. 1.



withdrawn, further expansion of the tube causing the valve to close. The apparatus may be used for controlling the gas supply to a boiler.

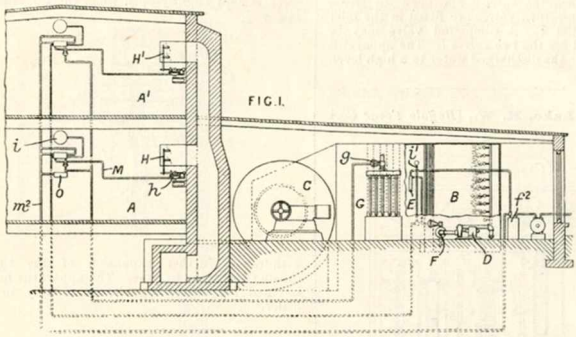
27,237. Lake, H. W., [*Buffalo Forge Co.*]. Dec. 5.

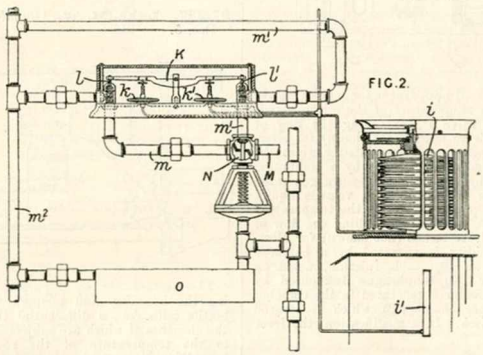
FIG. 1



Thermostats.—In an apparatus for regulating the humidity and temperature of air in textile mills &c., a differential thermostat H, the elements of which are subjected respectively to the temperature of the room and the humidifier E, controls means for varying the temperature of the water used for saturating the air, instead of, or in addition to, controlling, as hitherto, connected dampers C, C¹ for varying the proportions of 'fresh air' and 'return air' admitted to the humidifier. In the form shown, the water circulated through spraying-nozzles by a pump *e* is heated by a steam injector F; the thermostat H operates a valve *i* which controls the supply of compressed air from a reservoir i^2 to diaphragms i^4, i^3 actuating respectively the steam-supply valve i^3 of the injector F and the dampers. Specification 16,279/08 is referred to.

27,249. Lake, H. W., [*Buffalo Forge Co.*]. Dec. 5.

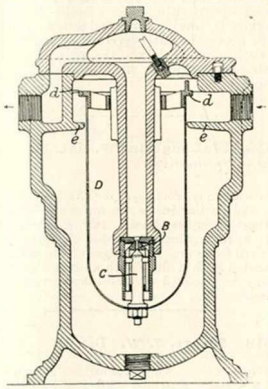




Thermostats.—The humidity and temperature of the air in one or more rooms of a building are controlled by supplying the room with air which has been saturated at a definite temperature, and maintaining the room temperature at a desired amount above the saturation temperature by the automatic variation of heating and cooling devices. The fixed difference between the room and saturation temperatures is preferably maintained by regulating the volume of saturated air admitted to the room, and for this purpose dampers may be operated through the medium of a differential thermostatic regulator having two elements subjected respectively to the room and saturation temperatures. The air is saturated at a predetermined temperature when the wet-bulb temperature permits this, otherwise it is saturated at the wet-bulb temperature. The rooms A, A^1 of a building are supplied with saturated air from a humidifier B by a fan C. The spray-water circulated by a pump D is heated by a steam injector F, and the predetermined saturation temperature is maintained by means of a thermostat E which controls the supply of compressed air from a reservoir f^2 for actuating the steam-supply valve of the injector. The saturated air is heated, when necessary, before entering the rooms, by a heater G, the temperature to which the air is heated being regulated by a steam-supply valve under the control of a thermo-

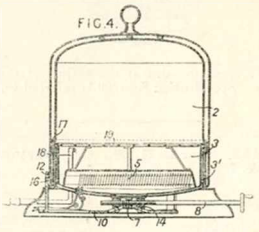
stat O in the room. The dampers H, H^1 are opened and closed by compressed-air diaphragm motors *h* according as a relief valve in the compressed-air pipe M is opened and closed by means of a differential thermostatic regulator having elements *i*, i^1 containing a volatile fluid subjected respectively to the room and saturation temperatures. One element i^1, common to all the regulators, is sufficient. The vapour pressures generated in the elements are applied to diaphragm motors *k*, k^1, Fig. 2, acting in opposition upon the operating-lever K of the relief valve. When cold saturated air is admitted to the room, opening the dampers increases the relative humidity, but when the heater is on and the temperature of the saturated air is above that of the room, the relative humidity is decreased by opening the dampers. Means such as are shown in Fig. 2 are therefore provided whereby the action of the elements *i*, i^1 on the dampers is reversed whenever the heater is turned on and off by the thermostat O. Two relief valves *l*, l^1 are used, which are located at opposite ends of the pivoted operating-lever K and are consequently acted upon in opposite fashion by the motors *k*, k^1. Either valve becomes operative according as a valve N operated by the thermostat O permits compressed-air to flow from the pipe m^2 to the pipe M by way of the conduit *m* or the conduit m^1 respectively. Different relative humidities may be maintained by making the element *i* of adjustable capacity; and the adjustment necessary to give any desired relative humidity may be indicated by a scale attached to the element. In a modification, in which the heater is located in the room, one relief valve only is necessary. The thermostat O in this case controls pressure-operated valves in the compressed-air pipe leading from the regulator to the heater and dampers. At a predetermined maximum room temperature, the thermostat shuts off the heater and permits the regulator to control the dampers. At a predetermined minimum room temperature the thermostat suspends the control of the dampers and turns on the heater.

27,258. Dewrance, J. Dec. 5.



Steam-traps.—In a steam-trap in which a bucket D carries a pilot valve C connected, with lost motion, to the main discharge valve B, the top of the bucket is provided with a rim or lugs *d* adapted to seat on lugs *e* in the trap casing. The lugs *e* may form a shield to prevent water from being forced from the casing into the bucket by inrush of steam; or an independent shield for this purpose may be provided below the steam inlet. Specification 16,606/03 is referred to.

27,285. Carpenter, A. Dec. 5.

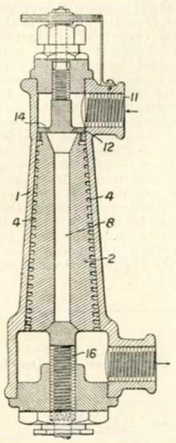


Thermostats. — In cooking-apparatus heated by electricity or otherwise a steam-pipe 18 passing through the base 3 which contains water, is connected with a pressure-actuated regulator.

27,336. Raffensdorfer, F. Jan. 2, [*Convention date*].

Steam-traps.—In a trap of the kind in which the water escapes through a helical duct, the duct increases in cross-section towards its outlet. A valve for regulating the admission of steam and water and a valve for discharging water during the preliminary warming of the apparatus are provided. In the trap shown, a helical groove 4 formed on a core 2 in a casing 1 increases in depth towards the bottom of the core. The inlet branch 11 communicates with the top of the

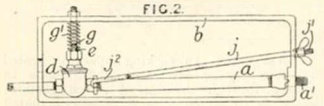
groove through a disk valve 12, which is provided with perforations 14 opening into a central passage 8 in the core. A discharge



valve 16 is provided at the bottom of the passage. Specification 8395/09 is referred to.

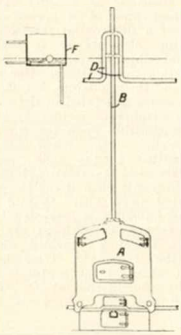
27,443. Lord, G. S., and **Barlow, P.** Dec. 7.

FIG. 2.



Steam-traps.—An expansion tube *a*, in which condensed water collects, is pivoted near the inlet a^1 to a frame *b*, and is held at the other end by the forked end j^2 of an inextensible rod *j*, which is adjustably secured to the frame at j^1. The tube *a* carries at its outlet end a valve member *d* which, on expansion of the tube produced by entrance of steam, rises relatively to the frame against the action of a spring g^1 until the valve stem *e* engages a stop *g* and thus closes the valve. The frame *b* may be fixed, and the tube *a* connected to the inlet and outlet pipes by flexible tubes, or the tube *a* may be fixed and the frame movable.

27,694. Holladay, E. Dec. 9.



Heating buildings.—An installation for hot-water heating is arranged to dispense with a distributing-tank and also with valves. From a stand-pipe B rising from a boiler A proceed flow-pipes D, leaving the stand-pipe at a height a little above the water-level in the supply-tank F. Each pipe D leaves the pipe B by two outlets, as shown, to avoid blocking by incrustation.

27,759. McLoughlin, W. Dec. 11. *Drawings to Specification.*

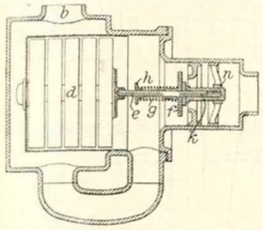
Non-conducting coverings for heat. — Electric, heat, and similar insulators are made by securing together layers of mica, talc, &c. by casting metal upon, against, or about the portions it is desired to secure. The edges of the mica may be treated with a flux, such as borax or resin, or may be grooved or dovetailed previous to casting.

27,818. Ewart, J. W. Dec. 11.

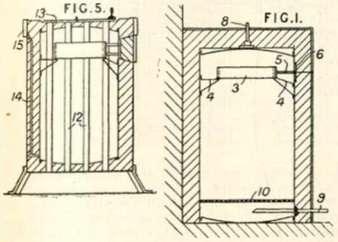
Thermostats. — An expansible chamber *d* carries a rod *e* provided with a screw-threaded sleeve *k*, which slides in a guide *n*. A valve *f* is held against the sleeve *k* by a spring *g* with an adjusting nut *h*, this spring yielding on excessive expansion of the chamber *d*. In the arrangement shown, water or other fluid enters at *b* and passes the valve unless it becomes hotter than the temperature for which the valve is set; but the arrangement may be varied for different applications.

(For Figure see next page.)

27,818.

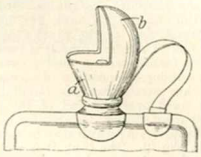


27,843. **Rittershaussen, A.** Dec. 11.



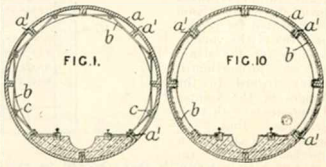
Heat-storing apparatus.—Heat-storing apparatus consists of a vessel, preferably heat-insulated, containing water which is heated by an electric heater located at the top. In the arrangement shown in Fig. 1, the electric heater 3 is supported on brackets 4. A perforated baffle 10 is located near the bottom of the vessel to distribute the water from a supply pipe 9, and prevent eddies. Hot water is drawn off from the top through a pipe 8. The electric heater may be surrounded by a casing open at the top and bottom, in the water. In the arrangement shown in Fig. 5, air-ducts 12 are provided through the apparatus, and a damper 13 for regulating the supply of warm air from them is mounted on the top or bottom. A pressure-relief pipe 14 may be fitted, which, with a receptacle 15, may be used to supply moisture to the air. The apparatus may be connected with a hot-water system of radiators.

27,933. **Rowe, T.** Dec. 12.



Hot-water bottles.—The filling-funnel *a* of a hot-water bottle is provided with a shield, such as *b*, to protect the person filling the bottle from hot water that may be spurted out.

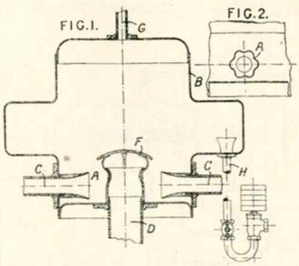
28,031. **Evans, C. J.** Dec. 13.



Non-conducting coverings for sound.—Sound is deadened in railway, tramway, and like tubes by attaching to the interior of the tube a lining of suitable sheet fabric or like material which does not reflect sound, the material being preferably rendered non-inflammable. The lining may be of india-rubber, parchment, silk, aeroplane or balloon fabric, felt, canvas, linen, sail cloth, velvet or other pile fabric, asbestos cloth, or the like, and may extend the entire length and circumference of the tube, or part or parts thereof. In the form shown in Fig. 1, the lining *b* is projected from the wall *a* of the tube by the flanges a^1, between which it is secured by studs *c*, washers, and battens, the last being preferably of wood rendered non-inflammable. In a modification, the lining is secured similarly, or by means of screw clamps, spring clips, or the like, or by V-shaped battens at the sides of the flanges, so as to extend directly from flange to flange. The lining may be projected from the wall of the tube by means such as studs or distance-pieces which may consist of rings notched to receive the flanges a^1. The air-space between the lining and the wall may be filled with slag-wool, asbestos-wool, or other suitable non-inflammable material. In the form shown in Fig. 10, the lining *b* is secured directly to the wall of the tube.

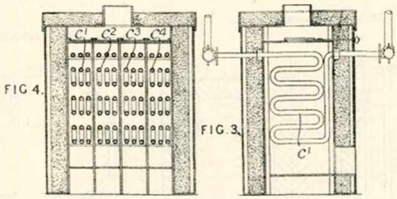
28,397. Ellison, T. G. Dec. 16.

Heating by circulation of fluids.—Relates to a distributing header or tank for hot-water heating-systems, and to the pipes entering it. The upper end of the flow-pipe D is contracted, as shown, or formed with a double cone. This construction induces formation of steam in the pipe and thus accelerates the circulation. A baffle F is fixed over the end of the pipe D. The distributing-pipes C are formed with conical mouthpieces A, which may be corrugated as shown in Fig. 2. The tank B is widened as shown, to allow of expansion, and is provided with an overflow pipe H, fitted with an automatic relief valve. A vent-pipe G is also provided.



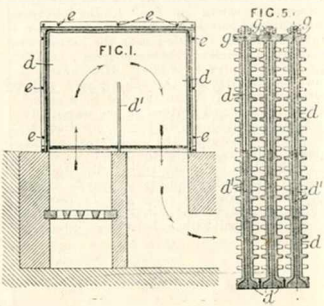
28,963. Humphrey, G. F. Dec. 22.

Heating by circulation of fluids.—In a system for heating bakers' ovens &c. by means of superheated steam &c., the steam being heated for re-use, the areas of the various passages for the steam are so proportioned, having regard to the changes of the volume of the steam with temperatures, that the steam passes through a superheater and radiator at high velocity, is then checked so as to increase its pressure, then passes through a second superheater, where its temperatures and velocity are increased, then through a second radiator, and so on. To effect this, if the area of the passage from the boiler to the first superheater is taken as 1, that of the superheater tubes may be 3½, that of the radiator-tubes 9, and that of the passage to the second superheater 2¼. Valves are provided for cutting out any desired radiator, or for blowing off any radiator or superheater while heating-up. Figs. 3 and 4 show a suitable arrangement of four sets of superheater tubes c^1, c^2, c^3, c^4 in a furnace divided into separately-fired compartments.



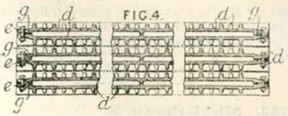
29,166. Alldays & Onions Pneumatic Engineering Co., and **Stott, O.** Dec. 28.

Radiators.—Relates to radiators for heating buildings &c. of the kind comprising flat plates placed together so as to form alternate flues for hot gases and air to be heated. Flanged plates *d* connected in pairs from hot gas flues, and their outer surfaces are flanged at the top and bottom so that, when a number of pairs are placed together, air-heating passages are formed between them. Each flue is divided by a vertical partition extending from the bottom to near the middle and constituted by a rib d^1 on each plate; or more than one partition may be used. The opposing flanges are a sufficient distance from the edges of the plates to allow room beyond them for the connecting-bolts *e*, and the apertures for the bolts are in the form of notches



to allow of ready erection. The joint is made by asbestos cord &c. *g* in grooves in the flanges. The flue openings and outlets are flared as shown at the bottom of Fig. 5. The two plates forming a flue unit may be cast in one. The radiator may be used in connexion with a special furnace as shown in Fig. 1, or may be heated by the hot gases from an existing furnace.

FIG.4.



29,223. Sterne, L. Weigert-. Dec. 28.

FIG.1.

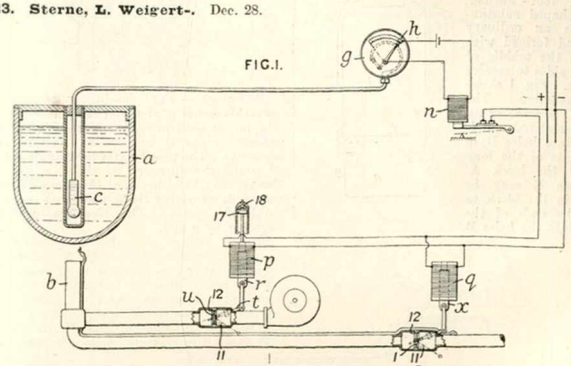


FIG.2.

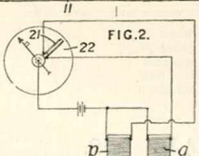
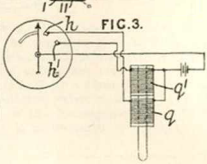


FIG.3.

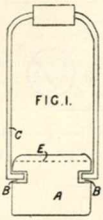


Thermostats.—Apparatus for regulating temperature consists of a fluid-container placed in a heated receptacle and connected to a pressure gauge which controls an electro-magnet or solenoid regulating the supply of heat. In the arrangement shown in Fig. 1, as applied to a pot *a* for melting stereotype metal, a steel tube *c* containing mercury is enclosed in an outer tube and connected with a pressure gauge *g* of the Bourdon type, which is fitted with an adjustable contact-arm or index *h*. The contacts are in circuit with a relay *n*, which controls the circuit of one or more solenoids *p*, *q*, the cores *r*, *x* of which are connected by weighted arms *t* with valves *u*, 1 admitting air and gas to a burner *b*. The movement of the cores or valves may be limited by stops 11. The valves are pivotally mounted to move within rings 12. The air valve is adapted to be re-opened after the gas valve, and for this purpose the core *r* is fitted with a dash-pot device comprising a plunger 17 and a non-return valve 18, which allows unrestricted movement of the plunger upwards, but retards its movement downwards. Instead of the dash-pot, a single solenoid may be used having its core connected by a lost-motion device with the valves. Another arrangement for this purpose is shown in Fig. 2, in which an adjustable index is used having two spring contacts 21, 22 connected separately with the two solenoids. In the arrangement shown in Fig. 3, additional movement of the core at a higher temperature is effected by means of a solenoid with two windings *q*, q^1 controlled by two contacts *h*, h^1, which are connected in circuit at different temperatures. The arms *t* may move between adjustable stops, or the coils of the solenoids may be adjustable to vary the travel of the cores. One or more solenoids may be adapted to operate a switch controlling the circuits of electric heaters, or of resistances in series with heaters. The appa-

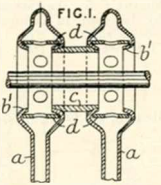
ratus may also be arranged to control a damper, or to raise and lower the fire-bars of a furnace, the bars being supported in a counterbalanced frame.

29,238. Micklethwait, R. Dec. 29.

Bed - warmers. — A block for use as a bed-warmer, foot - warmer, &c. is shaped substantially as an ordinary brick and formed with holes in the middle of the long sides to receive a handle. Fig. 1 shows a cross-section. The handle C is made of an elastic metal rod and is sprung into holes B in the middle of the long sides of the block A. A groove E may be formed in the block to guide the ends of the handle into the holes B.



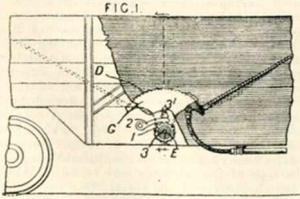
29,393. Büttner, A. Jan. 5, [*Convention date*].



Radiators. — For joining adjacent sheet-metal elements *a* of a radiator, a double-coned nipple *c* is used in conjunction with perforated internal rings *d* to prevent collapse of the elements. The coned parts bear against flanges b^1 round the apertures of the elements, which flanges may be either bent inwards as shown, or outwards, forming in either case an elastic fluid-tight joint. The elements are forced together by a rod.

A.D. 1912.

1355. Babbitt, G. E. Jan. 18, 1911, [*Convention date*].



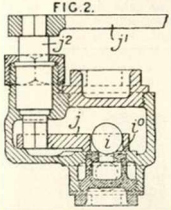
Heating - apparatus.—A hopper wagon is fitted with a hollow sector-shaped door having means for heating it should it be obstructed by ice. The door D, which may be a hollow casting or constructed of thick sheet metal, is connected as shown to a flexible pipe leading to a steam supply. In a modification, the door is not completely enclosed, and a trough, into which fuel or moistened lime may be placed, is suspended beneath it from the side pieces G.

1977. Sawyer, R. *Feb. 6, 1911.*

Steam-traps.—A valve for use in steam heating-systems, stated when in the closed position to allow water to pass but not steam, comprises a solid ball *i* of brass or steel working in con-

junction with a seat i^6 of vulcanite arranged in a horizontal inlet passage. The ball is

FIG. 2.

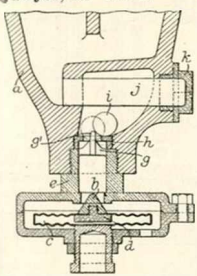


loosely mounted in a pivoted carrier j secured to a spindle j^2 rotated by a handle j^1.

2143. Molinas, L. Jan. 26, 1911, [*Convention date*]. *Void.* [*Published under Section 91 of the Act.*]

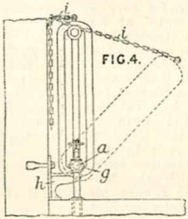
Heat-storing apparatus. — Consists in the application to all kinds of heaters of the property possessed by salts of giving off, in crystallizing, the heat absorbed in their fusion. One suitable mixture is made up in the proportions:—20 parts of sulphate of soda, 20 parts of hyposulphite of soda, 20 parts of acetate of soda, 2 parts of potash alum, and 1 part of chrome alum.

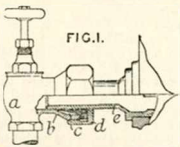
2851. Sawyer, R. Feb. 3.



Steam-traps.—A drip-pocket a for use in a steam-heating system is provided with a thermally-controlled valve b acting as a steam-trap, and a pin or projection g^1 which normally holds a valve such as a ball-valve i away from its seat, so that if the casing containing the valve b is removed for repair or inspection, the ball-valve returns to its seat and prevents the escape of steam. In the arrangement shown, the valve b is controlled by a capsule c containing a volatile liquid, and is secured to a plug d. The pin g^1 is carried by a spider g. A strainer j fitted in a plug k may be placed between the drip-pocket and the trap.

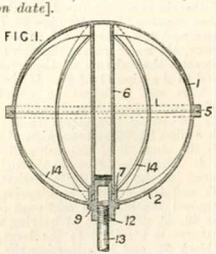
2990. Biggin, F., and **Firth, T. H.** Feb. 6.





Radiators.—In swing radiators, the weight is taken by journals g formed in supporting brackets h so that the connexions with the inlet and outlet valves are relieved of strain. The radiator is held by a chain i. A pipe e screwed to the radiator enters a socket b on the valve casing a, or this arrangement may be reversed. The joint is made tight by packing c held by a nut d.

3120. Cookson, T. J. Feb. 20, 1911, [*Convention date*].

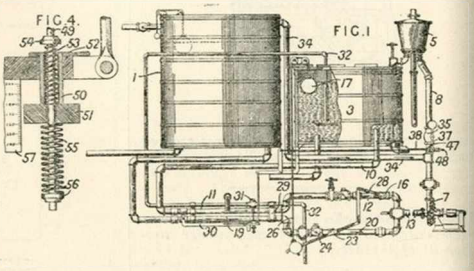


Steam-traps.—A float is constructed in two

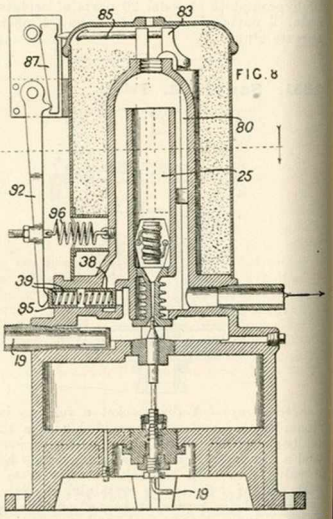
sections 1, 2 having interlocking surfaces 5 at their meeting edges. One of the sections 1 is provided with a hollow or solid strut 6, which engages in a projecting collar 7 on the other section 2 and is screwed to a socket 12 which receives the actuating-rod 13. The socket 12 has a bevelled face 9, which engages with a corresponding face on the float. Ribs 14 are provided on the interior of the float for strengthening purposes.

3441. Caps, J. E., and **Cartwright, C. A.** Feb. 10.

Thermostats.—In an installation for supplying hot water at an adjustable temperature maintained automatically, water from a hot-water tank is circulated through a device for heating by exhaust steam, and when it reaches the required temperature is diverted to a cold-water tank, from which the hot-water tank is supplied. Means are also provided for regulating the supply of water and an extra supply of live steam for heating. Water from a tank 3 is circulated by a pump 7 through pipes 10, 11, 12, 13, 8 and a device 5 heated by exhaust steam. When the temperature of the water has been raised sufficiently, the expansion of the pipe 11 actuates a lever 30, and this operates a valve 35 in the pipe 8. The valve 35 is actuated by a weighted lever 37, the end of which engages with a slotted link 38. The length of the slot can be adjusted by screws 47, 48, and the temperature at which the valve is operated thus regulated. The lever 37 may be rigidly attached to the valve 35 or may be actuated by means of a projection engaging with a recess in the valve spindle, so that the valve is suddenly opened and closed. When the valve 35 is closed, part of the water still passes through an opening in it to the heater 5 and tank 3, but the greater part passes by a pipe 34 to a cold-water tank 1. When the water-level in the tank 3 falls, a float 17 therein closes a valve 16 in the pipe 12 and opens a valve 23 in the pipe 20, by which water can pass from the tank 1 to the pump 7. On its way, the water passes through a pipe 19, which carries the fulcrum of the lever 30 and is secured to the pipe 11 at 29. If the heating-device 5 is not sufficient to maintain the required temperature, the lever 30 opens a valve 31 admitting live steam to the tank 3 through a pipe 32. The connexion of the lever 30 with the stem 49 of the valve 31 is shown in Fig. 4. The stem 49 passes through a block 51 secured to the lever by a hollow screwed stem 50 and lock-nut 52, and springs 53, 55 press against the block 51 and caps 54, 56 on the stem 49. A projection 57 bearing a scale of temperatures is attached to the lever 30 close to the block 51, and by adjusting the block 51 the valve 31 is caused to open at the required temperature.



3526. White, M. C., and **Duryea, O. C.** Feb. 15, 1911, [*Convention date*].



Thermostats.—Compressed air for operating

tools or machines is heated by providing within the air conduit special means for generating combustion products and mixing them with the compressed air, the supply of which may be regulated thermostatically. Compressed air is supplied through a pipe 19 and a valve 38 to a U-shaped passage surrounding a tubular combustion chamber 25 and having an outlet port connected to the main air-conduit. By varying the tension of a spring 39 on the back of the valve 38 the proportion of air passing to the U-shaped passage and the burner may be varied. The tension of the spring 39 may be regulated by a thermostatic device which consists of a vertical rod of copper or other suitable metal 80 arranged in the U-shaped passage and resting at its lower end on a fixed bearing, while at its upper end it bears on one arm of a lever 83, through which motion is transmitted to a rod 85 and levers 87, 92. The end of the lever 92 bears against a sliding cap 95 enclosing the outer end of the spring 39. A spring 96, the tension of which may be adjusted, serves to hold the end of the lever 92 against the cap 95.

4072. Wheeler, A. E., and **Ridley, C. J. H.** Feb. 17.

FIG. 5.

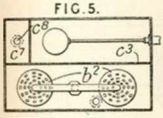
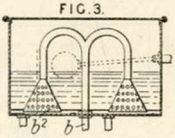


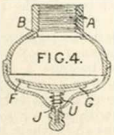
FIG. 3.



Heating buildings.—In a low-pressure hot-water heating-system the rising pipe from the boiler is carried to a point above the level of the water in the distributing-tank and bent over so as to open below the water-level in the tank and thereby cause a 'siphonic or suction action' for accelerating the circulation. In the form shown in Fig. 3, the pipe b is divided into two branches bending over as described and terminating in enlarged perforated ends b^2. Fig. 5 shows a plan of the tank. It is divided into two compartments by a partition c^3, which does not quite extend to the bottom of the tank. One compartment contains the pipe b and the other the inlet ball-cock. A third compartment c^7 is separated from the rest of the tank by a partition extending to just above the water-level. If the water boils, it overflows this partition and, passing down a pipe c^8 gives warning that the water is overheated.

4227. Williams, M. H. Feb. 20.

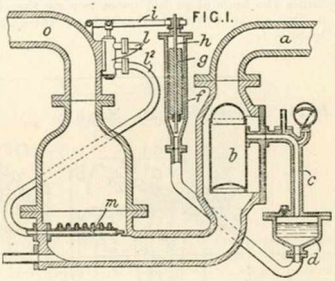
FIG. 4.



Steam-traps.—A discharge valve, arranged to be closed by the pressure of steam against the action of a spring, for use in the heating of railway carriages, comprises a casing containing a valve disk F with a rubber face G, and a spring U opening the valve when the steam is shut off, whereby the water of condensation can drain away through holes in the casing around the spindle J. A piece of wire gauze B is arranged below the neck A; the lower part of the valve casing can be detached by unscrewing.

4351. Wedekind, C. Feb. 22, 1911, [*Convention date*].

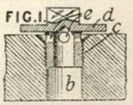
FIG. 1.



Thermostats.—In order to control the supply of cooling-water to a gas turbine, an air vessel b in a tube a, through which the turbine exhaust gases pass, communicates through a pipe c with vessels d, f containing a liquid such as mercury, to operate a float g made of cast-iron for instance. The guide-rod h of the float operates a lever i and a valve l admitting cold water through a pipe l^2 to the nozzles m of an injection condenser.

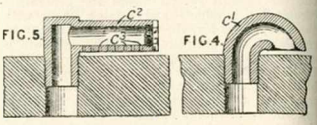
4812. Yates, J. H. Feb. 26.

FIG. 1.



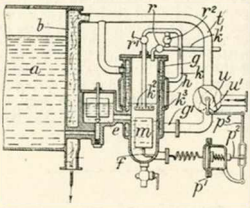
Steam-traps.—The outlets to drain-cocks for

cylinders, valve-chests, or other steam chambers are provided with shields to prevent escape of steam before the water has been discharged completely. In the form shown in Fig. 1, a plate d is formed on a plug c, which screws into the discharge passage b. The plate d may be dish-shaped, or may be flat, as shown, in which case the passage b is countersunk to uncover the opening e in the plug c. Fig. 4 illustrates the use of a bent tube c^1, and Fig. 5 shows a pipe c^2 with one or more branches having perforations c^3 in their lower surfaces.

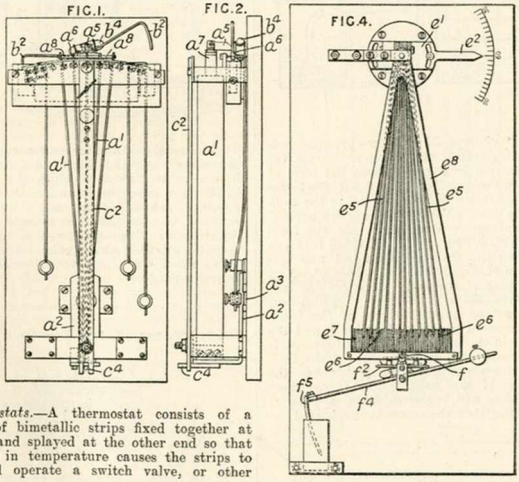


5139. Lion, G. P. J. Sept. 20, 1911, [*Convention date*].

Thermostats. — The temperature of naphthalene in a tank f is controlled by a thermostat comprising a vessel m containing air, the pressure changes in which due to variation of temperature affect a rubber diaphragm p^1. This diaphragm actuates though a rod p^2 and lever p^3 a valve u^1, the position of which determines the amount of hot gases flowing through a pipe g^1 to warm the tank f, or through a by-pass t.



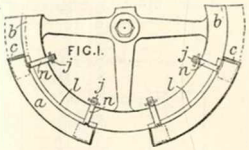
5311. Grundy, H. H. March 2.

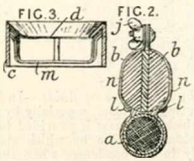


Thermostats.—A thermostat consists of a number of bimetallic strips fixed together at one end and splayed at the other end so that a change in temperature causes the strips to bend and operate a switch valve, or other

device. In the arrangement shown in front and side view in Figs. 1 and 2, bimetallic strips a^1 are secured at one end to a holder a^2 pivoted at a^3 to the frame, the other ends being separated by distance-pieces a^8 and connected by a flexible coupling with a finger a^5 engaging with a slot on a rocking arm a^6. The flexible coupling may be obtained by cutting away the ends a^7 of the strips, or by securing narrow strips to the ends. The rocking arm carries contact-arms b^2 dipping into mercury cups, and is fitted with an overbalancing weight such as a tube b^4 containing a material or liquid such as mercury; or the arm may carry a mercury switch consisting of one or more tubes containing mercury and fitted with contacts. A slight movement of the finger causes the arm to overbalance, the walls of the slot being so formed that the finger is then free to continue its movement. The finger, when moved in the opposite direction, engages with the slot so as to bring the arm back to its normal position. The apparatus is set for operation at any desired temperature by means of a pointer e^4 pivoted to the frame and moving over a scale, the lower end being forked to engage with a pin e^5 fixed to the frame a carrying the strips. Any movement of the pointer from the central position causes the lower end of the strips to be raised, thus compensating for the shortening of the strips with change of temperature, and avoiding locking of the finger in the slot. In the modification shown in Fig. 4, the strips e^2 are secured at one end to a pivoted plate e^1 provided with a pointer e^3, and the other ends are fitted with pins e^6 engaging between the teeth of a comb or slotted plate e^7 which is carried by a pivoted frame e^8. A finger f secured to the frame engages with a slot formed on a rocking arm f^2 which is fitted with an overbalancing tube. A second rocking arm f^1 is actuated by the arm f^2, and carries an overbalancing tube and contacts f^5 dipping into mercury cups. The frame carrying the strips may be fixed, and the finger may be adjustable so as to allow of setting.

5465. Brown, V. F. D. March 5.

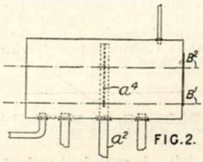




Hand-warmers.—A hand-warmer to be attached to the steering-wheel of a motor-car consists of a metal tube, curved to fit the wheel and attached thereto and containing heated blocks or fuel which may be held in place by perforated caps. The hand-warmer a is provided with a curved seating l fitting against the wheel b, and is secured to the wheel by metal straps n and clamps j. The ends of the hand-warmer are fitted with caps c, Fig. 3, with wire gauze covers d and bent metal strips m which prevent the heated blocks or fuel from touching the wire gauze. The hand-warmer may extend all round the wheel, in which case it is provided with sliding doors for the insertion of the blocks or fuel.

5818. Poole, A. R. March 8.

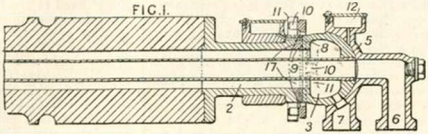
Heating buildings.—The water inlet to the distributing-tank of a low-pressure hot-water heating-system is so arranged that a larger inlet area is exposed as the water rises in the tank on account of heating and consequent expansion. This is effected by prolonging the inlet pipe a^2 above the hot-water level B^2 and forming in it a slit a^4 extending from below the cold-water level B^1 to above the hot-water level B^2.



5885. Nuttall, J. March 8.

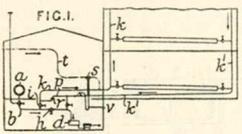
Steam-traps for draining rotary drums. Devices constructed as described in Specifications 7111/09, 19,285/09, [both in *Class* 99 (i), Pipes and tubes, Joints &c. for], and 30,501/09 are modified by making the spherical head 3 used therein as a separate piece formed with a face 8 adapted to bear against a surface 9 on the end of the trunnion 2. This bearing-surface may be provided by a renewable ring 17. The head may be rotated by a pin 10 on one bearing-face engaging a recess in the lug 11 on the other, or by connexion with the central pipe. It may be seated in a casting 5, which includes the steam-inlet 6, water-outlet 7, and lubricator and filter 12. The trunnion may be embraced by a casting secured by bolts and springs to the castings 5 and carrying a lubricator and filter. The escape of water may be arranged to occur at intervals, the device acting as described in Specification 30,501/09.

FIG. 1.



6407. Wagner, B. R. March 14.

FIG. 1.

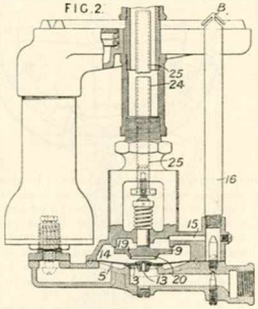


Heating by circulation of fluids.—In installations for heating by steam, especially by exhaust steam, in which a by-pass is provided furnished with an automatic valve by which steam can pass directly to the condenser when the radiators, or some of them, are shut off, a second by-pass is provided fitted with a hand-operated valve for use when the heating-installation is not to be used. Also means are provided for admitting a supplementary supply of steam if the temperature of the steam leaving the radiators falls too low. In the arrangement shown, the flow pipe k and the return pipe k^1 are connected by a pipe p in which is a loaded valve r. The pipes k, k^1 both branch from a pipe b connecting the exhaust from an engine a with a condenser d, and between their junctions with the pipe b is placed a hand-operated valve h. In the pipe k^1 is placed a vessel containing a fluid having a high coefficient of expansion communicating by a pipe b with the box of a valve s which controls a pipe t, whereby live steam can be passed to the pipe k.

6678. Dicker, S. G. S., [*Wood Manufacturing Co., J.*]. March 18.

Thermostats.—A water-heater, heated by a gas burner, has a fluid-pressure actuated gas-valve under the control of a thermostatically actuated auxiliary valve. The gas valve 3 is mounted on a diaphragm 5 having a leakage port 13 and is controlled by an auxiliary valve 9 actuated by a copper tube 24 and carbon rod 25. The exhaust from the diaphragm chamber

FIG. 2.

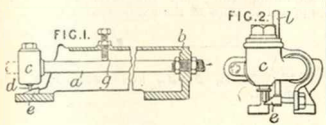


is led by a passage 15 to the mixing-chamber of a blue-flame pilot jet 16, provided with a protecting-hood B. When the main valve 3 is open, it touches a flange 19 on the pilot valve, forming a chamber having an outlet 20 considerably smaller than the leakage port 13, thus reducing the exhaust.

7072. Paterson, R. H. March 22.

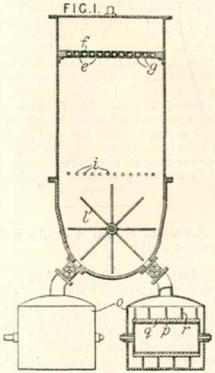
Steam-traps.—In an expansion trap, an inclined plane or wedge is arranged to operate the valve stem directly. In the arrangement shown in Fig. 1, a single tube a fixed at one

end carries at the other end a valve, the stem *d* of which engages with an inclined plane *e* formed on the frame *b*, the tube being guided by means of a screw *g*, which may be so placed



as to cause the spring of the tube to assist in opening the valve. In the arrangement shown in Fig. 2, two tubes of different metal are connected to a head *c* moving laterally over a wedge *e*, which may be formed on the end of an adjustable blow-through lever *l*. In a modification of this construction in which one of the tubes is a flexible drain tube, a strut is used. In all these arrangements, the valve stem may be placed at right-angles to the plane or wedge by canting the head. Specifications 6004/06 and 1070/11 are referred to.

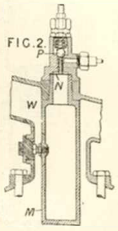
7152. Vouga, M. June 12, 1911, [*Convention date*].



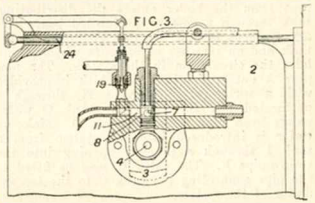
Heating - apparatus. — Sheets of condensed milk alone or in admixture with coffee, cocoa, &c., are broken up by a rotary beater *l*, and the products are directed into containers *o*, in which a final heating may be effected by passing hot air through a rotary drum *p* having an insulating coating *q* of wood or the like and fitted with stirring-arms *r*.

7344. Adams, A. H., Normanville, E. de, and **Adams Manufacturing Co.** March 26.

Thermostats. — In order to prevent overheating of the cylinders of internal-combustion engines cooled by a circulating liquid, air is supplied to the circulatory system by a valve P, controlled by the expansion of mercury or a volatile liquid contained in a closed vessel M placed in the heated liquid, acting upon a diaphragm N.



7713. Haddan, R., [*Debrunner, W. E.*]. March 29.

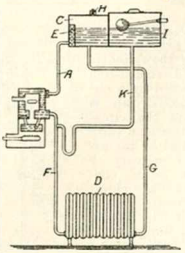


Thermostats.—The amount of water delivered to the internal vaporizer of an internal-combustion engine is regulated by a valve 19 controlled by a thermostatic device in contact with the vaporizer. As shown, this consists of an expansible rod 24, but in other constructions an expansible chamber or a Bourdon tube containing gas or mercury, or a bimetallic strip may be substituted. The invention is described in relation to that of Specification 3266/11, [*Class 7* (iii), Internal-combustion engines, Carburetting-apparatus &c. for].

7745. Magelssen, N. March 30, 1911, [*Convention date*].

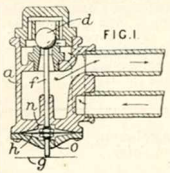
Fire-proof coverings.—Relates to a process for applying a fire-proof coating to floors, walls, &c., also applicable to the manufacture of fire-proof building-blocks, floor coverings, roofing-slabs, and pipes. A sheet of paper is covered with a layer about two millimetres thick of a fire-proof plastic composition containing asbestos &c. and water-glass, which will set hard on exposure to the air. The composition is applied to the surface it is desired to coat by spreading the prepared sheet over it and then stripping off the paper.

7987. Fenlon, H. T. April 2.



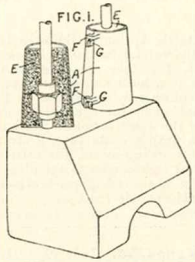
Heating buildings.—In a system for heating buildings by hot water, also applicable to supplying hot water for baths, sinks, &c., the flow pipe from the boiler enters the distributing-tank through a rose or perforated box. This arrangement is said to cause ebullition in the tank and an increase of pressure which stimulates the circulation in the system. The flow pipe A enters the tank C, which is provided with a spring-controlled vent H, through a perforated box E. From the tank C water passes by a pipe G to radiators D. Make-up water is introduced into the system from a tank I through a pipe K opening into the return-pipe F. The valve H may be fitted to the pipe connecting the tank C to the top radiator of the system.

8090. Lawson, J. April 3.



Steam-traps.—An expansion trap is provided with a ball or other valve *d* closed by the steam pressure only, and opened by co-operation with a rod *f* on the drain side, which passes out through a diaphragm *h* to engage a relatively fixed abutment *g*. Excessive motion of the diaphragm is prevented by stops *n*, *o*. In a modification, the rod *f* is divided, the button-shaped ends abutting on the diaphragm. Opening of the valve may be assisted or retarded by a spring or by the elasticity of the diaphragm, which may be of metal, or a composition of rubber and asbestos, or other material. In the form shown, the head *a* moves laterally to the expansion tube, but the invention may be applied to traps of the axial-expansion type.

8211. Hall, J. J., and **Worswick, J.** April 4.



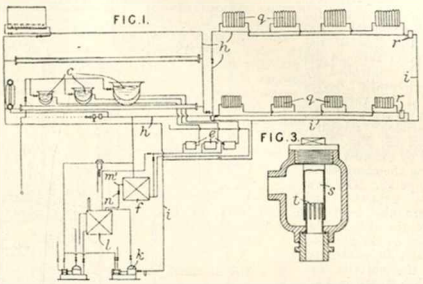
Non-conducting coverings for heat.—Pipe unions or fittings such as safety-valves used on domestic or other water-circulating boilers are protected by a sleeve A of cast iron, earthenware, or other refractory material, packed with mortar E or other suitable material. The sleeve may be of circular or other cross-section and of tapering or cylindrical form. Instead of being in one piece, it may be in two parts to facilitate application to existing unions or fittings. The parts may have engaging hooks F and projections G, or may be held together by a separate ring in two parts surrounding the sleeve and coupled by suitable projections.

8292. Lyman, P. R. V. April 18, 1911, [*Convention date*].

Non-conducting coverings for heat.—In order to prevent accumulation of water between pipes, especially pipes conveying cooling-media, and non-conducting coverings surrounding them, the space between the pipe and the covering is filled with some substance that is impervious to air and water and remains plastic without setting. Suitable substances are lubricating-grease, vaseline, and other fats. The outer insulating layer may be made of cork and may be covered with another layer of the fatty substance. The whole may be covered with roofing-paper &c., outside which may be a layer of fabric covered with asphalte, paraffin, lac, paint, &c.

8424. Avery, T. H. April 9.

Heating by circulation of fluids; steam-traps.—In a system for heating by means of exhaust steam from jacketed pans, bakers' ovens, and other steam-heated appliances, means are provided for utilizing the heat of the water of condensation. A special form of steam-trap for use with the radiators of the system is also described. In the arrangement shown, the water of condensation from the jackets of the pans *c* passes through steam traps *e* to a vessel *f*, which is connected with the supply pipe *h* of a steam-heating system. The return pipe *i* of the heating-system is connected to a pump *k*, which reduces the pressure in the system so that the water in the vessel *f* boils without further heating. An overflow pipe m^1 provided with a check valve *n* passes from the vessel *f* to the hot well *l* of the system. Each group of radiators *q* of the heating-system, instead of each single radiator, is provided with a steam-trap *r*.



The outlet from the trap *r* is governed by a valve consisting of a tube *s*, Fig. 3, fitting over a tube *t* formed with slots, so that the tube *s* covers the slots when it expands and uncovers them when it contracts. The slots in the tube *t* may be transverse instead of longitudinal and may be opened and closed as they register or not with slots in the tube *s*.

9178. Blake, L. I. April 18. *Drawings to Specification.*

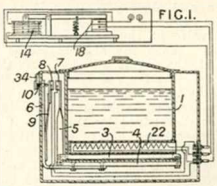
Non-conducting coverings for sound.—A sound-absorbing screen, for use in subaqueous audible signalling, consists of a mass of loosely-packed fragments or threads in free contact with the water. Wool-yarn or spun-glass may be used. If solid fragments are employed they may be interspersed with spongy material.

9487. Wurmb, T. H., and **Baumann, R.** April 22. *Drawings to Specification.*

Thermostats.—Bimetallic strips, shown curved to semicircular form, are bound with wire, which is wound on by a special machine.

9513. Kirkwood, J. C. P. April 22.

Thermostats.—An electric heating-vessel 1 has a strengthening metal bar 3 attached to one of the walls, and a slab 4 of material of low coefficient of expansion such as marble is secured to one end of the wall, the differential expansion of the parts operating a switch. The bar 3



is connected with an arm 5 carrying a contact 7, and pivoted to the slab. An insulated contact 8 is mounted by means of a spring 9 and bracket 6 on the slabs, and is adjusted by means of a screw 10 with a pointer 34 moving over a scale. When the temperature is excessive, the contacts 7, 8 close the circuit of an electro-magnet 14, which opens the circuit of the heating-resistance 22 at the main switch 18.

9739. Bassford, W. K. April 28, 1911, [*Convention date*].

Thermostats.—In vaporizing-apparatus for internal-combustion engines, the flow of exhaust gases through the heater is controlled by a thermostatic device actuated by variations in temperature of the combustible mixture. The coil 25, Fig. 1, is heated by exhaust gases entering the chamber 23 by a pipe 22. The flow of the exhaust, and therefore the temperature of the coil, is determined by the position of a valve 43, controlled by a thermostatic device, that shown in Fig. 1 comprising cylinders 53, 54 connected to the engine cylinder or to a compressed-air supply by pipes 47, 48, provided with non-return valves 49, 50 and electrically-operated valves 51, 52. The pistons 55, 56 are connected by a rod 57, which actuates the valve 43 through an arm 45 and carries a pin 63 which actuates the valves 58, 59 through an arm 60 and rods 61, 62. The arm 45 moves over insulated segments 71, 76 forming parts of circuits for actuating the valves 51, 52, such circuits being made and broken by the thermal expansion or contraction of fluid contained in a closed tube A inserted in the inlet pipe 21, the tube also containing mercury. Assuming that the temperature of the mixture falls, the mercury completes a circuit through the valve 51, which will open and allow pressure-fluid to actuate the piston 55, which is forced outwards so as to close the valve 43, thus causing the mixture to be heated. When the arm 45 moves off the segment 71, the circuit is broken, and the valve 51 is closed. As the rod 57 descends, the pin 63 opens the valve 59 so as to prevent excessive back pressure, and at the end of the stroke the arm 60 is disengaged by the pin. A similar series of operations, but in which the arm 45 is raised, takes place on a rise in temperature. In a modification, the piston-rod 57 and pin 63 are replaced by a toothed rack and quadrant. The valve 43 may also be actuated electrically as shown in Fig. 4, in which an electric motor 100 is mounted on the valve spindle, the motor being controlled by a double-throw switch B consisting of two blades 102, 103 connected by insulating blocks 104, 106 carrying armatures for the electro-magnets shown diagrammatically

FIG. 1.

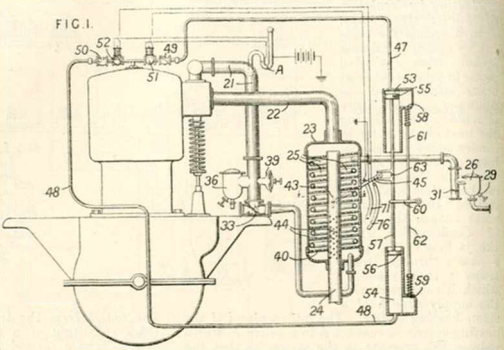
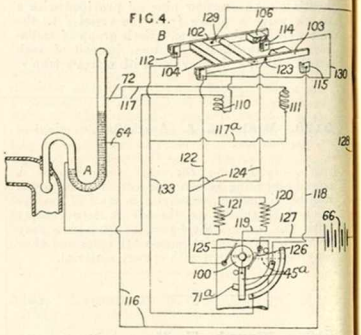


FIG. 4.

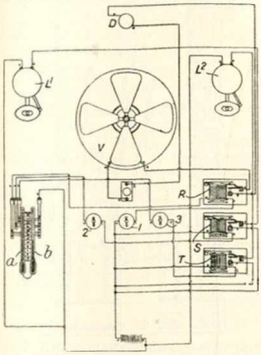


at 110, 111. As the temperature of the mixture rises, the mercury at A connects the terminals 64, 72, thus exciting the magnet 111 and pulling down the blades which now make contact at 114, 115, and close the motor circuit. The motor is thus rotated until the arm 45^a moves beyond contact 71^a, thus opening the valve 43 and reducing the temperature. On a fall of temperature, the motor is actuated in the opposite direction.

10,251. Voigt, J. A. April 30.

Thermostats.—In an automatic electrically-operated apparatus for cooling a magazine or other compartment, one or more contact thermometers *a*, *b* are provided with wire contacts fused in at different heights so as to be closed successively when the mercury rises. These

contacts are connected through switches 1, 2, 3 to relays R, S, T. When the relay R is operated, the circuit of a dynamo D is closed to drive the motor of a fan V, whereby hot air



is exhausted from the compartment. If the temperature continues to rise, alarm bells L^1, L^2 are actuated successively by means of the relays S, T.

10,288. Goold, W. T. May 1.

FIG. 2.

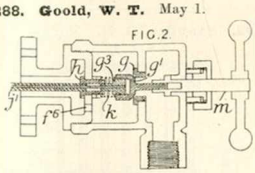
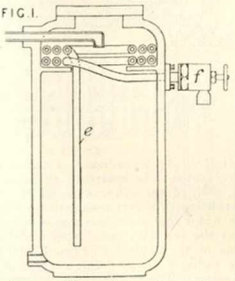


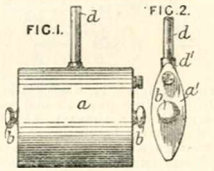
FIG. 1.



Steam-traps.—The outlet valve of a steam-trap is opened inwards against the steam-pressure by differential expansion of two strands of dissimilar metals forming a cable. In the trap shown in Fig. 1, the cable consists of inner and outer strands, secured together at the end remote from the valve and arranged in a coiled tube *e* leading from the bottom of the trap casing to a valve-box *f*, shown in section in Fig. 2. The inner strand j^1 is secured to a block g^3, screwed into the valve g^1, and the outer strand is secured to a block *h*, rigidly connected to the valve seat *g*. The valve may be forced against its seat by a spring *k*. The valve has a square shank which may be turned by a key *m* to adjust the valve on the block g^3. Water passes from the main casing to the valve-box by a passage or passages f^6.

10,312. Johnson, T. May 1. *No Patent granted (Sealing fee not paid).*

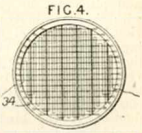
FIG. 1. FIG. 2.



Bed-warmers.—Relates to bed-warmers with an earthenware or like hot-water receptacle and a detachable handle, and consists in making the receptacle of a special form as shown. The receptacle *a* is of a flattened elliptical form in cross-section. The ends a^1 are flat and the corners are rounded off. Knobs *b* are attached to the ends, and its handle *d* is inserted in a screwed socket d^1 at the edge.

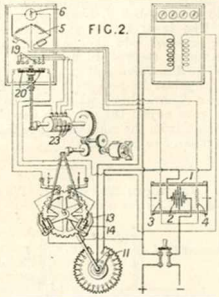
10,454. Thomas, C. C. May 12, 1911, [*Convention date*].

FIG. 4.



Thermostats. — In a steam or gas meter of the type described in Specification 30,405/09, [*Class* 54, Gas distribution], in which the gas passes an electric heater supplied with energy at a known rate, the temperature of the gas before and after heating being determined, the amount of heat imparted to the gas is now automatically regulated so as to maintain substantially constant either the heat supply or the temperature change, and the gaseous flow is calculated from the other factor. As shown, gas passes along a pipe 1 containing an electric heater 2, before and after which are electric thermometers 3, 4 connected to apparatus for keeping the temperature rise constant. The thermometers are connected in a wheatstone bridge 5, the galvanometer needle

6 of which is in mid-position when the predetermined temperature difference is maintained, but which when deflected is intermittently clamped between contacts 19, 20 to energize one



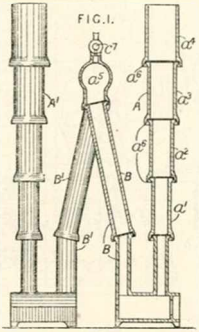
of two electro-magnets 14, which attracts a continuously oscillating pawl 13 and moves the contact-arm 11 of a rheostat controlling the current through the heater 2. The current to the electro-magnets passes through contact-strips 23 of different lengths on a continuously rotating drum, the arrangement being that the pawls are attracted for longer periods for a greater deflexion of the needle. Fig. 4 shows the thermometric resistance wire mounted on a grid 34.

10,546. Akt.-Ges. für Patentierte Korksteinfabrikation und Korksteinbauten vorm. Kleiner & Bokmayer. May 18, 1911, [*Convention date*].

Non-conducting coverings for heat.—Cork insulating blocks are formed from particles of cork and pitch &c. by charging a pervious mould with the comminuted cork, which may be previously dried, and dipping it into the binding-material. To remove excess of binding-liquid the operation is carried out in a heated vessel with successive applications of pressure and vacuum. Denser blocks are produced by compressing the cork before or after the introduction of the binding-material, one of the mould walls being made movable. To facilitate the removal of the blocks, the mould is provided with a removable lining. Reinforcements of wood, plain or corrugated iron, millboard, &c. may be inserted before the introduction of the pitch or before charging the mould.

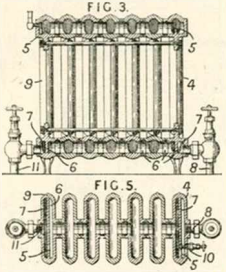
10,821. Cuming, A. J. Roach-. May 7.

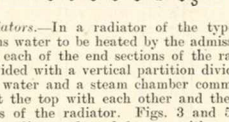
Radiators.—Safes and other chambers are, according to the Provisional Specification, heated by means of an apparatus composed of earthenware or like pipes. The pipes a^1, a^2, a^3, a^4 are vertically arranged to form columns A, A^1, and are of increasing diameter, as shown,



with lips a^6 to cause moisture to drop clear of the pipes below. The pipes communicate by pipes B, B^1 with a chamber a^5 fitted with an air-valve c^7. The heating-fluid may pass through pipes disposed within the apparatus which may be filled with brine, sand, &c.

11,492. Stauffer, S. D. May 14.





Radiators.—In a radiator of the type that contains water to be heated by the admission of steam, each of the end sections of the radiator is provided with a vertical partition dividing it into a water and a steam chamber communicating at the top with each other and the other sections of the radiator. Figs. 3 and 5 show such a radiator adapted for use with a double pipe system. The end sections 4, 9 are divided by partitions 5 into chambers 6, 7. The chamber 7 of the section 4 is connected to the steam-

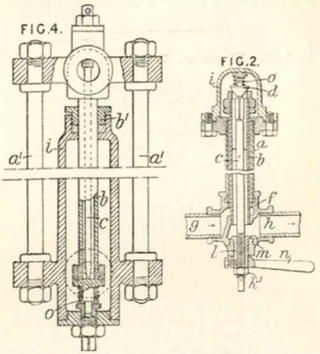
inlet 8, and the chamber 7 of the section 9 to the outlet 11. The chambers 6, 7 communicate at the top as shown, and the chambers 6 communicate in the ordinary way with the interior of the other sections of the radiator. A draining-valve 10 may be provided in the partition 5 of the section 4. A radiator for a single-pipe system may contain only one divided section.

11,665. Herdman, G. A. May 16. *Drawings to Specification.*

Non-conducting coverings for heat.—Pipe covering slabs and the like made from granulated cork, and if desired, a binder, are reinforced with woven wire net, arranged in one or more layers within the substance of the material. The cork is filled into a mould, a binder such as bitumen or casein being added if there is not sufficient natural resin in the cork, and layers of woven wire are incorporated during the operation. The block is pressed and heated in the mould.

11,697. Paterson, R. H. May 16.

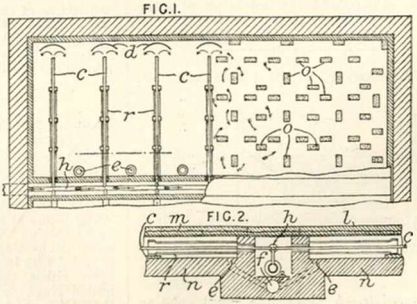
Steam-traps.—A steam-trap comprises an expansion tube, one end of which forms a valve-seat, a relatively inexpansible inner rod which holds the valve from its seat when the tube contracts, and an outer casing connected to one end of the expansion tube. In the trap shown in Fig. 2, an outer tube *a*, expansion tube *b*, and non-expanding rod *c* are secured to a base *f*, the outer tube being connected to an inlet *g* and the expansion tube to an outlet *h*. The rod *c* is adjustable in a screwed bushing *l*, and may be locked by a nut k^1. The bushing *l* may be turned to raise the valve temporarily by a handle *n* and brought back against an abutment *m*. The tube *a* is closed at the top by a cap *i* having guides for the valve *d* which is closed by a spring *o*. The expansion tube *b* is preferably of brass, and the outer tube *a* of iron. The rod *c* may be built up of one aluminium



and two iron parts, or may be of hard wood encased in metal tubing, or may be in two telescopic or other adjustable sections set by a wedge. In a modification, the rod *c* is screwed directly to the base *f*. In another modification, having a disk valve, the expansion-tube is connected to the inlet and the outer tube to the outlet, and the closing-spring may be adjusted. In another modification, shown in Fig. 4, the expansion tube is secured at the top to rods a^1 and passes through a gland b^1 in the outer tube *i*, which is secured to the other end of the rods. The tube *i* is connected to the inlet and the tube *b* to the outlet.

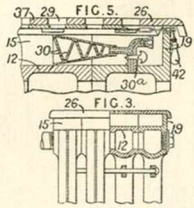
12,002. Barwise, S. *Nov. 21.*

Radiators. — Relates to construction of floors suitable to the method of heating buildings by forming the floors hollow and passing steam into them. The steam enters the floor by a central pipe *h*, and is directed by branch pipes *c*, protected for the greater part of their length by earthenware pipes *r*, against curved baffles *d*, which distribute it through the floor. The water of condensation passes through holes *e* to a drain-pipe *f*. The upper layer *l* of the



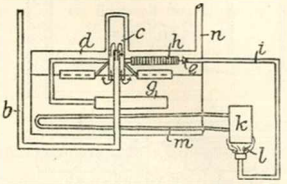
floor is made as thin as possible and is supported by blocks *o* constructed of reinforced concrete, the metal *m* of which assists in conducting the heat into the room. The lower part *n* is made thick to hinder the escape of heat.

12,147. Warren, J. L. May 22.



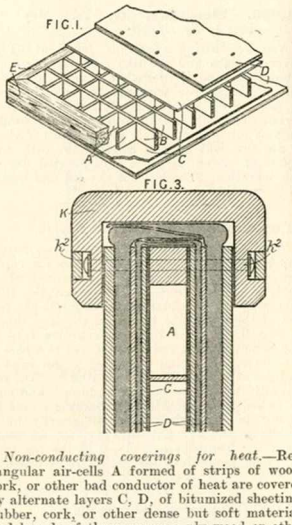
Radiators.—In radiators made of cast sections, the sections are formed at their upper ends with flanges which, when the sections are assembled, form a pan which contains water to moisten the air of the room. Means are provided for keeping the pan full of water. The bottom of the pan is formed by the tops 12 of the sections, the sides by the flanges 15 and the ends by flanges 19 formed on the end sections only. The pan is provided with a perforated cover 26. In a water-heated radiator, the pan is kept filled by a valve controlled by a float and opening from the radiator into the pan. In a steam-heated radiator the pan is kept filled by the device shown in Fig. 5. A pipe 30^a from the radiator leads to a conical nozzle 29 provided with perforated partitions 30. Steam condenses in the nozzle 29 and flows into the pan. The size of the perforations in the cover 26 may be regulated by a sliding perforated plate 37 operated by a chain and handle 42. Another form of cover is not perforated, but is separated from the body of the radiator by legs. A detachable pan may be placed in the pan formed by the radiator.

12,369. Mayer, M., and **Holwech, W.** May 24.



Thermostats.—A thermostat for regulating the temperature of the hydrocarbon in a carburettor comprises a submerged vessel *g* containing a liquid such as toluol and communicating with an expansible chamber *h*, which carries a valve *e* by which the gas supply to the heater *k* is controlled.

13,287. Cuming, A. J. Roach-. June 5.



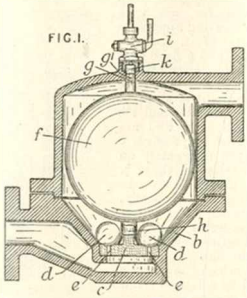
Non-conducting coverings for heat.—Rectangular air-cells A formed of strips of wood, cork, or other bad conductor of heat are covered by alternate layers C, D, of bitumized sheeting, rubber, cork, or other dense but soft material, and boards of three or more ply wood or other stiff material. The cells are enclosed in a frame E to form a slab, or panel. Grooved pieces K pass over the edges of the frame, and are pressed against the face of the slab by bolts k^2.

13,685. Kiechle, G. June 11. *Drawings to Specification.* [*Addition to* 15,745/11, *Class* 29, Cooling &c.]

Heat-storing apparatus.—In cooking-apparatus of the kind in which the food is placed in suitable receptacles, together with heat-accumulating bodies at a higher temperature, within a heat-retaining chamber having non-conducting walls, the heating elements consist of iron rings provided with lugs whereby they may be centred upon either the cooking-receptacles, other heated rings, or a filling cylinder for raising them above the base-plate.

14,259. Maurer, R. June 18.

FIG.1.



Steam-traps.—A steam-trap is actuated by a float *f* to the bottom of which is fixed a member, such as a flared tube *h*, adapted when the float rises to displace a number of gravity valves, such as balls *d*, arranged symmetrically round the member. The trap-casing has a conical base *b* in which rests a valve-seating plate *c* having a number of holes *e* with cupped ends in which the balls *d* rest. The top of the float is provided with a stem *g* over which is passed a piston g^1 which works in a sleeve *k*. The float may be raised to blow through the trap by opening a snifting-valve *i* to relieve the pressure above the piston. The piston and sleeve may be replaced by others of different diameter for working at different pressures.

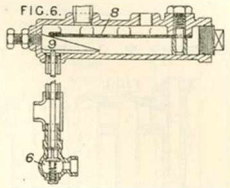
14,430. Thompson, W. P., [*Trockenschrank- und Maschinenbau-Industrie Friedrichschafen W. G. Mader & Co.*]. June 20. *Drawings to Specification.*

Non-conducting coverings for heat.—A material used in making drying-chambers, trays, &c. consists in a sheet of insulating-material such as laminated asbestos coated electrolytically with gold, aluminium, &c.

14,435. Brown, A. W. June 20.

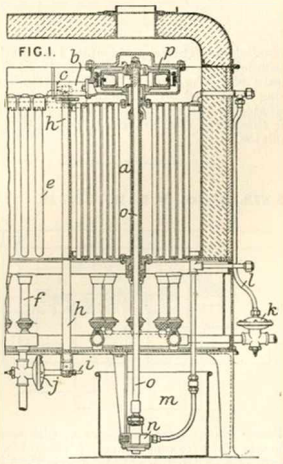
Thermostats.—A steam-generator, constructed so that the steam-producing surface varies to a considerable extent with alteration of the water level, may be provided with thermostatic apparatus for regulating the supply of feed water from a pressure supply. Water flows from the main to the boiler or oppositely according to whether the pressure in the boiler is less or greater than in the main. A valve 6 in the feed-pipe is regulated by a bimetallic expansion strip 8, pressing against an adjustable wedge 9 resting upon the valve-spindle, so as to open the valve when contact with steam raises the temperature of the strip.

FIG.6.



15,061. Lamplough, F. June 27.

FIG.1.

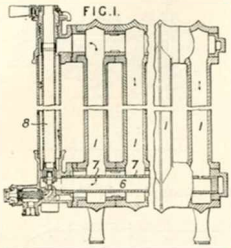


Thermostats.—Apparatus for producing superheated steam at about atmospheric pressure is provided with thermostatic means for automatically controlling the heating of the superheater. The apparatus shown consists of a vertical tubular boiler *a* and a superheater formed of sinuous tubes *e* connected to horizontal headers *b*, *c*, one of which opens into the boiler steam space. The supply of gas to the burners *f* beneath the superheater is controlled by the expansion and contraction of the header

c. The end of the header bears against an arm on a vertical shaft *h*, on the lower end of which is a lever *i* actuating the fuel-supply valve *j*.

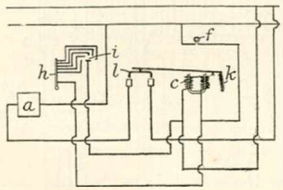
15,163. Barty, T. June 28.

FIG.1.



Radiators.—The separate units 1 are each in communication with a common supply-pipe 6 by means of perforations 7, the supply of steam being controlled by a thermostatic device 8, actuated by the temperature of the steam flowing through it after traversing the units of the radiator.

15,178. Price, S. L. R. June 28.

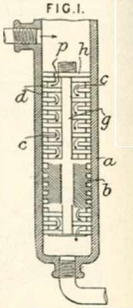


Thermostats.—A thermometer *h*, with several contacts which can be connected separately by means of a switch *i*, is shunted across the winding of an electro-magnet *c* controlling the main switch *l* of a heater *a*, so that, when the temperature is excessive, the electro-magnet is short-circuited and the switch opened by means of a spring *k*. The electro-magnet is connected in series with a high resistance *f* across the mains. The temperature to be maintained can be varied by means of the switch *i*, and sparking on the thermometer is reduced.

Reference has been directed by the Comptroller to Specifications 4610/94, 1704/04, 15,898/11, *and* 15,899/11.

15,290. Abels, F. July 1.

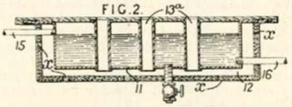
FIG.1.



Steam-traps.—A trap adapted for use with steam-heating apparatus consists of a tubular vessel *a* and a fixed core *b* having circumferential grooves *d* which are left incomplete so as to form a longitudinal rib *g* on the core and are connected by passages *e* arranged alternately on either side of the rib. The groove may be arranged helically. Condensed water enters the grooves by a hole *p* in an adjustable disk *h*, or through a conical hole which is partly closed by a lateral screw valve having a conical end. The head of the screw may be enclosed by a steam-tight cover and slotted to receive a screw-driver, or the screw spindle may extend through a stuffing-box and carry a hand-wheel.

15,538. Gibbs, W. A. July 3.

FIG.2.

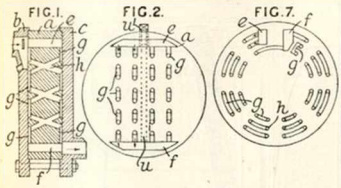


Foot-warmers.—Relates to foot-warmers to be placed in motor-vehicles and heated by water circulating through the water-jacket of the engines, air passing through the foot-warmer to the car. The foot-warmer consists of a tank 11 fitted with inlet and outlet pipes 15, 16. The tank 11 is enclosed in a casing 12 provided with air inlets *x*. Tubes 13a pass through the tank 11 from the casing 12 to the interior of the car. Air is heated in the casing 12 and the tubes 13a, and thence passes to the car. A foot-warmer may be placed under each seat and the water passed through them in series. From the foot-warmers, the water passes to the radiator.

15,637. Marks, E. C. R., [*Schütze, E. M.*]. July 4.

Steam-traps.—A trap without moving parts comprises a body having passages, some of which extend transversely through it and communicate with other passages on its surface. In the trap shown in Fig. 1, a block *a* has intersecting passages *h* joined by grooves *g* closed by plates *b*, *c*. As shown in Fig. 2, there may be several parallel sets of passages, each set communicating at the top and bottom with inlet and discharge chambers *e*, *f*. The chambers *e*, *f* are directly

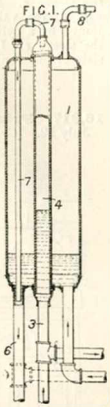
connected by a duct u, closed by a screw plug u^1 when the trap is in use. Some of the connecting grooves may be closed by screw plugs, or some of the transverse passages may themselves



be plugged. In modifications, the passages cross without intersecting or merely touch one another. In another modification, the transverse passages are perpendicular to the sides of the block. In another form, the connecting grooves are arcs of a circle or of concentric circles as shown in Fig. 7. A trap may comprise several blocks superposed, with their corresponding grooves either displaced from or registering with one another; in the latter case the grooves may be separated by disks; the passages may be connected in series or parallel. Such a trap may be mounted in a closed casing having a baffle at the inlet. In another modification, the block containing the passages is conical and fits into a conical casing.

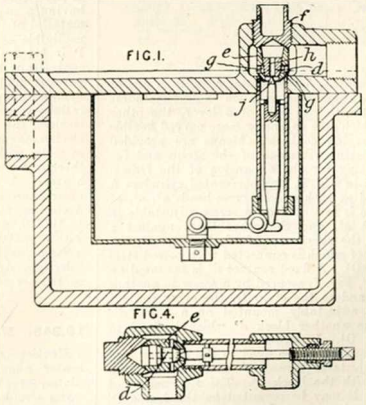
15,654. Freer, W. July 4.

Heating by circulation of fluids.—In hot-water heating systems in which the water from the boiler is led into an expansion chamber so as to obtain a head above that in a vessel connected with the return pipe of the system, the expansion chamber 4 is made as an extension of, and slightly larger in sectional area than, the flow pipe 3 and small in area as compared with the area of the return vessel 1. A siphon pipe 7 conducts any steam in the chamber 4 to the pipe 6, which leads from the vessel 1 back to the boiler. The pipe 7 may be extended and utilized for warming the upper part of high buildings, such as churches. A pipe 8 carries off any steam in the vessel 1. In a modification, the chamber 4 is located outside the vessel 1.



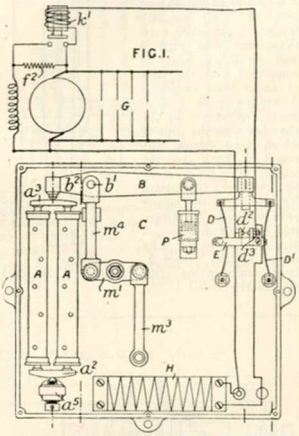
15,748. Ogden, J. E. L. July 5.

Steam-traps. — In a steam or air trap or like apparatus, which may be of any type, but is shown in Fig. 1, as of the bucket type, the discharge valve comprises a conical plug d having a passage h therethrough and fitting into a coned sleeve e having outlet passages g. The valve is normally held on to its seat by the steam pressure, but on accumulation of water, a rod j rises, first closing the central passage h and then raising the valve slightly. The pressure above the valve is thus relieved, and the valve rises to the upper end of the sleeve e, where it is maintained by the rush of water until all the water is expelled. In a modification operated by a closed float,

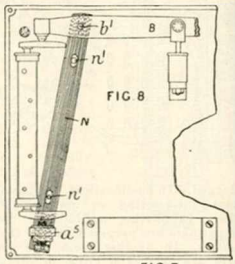


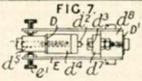
the valve moves horizontally, and a hand-operated valve is added on the fitting *f* carrying the sleeve *e*. In an expansion trap shown in Fig. 4, the valve consists of two coned parts joined by a cylindrical part *d* fitting loosely in the sleeve *e*. In a modification the valve consists of one conical and one cylindrical part.

16,317. Prim, A. W., and **Roper, F. W.** July 12. [*Cognate Application*, 27,780/12.]



Thermostats.—A thermostat consists of one or more expansion members such as zinc cylinders connected with one arm of a lever, the other arm of which acts on one or more curved flexible strips carrying contacts. Means are provided for preventing vibration of the strips and for compensating for the expansion of the frame. As shown in Fig. 1, two perforated cylinders A are joined at each end by cross-heads a^2, a^3, of which one is mounted on a screw adjustable in a bracket a^5, and the other bears against a screw on the short arm b^2 of the lever B, the long arm of which is connected with bowed steel strips D, D^1. A fixed contact d^2 is mounted on a block d^4, Fig. 7, secured by a screw to another block d^5 and to the strip D, the other contact d^3 being adjustably mounted on a block d^7, secured to another block d^8 which is fixed to the strip D^1. In order to prevent vibration, two flat springs E are fixed to the block d^5 and carry adjustable screws e^1 making a sliding contact with the block d^5. The fulcrum b^1 of the lever B may be mounted on the frame C, or it may be mounted on a cast-iron rod m^4 pivoted to a lever m^1, with which is also connected an aluminium rod m^3, the arrangement being such that the fulcrum b^1 is fixed relatively to the support a^5. In a modification, the



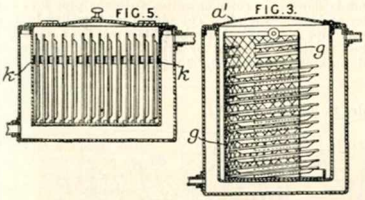


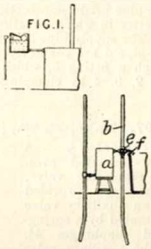
fulcrum is placed near the bracket, and the arm b^2 is connected by a rod with the cross-head a^3; or a compensated connecting-rod may be interposed between the cross-head and the arm b^2. In the arrangement shown in Fig. 8, the fulcrum is mounted on a bar N held in position by studs n^1 fitting in slots, the bar being corrugated to provide a large surface so that the bar may change temperature at the same rate as the cylinders. The bar is made of a material having a smaller expansion coefficient than the material of the cylinders, and an alloy having a negligible expansion may be used. A dash-pot P is fitted to the lever. The thermostat may control any heating, cooling, or ventilating apparatus, and is shown for use in controlling a dynamo supplying current to heaters G in a railway-wagon. When the temperature is excessive, the contacts close the circuit of an electro-magnet k^1, which switches a resistance f^1 in series with the field winding of the dynamo, thereby reducing the current supplied to the heaters. A non-inductive resistance H is connected across the contacts to prevent sparking. According to the first Provisional Specification 16,317/12, a single bowed strip may be fitted with a contact on each side, and a cylinder and a strip may be placed on the same side of a fulcrum. An electric condenser may be connected across the contacts.

16,345. Nash, G. D. July 12.

Heating-apparatus.—A hot-water jacketed heater adapted for the reception of towels, plates, or other articles is inserted in a hot-water circulation-system in such a manner that, when the hot-water outlet from the system is

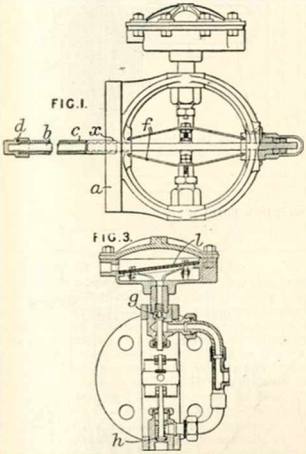
open, the communication with the heater is closed, and vice versa. A three-way cock *e*, Fig. 1, in the rising-main *b* of a circulation-system allows water to pass either to the heater *a* or to the outlet *f*, the circulation of water through the main being maintained in both cases. The heaters shown consist of water-jacketed receptacles provided with hinged





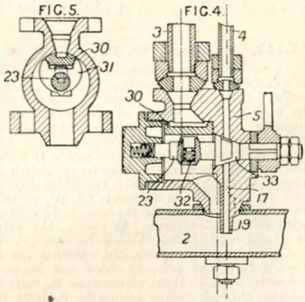
covers. When the heater is used for warming plates, a cylindrical carrier *g*, Fig. 3, cut away on one side to allow the plates to be inserted laterally may be inserted in the heater, or the plates may be supported by transverse bars *k*, Fig. 5.

16,414. Jennings, F. W. July 13.



Thermostats.—A pilot-valve apparatus for use with fluid-pressure actuated dampers or stop-valves, controlling the supply to radiators and the like, comprises a pair of lift valves *g*, *h* actuated by an expansion device acting through spring toggle-links *f*. The expansion device comprises a brass tube *c* fixed to the casing at *x* and secured to a steel rod *b* by a cap *d*, the steel rod being adjustably connected at its free end to the spring toggle links. The valve *g* controlling the supply of actuating-medium is fitted with a strainer *l*.

16,697. Bousfield, J. E., [*Pintsch Akt.-Ges., J.*]. July 17.

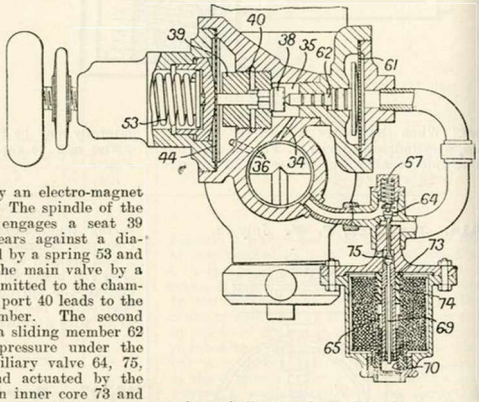


Heating buildings, ships, and vehicles.—In an arrangement for heating by steam, especially applicable to the heating of railway carriages,

in which the steam is taken from a pipe to which the water of condensation &c. is returned, the drain-pipe is furnished with a nozzle which projects radially into the steam pipe as far as the centre thereof, so that the steam in the steam pipe produces a suction in the drain-pipe, no matter in which direction the steam is flowing. The supply pipe 3 to the radiator and the drain-pipe 4 are connected to the steam pipe 2 through a fitting 5, which is attached to the pipes 2, 3, 4 by clamping-bolts and packing-rings. Through the fitting 5 extends a passage 17 from the pipe 4 to a nozzle 19 projecting into the middle of the pipe 2. The passage 17 is controlled by a conical plug cock 33 mounted on a spring-pressed spindle 23 and arranged as a three-way cock, so that the pipe 4 may be put in communication with the pipe 2 or opened to the air. The pipe 3 is controlled by a valve 30 pressed against its seat by a spring 32 and operated by arms 31 on the spindle 23. The valves 30, 33 may be dispensed with.

16,897. Lake, H. W., [*Collin Valve Co.*]. *Oct. 18, 1911.*

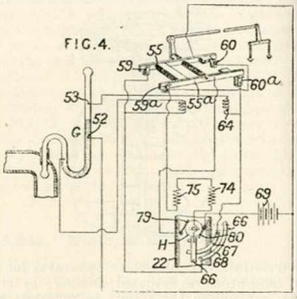
Thermostats. — A piston-actuated pressure-regulating valve, of the type provided with an auxiliary valve 38 actuated by a spring-loaded diaphragm 44, has the auxiliary valve provided with a second actuating-diaphragm 61 controlled from a distant point by means of a two-way valve actuated by an electro-magnet controlled by a thermostat. The spindle of the auxiliary valve 38, which engages a seat 39 screwed into the casing, bears against a diaphragm 44 adjustably loaded by a spring 53 and open to the outlet side of the main valve by a port 36; inlet pressure is admitted to the chamber 35 by a port 34, while a port 40 leads to the main valve actuating chamber. The second diaphragm 61 acts through a sliding member 62 and is actuated by inlet pressure under the control of a two-way auxiliary valve 64, 75, loaded by a spring 67, and actuated by the electro-magnet, which has an inner core 73 and an outer protecting case of magnetic material. The armature 65 is hollow and is provided with a cage 70, the lower end of which engages the valve spindle 69, which slides in a brass guide-bushing 74.



17,142. Bassford, W. K. July 29, 1911, [*Convention date*].

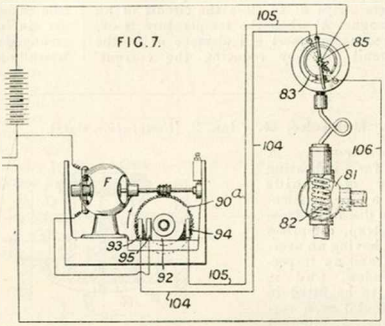
Thermostats.—In vaporizing-apparatus for an internal-combustion engine, the flow of hot exhaust-gases through a pipe 22 is controlled by a valve, the amount of opening of which depends upon the temperature of explosive mixture passing through a supply pipe. The valve is actuated by an electric motor H under the control of a thermal mercury switch G placed in the supply pipe. The valve has an arm 66 moving over segments 67, 68, so that in its extreme positions the arm is in contact with only one segment. As shown, the valve is closed, and switch blades 55, 55^a are in contact with terminals 59, 59^a. With a rise in temperature, the mercury rises and connects contacts 52, 53, so that current from the battery 69 flows through electro-magnet 64, fields 74, 75, and the motor armature. The switch blades thus engage terminals 60, 60^a, completing a circuit through the motor fields 75, 74 in a direction to cause the arm 66 to move so as to open the valve. On a fall of temperature, the switch is brought to its former position again, and the valve is closed.

FIG. 4.

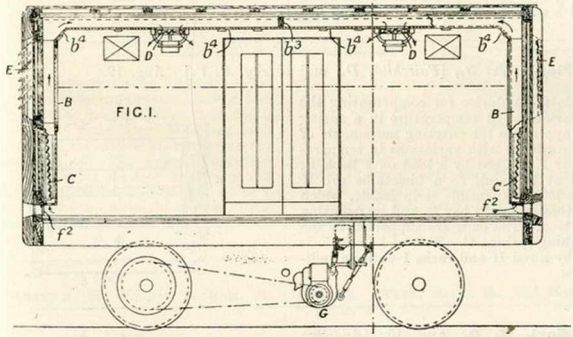


17,148. Bassford, W. K. Feb. 3, [*Convention date*].

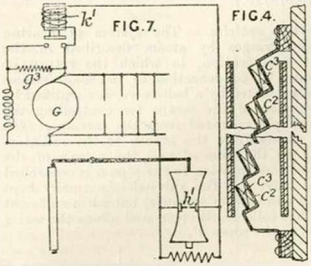
Thermostats. — In a fuel-supply system for an internal-combustion engine wherein the temperature of the mixture is to be kept constant, a closed tube 82 in the mixture pipe 81 is connected with a Bourdon tube 83 or with a U-tube containing mercury, the pressure in the same varying with the temperature of the mixture. The mercury or the pointer 85 may close either of two circuits through a rotary switch 90^a to an electric motor, which operates a controlling-valve; the rotary switch is driven by the motor itself, so that only a half-turn is possible at a time.



17,517. Elders & Fyffes, Prim, A. W., and **Roper, F. W.** July 29.



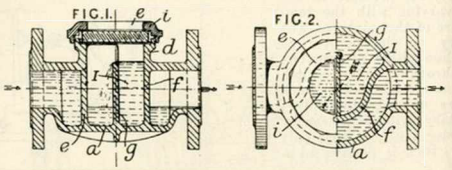
Thermostats.—In apparatus for heating and cooling railway freight vans, the vans are provided with air-conduits having electric heaters supplied with current from a dynamo driven from an axle, the dynamo being controlled by one or more thermostats. As shown in Fig. 1, the van is heat-insulated, and the heaters C are arranged in a conduit B, air being admitted at the bottom and circulated by means of fans D. A partition b^3 divides the conduit. Air may also pass through adjustable openings b^4. Louvers E admitting air to the conduit, or to the van directly, and doors f^2, are provided at each end for controlling the supply of air during warm weather. The louvers E and fans D may be controlled thermostatically. The dynamo G is connected with means for maintaining a constant potential, and is controlled



by a thermostat of the type described in Specification 16,317/12 in which the expansion of a rod causes strips h^1 to close the circuit of an electro-magnet k^1 when the temperature is excessive, so as to insert a resistance g^3 in the field circuit, thereby reducing the current. Several thermostats may be used in series. The heaters are mounted on a zigzag frame c^2 in an iron casing. In a modified form of conduit for use in continental trains, the heaters are arranged at the sides and the conduits extend laterally across the top of the van.

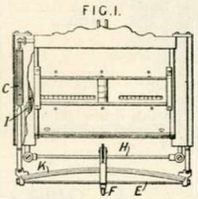
17,943. Schacke, G. Jan. 2, [*Convention date*].

Steam - traps. — A device for indicating the flow of liquids through a pipe, particularly the discharge from a steam-trap, comprises a casing having an overflow sill and an inspection window, and is adapted to be fitted in an horizontal or a vertical pipe, a different part of the casing forming the sill in the two cases. In the apparatus shown in elevation and plan in Figs. 1 and 2 respectively, water flows between the casing *a* and a curved tongue *e* to a chamber I, over a rib *g*, and out between the casing and a curved tongue *f*. The casing has a screw-flange *d*, to which a window *i* is clamped. When the device is fitted to a vertical pipe the edge of one of the tongues *e*, *f* forms the sill. The device may also be used with the window *i* vertical in a horizontal pipe.



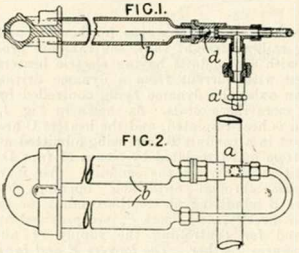
18,532. Boult, A. J., [*Fairchild, D.*, and *Haxby, R. V.*]. Aug. 12.

Thermostats.—A device for compensating the effect of variations of temperature in a spring balance is applicable for effecting movements of parts in accordance with variations in temperature. A bar E, sagged by a load on a hook F, is clamped at the ends to a bimetallic arc K having the more expansible strip inside, which varies the tension in the bar E, and its deflexion under the load. The ends are supported by the usual weighing-springs C. The load hook F is connected by a rod H and racks I with an indicating-drum.



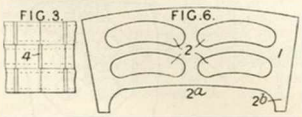
18,753. Earl, H. D. Aug. 15. [*Addition to* 18,572/10.]

Heating vehicles. — The system of heating railway-carriages by steam described in the parent Specification, in which the return of the water of condensation to the main steam-pipe is regulated by a ball valve, is simplified by the omission of the means for controlling the steam-supply operated from the carriage. The steam passes from the pipe *a* to the radiator-pipe *b* by the pipe a^1 and the return of the water of condensation to the pipe *a* is controlled by the valve *d*. The valve *d* is normally kept closed by the steam pressure, but when sufficient water has collected it opens and allows the water to pass to the pipes a^1, *a*.

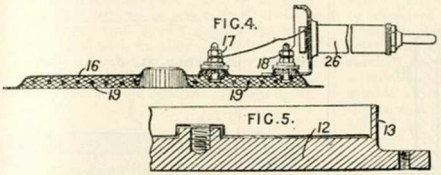


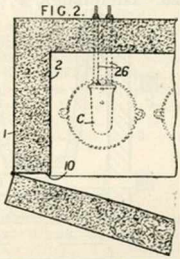
18,899. Alphons Custodis Chimney Construction Co., and **Mordey, W. M.** Aug. 17.

Non-conducting coverings for heat.—Blocks 1 for the construction of a non-conducting covering for boilers, pipes, &c. have three or more superposed air spaces 2, 2^a, one 2^a being formed by narrow ribs 2^b supporting the block. The air spaces 2 may extend across the block instead of being in two parts as shown. In mounting, adjacent blocks may be turned at right-angles so that the air spaces in each are closed by the smooth sides of the next block; or tiles 4 may be inserted as shown in Fig. 3, in staggered arrangement, or after each block or each two blocks.



19,064. Piper, H. J., and **Bridgwater, R. A.** Aug. 20.



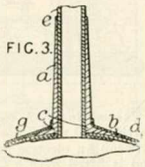


Heat-storing apparatus.—An electric oven, Fig. 2, comprises outer and inner casings 1, 2 separated by lagging and heating-elements C having metal parts which store sufficient heat to perform cooking operations after the current has been switched off. The oven is provided with a double-walled lagged door, the inner wall being of resilient material and closing on to a rim 10 so as to form an air-tight closure. The heating-element shown in Fig. 4 is secured to a thick circular cast-iron plate 12, Fig. 5, having a rim 13, by a central screw which also secures a cover extending over the terminals 17, 18.

Reference has been directed by the Comptroller to Specification 20,639/09

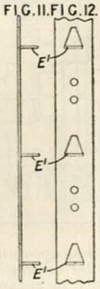
19,437. Martyn, H. C., and **Arbon, A.** Aug. 24.

Hot-water bags.—The joint between a flexible bag *d* and a tube *c* is strengthened by providing a sheath *c* of rubber or other flexible material, the tube *a* and flange *b* of which are tapered towards the angle. The flange *b* may be arranged on the inside or outside of the bag *d*. A cap *g* completes the joint. In a modification, the tube *c* is given the form of the sheath *a*, which is dispensed with.

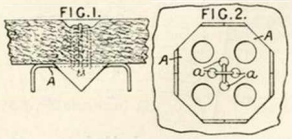


19,498. Wild, R. L. R., and **Kolkmann, F. C. H.** Aug. 26.

Non-conducting coverings for heat.—Flexible coverings for boilers, such as asbestos mattresses, are provided with metal supports which hold them off the surface of the boiler, thus leaving an air space, the supports being so arranged as not to interfere with the flexibility of the coverings. Figs. 1 and 2 show one form of support secured to a mattress. The support consists of a piece of metal A turned up at the corners, perforated to

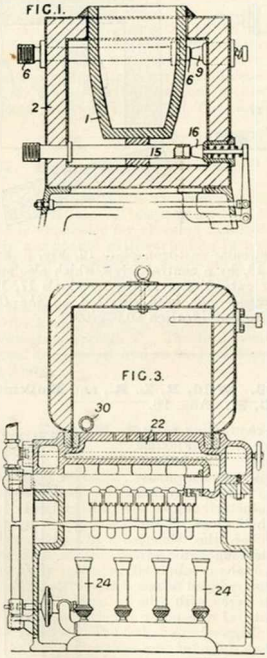


reduce weight, and secured to the mattress by wires passing through holes *a*. Figs. 11 and 12



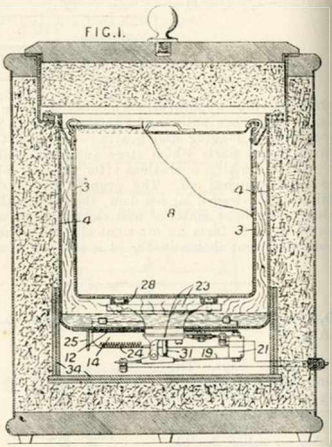
show supports in the form of long strips of metal with portions E¹ struck out and turned up.

19,526. Lamplough, F. Aug. 26.



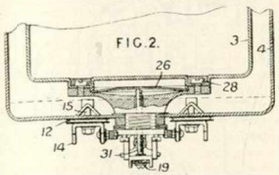
Heating-apparatus; thermostats. — In apparatus for heating by superheated vapour, particularly in apparatus used in die-casting for heating the metal and moulds, the temperature and the discharge of the vapour are regulated by thermostatic devices. Fig. 1 shows apparatus for keeping the metal or alloy in a crucible 1 fluid. The supply of superheated vapour to the heating-chamber 2 is regulated by the expansion and contraction of the inlet pipe 6 and of the heating-chamber. A valve 9 at the end of the inlet pipe closes the pipe as the chamber expands. Similarly, the outlet pipe 15 and a valve 16 regulate the discharge of the cooled vapour. In the apparatus shown in Fig. 3 for heating moulds on a hollow perforated table 22, the temperature of the vapour supply is regulated by thermostatically controlling the fuel supply to the burner 24 of the superheater in the manner described in Specification 15,061/12. The cooled vapour is discharged through a pipe 30 in a manner similar to that described above with reference to Fig. 1.

19,754. Kercher, A. J. Aug. 29.



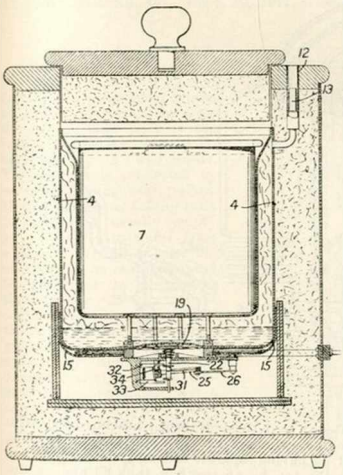
Thermostats.—A casing exhausted of air but partly filled with vaporizable liquid is interposed between an electric heater and a cooking-vessel, and is fitted with a diaphragm operated by the pressure in the casing to control a switch. In the arrangement shown, a casing with double walls 3, 4 is adapted to receive a cooking-vessel 8 and has a diaphragm 26 sprung into a frame 23, so that when the pressure is excessive, owing to a rise in temperature, the diaphragm springs quickly to the opposite position and moves a switch arm 19 by means of a pin 31 to open a

switch 21 against the action of a spring 24. The spring is connected with a support 25, which is secured by a fusible alloy to the wall 4, so that, if the switch fails to act, the alloy melts



and releases the spring, the arm 19 then falling by its own weight. The joints between the walls and the diaphragm are sealed by an alloy. The frame 23 is secured by screws to depressions 28 in the inner wall 3, the depressions being afterwards filled with an alloy. The heater and switch are surrounded by sheets of asbestos 34, and the whole is enclosed with heat-insulating material. Specification 8035/84 is referred to.

19,771. Kercher, A. J. Aug. 29.

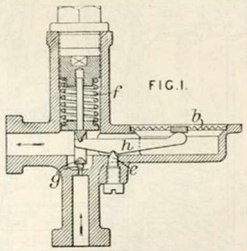


Thermostats.—A casing 4 interposed between an electric heater and a cooker 7 contains a liquid, and is provided with a valve which allows air to escape, but which expands and closes the outlet when the temperature reaches a predetermined value, a switch being operated by the pressure in the casing. The base of the casing is fitted with a diaphragm 19 bearing against a spring-pressed rod 22, which is operated by the movement of the diaphragm to engage with one of two fingers 32, 33 and release the end 34 of a lever 25 carrying the switch contact 26. A flat spring 31 causes the switch to act suddenly.

19,927. British Thomson-Houston Co., [*General Electric Co.*]. Aug. 31.

Non-conducting coverings for heat.—An intumesced alkali silicate for use as a heat insulator, preferably prepared as described in Specification 243/13, is treated with an acid, such as gaseous or dissolved hydrochloric acid or with hydrofluosilicic acid, or with a solution of metallic salt, such as a salt of aluminium, magnesium, calcium, barium, or the like in order to produce a more refractory substance (silica or an insoluble silicate) having the same form as the intumesced alkali silicate. The product may be washed to remove the soluble products of the reaction.

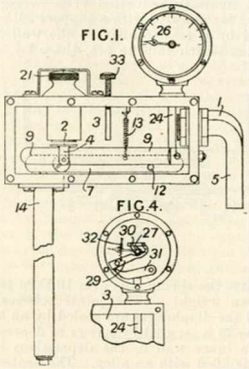
20,532. Akt.-Ges. der Maschinenfabriken Escher, Wyss, & Co. Sept. 8, 1911, [*Convention date*]. *Void.* [*Published under Section 91 of the Act.*]



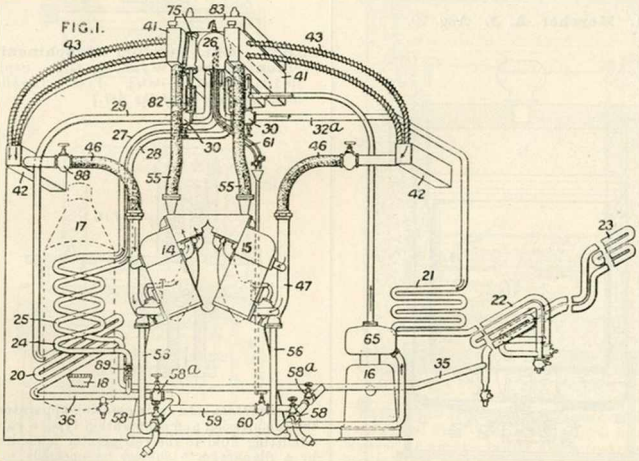
Thermostats.—In refrigerating-apparatus of the compression and evaporation type, a valve *q* admitting fluid to the refrigerator is controlled by a diaphragm *b* subject on one side to the refrigerator pressure and on the other side to atmospheric pressure, the valve being opened against the action of an adjustable spring *f* by a lever *h* mounted on an adjustable knife-edge *e*.

21,072. Hall, I. Sept. 16.

Thermostats.—A gas-valve 4, Fig. 1, operated by the differential expansion of a metal tube 14 and a rod of carbon or like refractory material, is mounted on one 9 of a series of levers placed in a gas-tight box 3 fitted with inlet and outlet pipes 1, 5. In the arrangement shown, two levers are used, the lever 9 being engaged by a pin 12 on the second lever 7. A spring 13 tends to close the valve. The valve seat 2 is adjustable by means of a head 21 with a screw. The valve may be operated by hand by means of a screw 33. A spring (not shown) holds the carbon rod in position in the tube. A temperature indicator is also mounted on the box, and has a pointer 26 operated through a series of levers 31, 29, Fig. 4, and links 30, 27, by a rod 24 resting on the lever 7. A spring 32 is provided to return the pointer 26 to the zero position. The apparatus may be used for controlling the gas supply to the melting-pots of type casting and like machines.



21,187. British Thomson-Houston Co., [*General Electric Co.*]. Sept. 17.



Heating vehicles. — In a motor-vehicle the engine-cooling system and the car-heating system are interconnected so that (1) when the engine is not working, the heating water may circulate in parallel through both the car-heating coils and the cylinder jackets and radiator, and (2) when the car needs only to be slightly heated, the engine-cooling water may be circulated in part through the car-heating coils. The engine cylinders are arranged in two groups 14, 15 having separate cooling-systems connected at the top by an overflow tank 83 and at the bottom by a pipe 59 provided with a valve 60, which is shut to disconnect the groups entirely. The two parts of the radiator are curved to conform to the shape of the vehicle roof, and

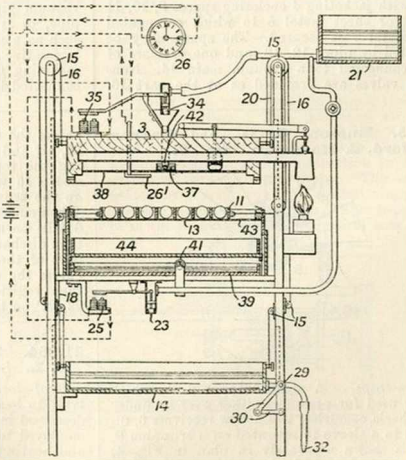
each comprises headers 41, 42 connected by tubes 43. The water leaves the header 42 by a flexible pipe 46 connected to a forked pipe 47, having branches leading to each cylinder and to the exhaust valves. Another flexible pipe 55 leads from the cylinder jackets to the header 41. A pipe 56 leads to a filling-valve 58 and the connecting pipe 59. The water level in each of the headers 41 is indicated by a float working in a chamber 75 and carrying a pointer moving over a scale 82. An auxiliary engine 16 for driving a generator or air pump is provided with a water-jacket 65 connected up to the main circuit. The heating-system comprises a burner 18 enclosed in a casing 17 and heating two coils 24, 25, each of which can be connected with one part of the cooling-system. The hot water from the coils passes up through pipes 27, 28 into a tank 26 and then down through pipes 29, 32^a, to car-heaters 20 on one side, and 21, 22, 23 on the other, and finally back to the coils through pipes 36, 35. Valves 30 connect the pipes 27, 28 with the headers 41, and valves 58^a connect the pipes 36, 35 with the pipes 56 forming the lower part of the cooling-system. Normally these valves are closed, but when open the hot water from the coils 24, 25 divides at the valves 30, one part passing through the car-heaters and the other through the headers 41; this part again divides and forms two currents passing through the radiator and the cylinder jackets respectively and meeting again in the pipes 56 by which the water returns to the heating-coils. When the car is to be heated by the water from the cooling-system, valves 89 on the pipes 35, 36 are closed and valves 88 in the pipes 46 are wholly or partly closed. The hot water from the engine will now flow from the headers 41 into the tank 26, then through the car-heaters and back to the engines. If the valves 88 are partly open, some water flows through the radiator. The water level in the tank 26 is ascertained by means of two pipes 61 terminating at different levels in the tank and provided with valves at their lower ends.

21,356. Lion, G. P. J. Sept. 19. *Drawings to Specification.* [*Addition to* 5139/12.]

Thermostats.—In apparatus for carburetting air with naphthalene, for internal-combustion engines, the tanks are heated by Bunsen burners, the supply of fuel to which is controlled by cocks actuated by connexion with diaphragms acted on by expansion of air, as described in the parent Specification.

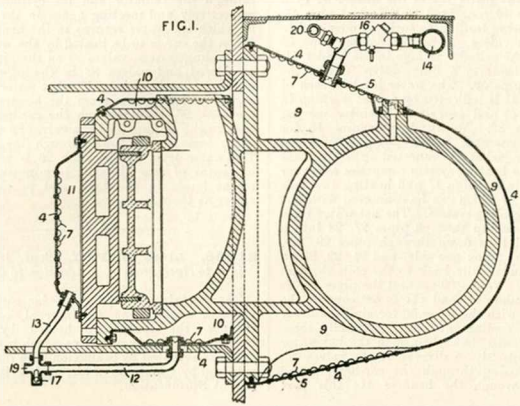
21,372. Mücke, G. Sept. 19, 1911, [*Convention date*].

Thermostats.—An incubator is provided with a rising and falling cover, for the purpose of cooling or airing the eggs during the later part of the incubation period; it may be operated by a thermostat. The cover 3 is connected by cords 16 passing over pulleys 15 to a rising and falling tank 14, which is usually empty but can fill with water from a tank 21 through a valve 23, operated by an electro-magnet 25 energized by a contact thermometer 26^1 in direct contact with the eggs. When the tank 14 has descended a given distance, a cock 29 is opened by linkwork 30 to discharge the tank, the outflow being regulated by a nozzle 32 or a valve, thus allowing the tank to rise and the cover 3 to fall into position again.



21,622. Luard, E. S. Sept. 23.

FIG. 1.



Non-conducting coverings for heat.—Steam boilers, pipes, cylinders, valve-chests, &c. are provided with vacuum jackets, in the exhausting-pipes of which non-return valves are fitted. Fig. 1 shows an engine cylinder and valve-chest provided with jacketing 4 enclosing spaces 9, 10, 11 formed of sheet metal 5 to which corrugated sheet metal 7 is secured. The spaces may be connected by pipes 12, 13, and one or more of them connected to a vacuum main 14. Non-return valves are provided as at the part 16, and a drip-valve 17 in the cross-piece 19 which may be connected to the vacuum main; the pipe 20 may be connected to the cylinder and cover portions of the jacketing. In a system for heating the carriages of a railway train, the main vacuum pipe may be the vacuum-brake train-pipe, or it may be independent, an exhauster such as a steam-ejector being worked from the locomotive. The various sections of the pipe jacketing may be interconnected or separately connected to the vacuum pipe.

21,665. Burton, C. D., and **Garner, Telford, & Hardman.** Sept. 24.

FIG. 1.

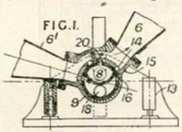
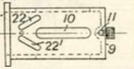


FIG. 4.

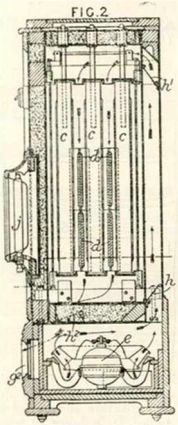


Steam-traps. — A steam-trap, Fig. 1, which may be used for pressures either over or under atmospheric, comprises two hollow receivers 6, 6¹, secured to a sleeve 15 mounted on a trunnion 9, which is shown separately in plan in Fig. 4, having ports by which the receivers are alternately filled and emptied. In the position shown in Fig. 1, water passes into the upper part of the trunnion from a descending pipe 8, and enters the uppermost receiver 6 through a port 20, air and steam being expelled by a pipe joining the top of the receiver to a port in the sleeve 15 which then registers with a port 11 on the trunnion, connected to the steam-space. When sufficient water has collected, the receiver 6 falls on a spring buffer 13, and the water is then discharged through ports 14, 16 to the lower part of the trunnion and a pipe 18, while air enters the receiver through the port 20, which then registers with one of two open recesses 22, 22¹ on the trunnion.

21,854. Harrison, A. F., and **Peard, O. L.** Sept. 25.

Heat-storing apparatus; thermostats. — Relates to heating-appliances mainly of the type described in Specification 13,334/11. A fan *e* is employed to circulate air past heat reservoirs *c* and heating-devices *d* to outlets g^2. Automatic louvers *h*, h^1, h^2 prevent air circulation when the fan is not running. The heaters preferably consist of thin sheets of uralite covered with asbestos paper, on which are transversely wound

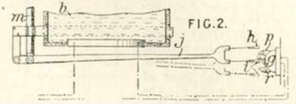
turns of bare chrom-nickel wire. Each is covered with thin asbestos, pressed, and enclosed in a sheet-metal case. Four heaters are shown, the two lower being of a capacity such that they



supply heat at a rate equal to radiation losses when the desired maximum temperature has been reached. The whole four supply heat at a rate equal to the maximum heat input and the two upper heaters are controlled by a thermostatic switch. An external radiator j of ordinary radiant lamps may be added.

22,546. Berry, A. F. Oct. 3.

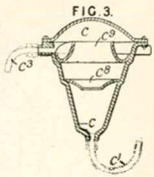
Thermostats actuated by expansion of solids. Current supplied at low rates for protracted periods for heating water in a reservoir b, described for example as that of a domestic hot-water supply system, is cut off or reduced suddenly, or the circuit is re-connected, according to the temperature of the water. The lever arm j is actuated by the different expansion of



the vessel b and an external rod m. In the example shown, projections p, r hold up spring "flickers" h, i until sufficient energy is stored to operate the tumbler switch g suddenly in one direction or the other.

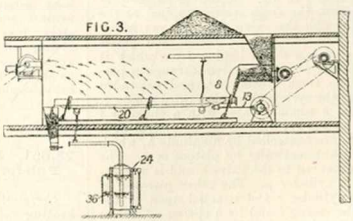
22,594. Ferguson, J. J. Oct. 4.

Heating buildings.— In a system of heating by hot-water circulation, a boiler c is employed having a supply pipe c^3 connected to its upper part and also to a tank-filled set of radiators, and a trap-bend discharge pipe c^1 connected to its lower part and leading above and discharging into an open undivided overhead cistern, which serves as a hot-water reservoir and also for cold-water supply. From the situation of the feed pipe c^3, it follows that air is entrapped in the boiler. A fire below heats the boiler, the upper part of which rises to a high temperature. The entrapped air drives out the water in the lower part into the overhead cistern, water flowing in from the pipe c^3 which, causing a slight contraction in the air entrapped, draws in more water. This water is heated by flowing over the heated rings c^8, c^9 and the action recommences. The boiler may be in the form of a wide-bore spiral tube.



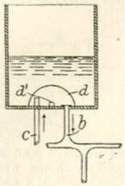
23,019. Blake, M., and **Smart, R. H.** Oct. 9.

Steam-traps. — A steam-trap for use with a special trough drying-apparatus comprises a closed vessel into the bottom of which the steam is delivered, provided with two or more valved discharge pipes 36 at different levels.

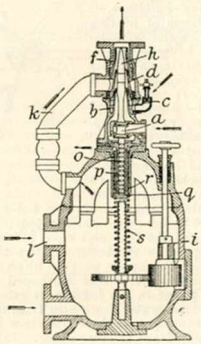


23,141. Forrest, H. P., Rawson, J. G., and **Forrest, J. P.** Oct. 10.

Heating buildings.—In a distributing-tank for a hot-water heating-installation, or for hot-water supply, the orifices of the flow-pipe *c* from the boiler, which projects above the floor of the tank, and of the distributing-pipe *b* are covered by a hood *d* communicating with the rest of the tank by perforations d^1.

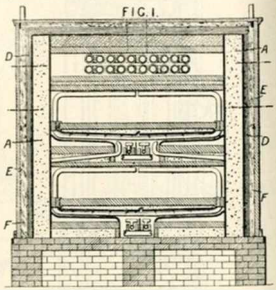


23,263. Köhler, H. Oct. 17, 1911, [*Convention date*]. *No Patent granted (Sealing fee not paid).*



Heating by circulation of fluids.—Relates to steam heating-systems in which the fresh steam causes a circulation in the system and at the same time draws in air. According to the present invention, the fresh steam supplied to the nozzle *b* through the valve *a* first draws in air through a non-return valve *c* and then passes to a second nozzle *d*, on issuing from which it draws in steam from the system through a passage *k*. The fresh steam, air, and expanded steam enter the system through a third nozzle *f*. The passage *k* communicates with a chamber *i* connected to the return end of the system at *l*. The nozzles are controlled by a spindle *h*, which is operated automatically by pistons *o*, *q*. The piston *o* is secured to the valve *a* and is a working fit in a cylinder *p*. The other piston *q* is fitted in a cylinder *r* and is acted upon by the steam in the casing *i* and by a spring *s*. When the steam in the casing *i* reaches a predetermined pressure, the piston *o* is forced upwards by the piston *q* and the valve *a* is closed.

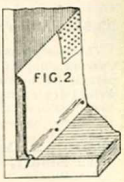
23,282. André, C. *June 4.* [*Addition to* 7300/11, *Class* 51 (ii), Furnaces &c. for applying &c.]



Non-conducting coverings for heat.—A heat-insulating covering for the oven described in the parent Specification consists of a lining of corrugated paper D, a layer of wood fibre F, and a partitioning of boards B, all rendered incombustible. A is the clinker lining previously provided.

23,299. Müller, H., and **Müller, F.** Oct. 11.

Radiators.—A wall skirting which may contain gas and heating-pipes consists of a metal strip bent obliquely at the lower edge, where it is secured to the floor by screws, the spring in the metal causing the upper bent edges to abut against the wall. The strip may be plain metal, or it may be veneered on both sides as shown in Fig. 2; the plate is perforated to hold the glue for binding the veneer sheets.

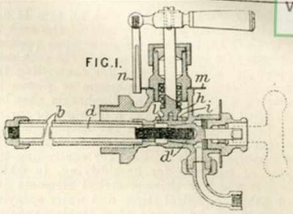


23,651. New Vacuum Heating Co., and **Pulsford, F. C.** Oct. 16.

Thermostats.—The supply of steam or other heating-medium to a radiator or the like is controlled by a conical valve d^1, adjustable on the

free end of an iron rod *d*, the other end of which is carried by a copper tube *b*, within the radiator, and a hand-operated controlling-valve is also provided. The hand valve may be a flat rotary disk valve *h*, provided with a long port *i*, which may register with one or more ports *l* of different sizes in the seat. Or the hand valve may be a conical plug cock, provided with a number of small ports to register with a long port in the seat. A stop *n* may co-operate with stops formed on an indicator plate *m* to indicate the full open and the closed positions of the controlling-valves. Specification 12,944/02 is referred to.

FIG. I.



23,758. Sterne, L. Weigert-. Oct. 17. [*Cognate Application*, 26,661/12.]

FIG. 6.

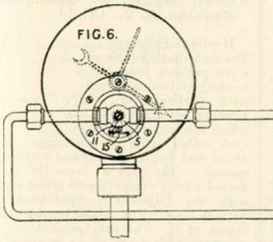
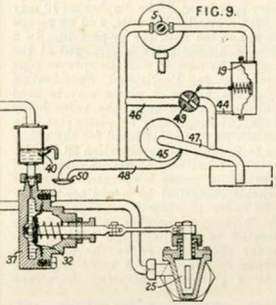


FIG. 9.



Thermostats.—A thermostat operating by expansion of liquid is combined with a pressure gauge serving as a temperature indicator. A tube *a*, Fig. 1, containing mercury is connected by a capillary tube *b* with a Bourdon tube *c* having a pointer *l*, on the spindle *k* of which is adjustably mounted a valve *n* co-operating with a seat *o* formed in a casing *m*, which is revolubly mounted on the gauge casing *d*, and is provided with a pointer 1 to indicate the setting. The casing *m* is formed with a boss secured by screws to a disk *v*, having a projecting pin *x* which engages with the forked end of an arm secured to a hub carrying the pointer 1. The valve has an adjustable by-pass 3. This arrangement may be used for controlling the supply of gas for heating a type-metal pot, the tube *a*, which may be of steel, being immersed in the metal; or for controlling the supply of a cooling-medium. In the modification shown in Fig. 3, for regulating the supply of steam, the valve is in the form of a plug cock 5, and the Bourdon tube is arranged with several convolutions, the end of the tube being secured to a spindle 7 having an arm 8 connected with a sector to operate the pointer *l*. An arm 9 adjustably mounted on the spindle 7

FIG. 3.

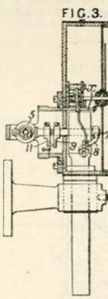
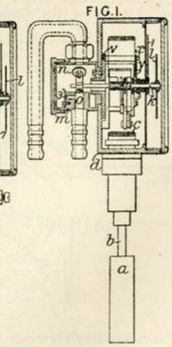


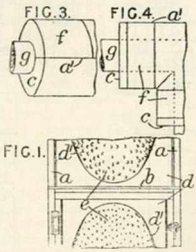
FIG. I.



engages by means of a pin with an arm 11 adjustably mounted on the spindle of the cock 5. The cock is kept in the closed or open position by means of a spring 15, Fig. 6. The cock may be used as shown in Fig. 6 for controlling the supply of steam to a diaphragm or piston 32 operating a cock 25. The diaphragm chamber 37 is filled with water, and a dash-pot or spring may be connected between the diaphragm and the cock to retard the movement of the cock. The apparatus may be used for controlling the supply of moisture for humidifying, in which case wet and dry thermometrical elements are used either to control steam and water sprayers separately, or by means of a single gauge to operate several diaphragm or piston valves. As shown in Fig. 9, water is supplied to a sprayer 50 by a continuously-running pump 45, having a by-pass 46 with a valve 49 which is operated through a diaphragm 19 by means of a gauge cock 5, so that when the valve 49 is open the supply of water is reduced. The diaphragm 19 may be fitted with a small relief hole, and an escape pipe 44 is connected with the by-pass 46. In a modification, a hinged valve is arranged at the junction of the by-pass 46 and the sprayer pipe 48. According to Provisional Specification 23,758/12, a diaphragm or piston may be used instead of the Bourdon tube, the valve being mounted on the diaphragm or piston; and an electric switch may be substituted for the valve. According to Provisional Specification 26,661/12, a needle valve admitting steam or other fluid to a diaphragm or piston is operated by one or more solenoids controlled by a contact-thermometer. In order to allow the escape of fluid from the diaphragm chamber, a self-closing valve mounted on the diaphragm may be operated by the pilot valve or by the movement of the diaphragm, or the pilot valve may close the circuit of a magnet operating the escape valve.

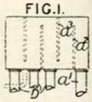
Steam-traps.—The diaphragm chamber 37, Fig. 6, is connected with a trap having a ball valve 40 to allow the discharge of condensed steam.

23,791. Garland, J. Oct. 18.



Non-conducting coverings for heat.—A device for use in the application of non-conducting compositions to steam-pipes &c., comprises a box or casing made in two parts hinged together and adapted to be fitted temporarily on the pipe &c., the composition being introduced through hinged doors in the casing which is retained concentrically on the pipe &c. by end-pieces. Fig. 3 indicates a form of casing suitable for an horizontal pipe *g*, and Fig. 4 a modification adapted for a T-piece *g*; the two parts of the casing are hinged together at a^1 and are provided with end-pieces *c* for positioning them on the pipe &c., and hinged doors *f* for the introduction of the material. The casings may be built up of angle-iron bars *a*, *b*, Fig. 1, filled in with sheet metal *d* having openings d^1 and lined with perforated zinc &c. *e*.

23,987. Gould, W., Gould, H. W., and **Jenkins, A. J.** Oct. 21.



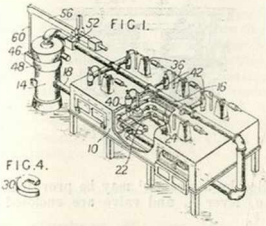
Heating buildings. — The distributing-tank of a low-pressure hot-water heating-system is fitted with partitions a^2, a^3 forming compartments, which communicate with each other alternately above and below the normal water-level in the system. The pipe a^1 from the boiler is connected with a compartment which communicates with the adjacent compartment above the normal level. The pipes to the radiators are shown at D. The arrangement is stated *inter alia* to permit a system to be installed without regard to the position of the boiler and to maintain an automatic and continuous circulation. In a modification, the pipe a^1 is connected with an independent tank which communicates with the distributing-tank at a point above the level of the water; or the pipes D may be connected directly with the independent tank above the level in the system.

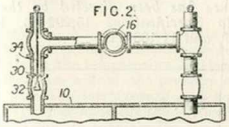
24,689. Haddan, R., [*Candee Incubator and Brooder Co.*]. Oct. 28.

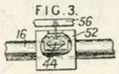
Thermostats. — In a multiple-compartment incubator, in which each compartment is heated by a series of hot-water pipes 24, a thermostat 40 in each compartment by means of a rod 42 carrying a balanced lever 36, causes a conical valve to engage a special seating 30, Fig. 4, and cut off the hot-water supply to the compartment from a pipe 16. The temperature of the hot water is, before reaching the compartments, controlled by a thermostat 44, Fig. 3, which is suspended from a balanced rod 56 in a box 52, surrounding a cut-away portion of the pipe 16, and causes a rod 60 to operate a damper 46, to admit cold air to the drum 48 of the heater 14.

(*For Figures see next page.*)

24,689.

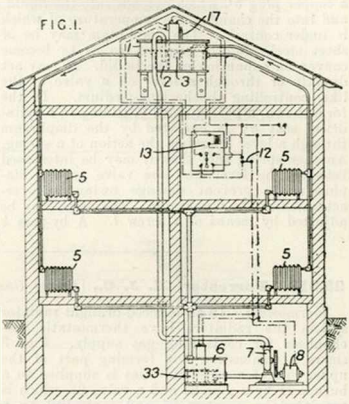






25,104. Löfquist, H. Nov. 1.

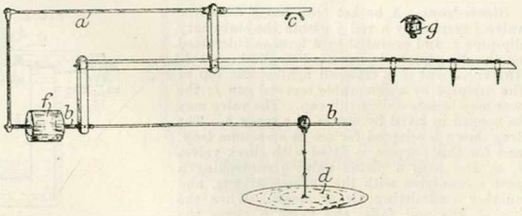
Heating buildings. — In a house-warming system, water is heated by electric heating-elements in a tank until a suitable temperature is reached, whereupon the heating-circuit is broken and the circuit of an electric motor driving a pump for circulating the hot water through radiators is closed. In the system shown in Fig. 1, water is heated in a thermally insulated tank 1 and passes through radiators 5 to a lower tank 6, from which it is pumped to the upper tank by a pump 7 driven by an electric motor 8. The tank 6 may contain a small



heating-element 33, which is switched in with the motor 8. The system is controlled by a switch 13, which may be actuated by hand or automatically through a pawl and ratchet-wheel by an electro-magnet, the circuit of which is closed by a thermal switch 17 when the temperature of the tank 2 is high enough. The motor 8 may be connected directly across the mains by a switch 12 so as to allow water to be heated in the tank 1 and circulated at the same time. The switch may be provided with an indicator. The tank 1 may have a controlling-float 3.

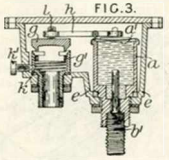
25,214. Rolls, E. J. Nov. 4.

Thermostats.—A pair of parallel levers *a*, *b* with a damper *d* and counterpoise *f* are pivoted to a bracket which is readily attachable to an incubator, the lever *a* being operated at *c* by the ordinary capsule-actuated lever, from which the damper is removed. An adjustable block *g* having a short curved steel wire bears against the part *c*.



25,265. Stimson, E. F. Nov. 4.

Thermostats. — A capsule containing expansible liquid is formed by a vessel *a*, closed at one end by a diaphragm a^1 and at the other by a copper plug b^1, which extends into the liquid, and into the chamber the temperature of which is under control. The diaphragm may be of sheet steel, slightly concave, so as to become convex on expansion of the liquid. It may act directly or through a lever on a valve or the like, controlling the heating-medium. In the form shown, a ported valve *g*, sliding in a cylindrical seat g^1, is operated by the diaphragm through a lever *h* against the action of a spring. Another spring (not shown) may be interposed between the lever and the valve or the diaphragm to prevent damage owing to over-actuation of the diaphragm. The valve may be adjusted by means of a screw *l*. A by-pass *k*

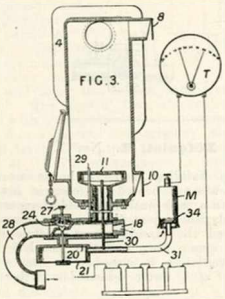


controlled by a screw k^1 may be provided. The vessel *a*, lever *h*, and valve are enclosed in a casing *e*.

Reference has been directed by the Comptroller to Specifications 15,292/86, 9033/94, 17,929/07, *and* 17,160/11.

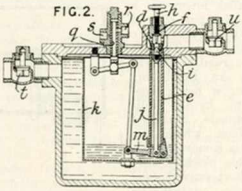
25,313. Forrester, H. J. C., [*Rector Gas Lamp Co.*]. Nov. 5.

Thermostats.—In an induced-draught radiator system the radiators have thermostatic mechanisms for controlling gas supply. Fig. 3 shows a combustion box forming part of the upper end of a radiator. Gas is supplied to a burner 11 by a pipe 28 and a valve 24, which is regulated by a screw 27 and controlled by a diaphragm 21. Air enters at 18, being drawn in by the exhaust through the radiator and the box 4. This exhaust causes the valves 8, 10 to close the box, and, by drawing air through the pipes 30, 31, produces a partial vacuum in the diaphragm chamber 20, causing the gas valve 24 to rise. The gas and air are ignited by the pilot light 29. Excessive heating of the apartment causes a thermostat T to energize a magnet M, which lifts a valve 34, and causes air to enter the pipe 31, thus destroying the vacuum in the diaphragm box 20 and closing the gas valve 24. The valves 8, 10 then open and the radiator cools. When the valve 34 falls, the parts operate so as to heat up the radiator again.



25,363. Ogden, J. E. L. Nov. 5.

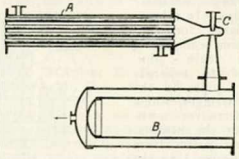
Steam-traps.—A bucket trap has a discharge valve *i* carried by a rod *j* within the stationary dip-pipe *e*, and operated by a lever *m* fulcrumed on the dip-pipe and connected to the bucket *k*. The valve seat *d* is clamped against the top of the dip-pipe by a removable screwed cap *f*; the seat may be screwed on this cap. The valve may be opened by hand by means of a screw *h*. The trap shown is adapted for use as a vacuum trap, and for this purpose is fitted with check valves *t*, *u*, and with a piston valve *q* controlling a port *r* connected with the vacuous system, and another *s* admitting air or steam. When the bucket fills and falls, the valve *q* closes the port *r* and opens the port *s* to admit air or steam, the water being then discharged past the valves *i*, *u*. When the bucket rises, the port *s*



is closed and the port *r* opened, so that a vacuum is produced in the trap, and water can enter it past the valve *t*.

25,711. Sudfeldt & Co. Nov. 8, 1911, [*Convention date*].

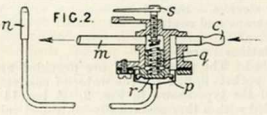
Heating by circulation of fluids.—Vessels for distillation &c. are heated by a mixture of steam and air, the air being compressed either by the steam, which is superheated or otherwise, and the heat of compression used for heating the vessel. In the form shown, the air undergoes a preliminary heating in the heater A and is then mixed with, and compressed by, a jet of superheated steam from the nozzle C. It is then used for heating a still B.



26,192. Junkers, H. Nov. 14.

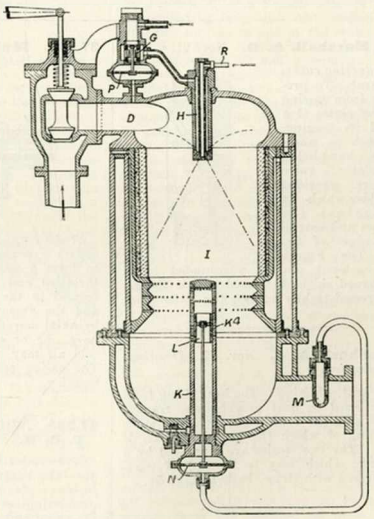
Thermostats. — A cooking-apparatus, oven, stove, or the like has an automatic gas regulator for maintaining the temperature constant. The capsule *n* contains a fluid, the pressure of which increases with the temperature and acts upon the diaphragm *p* so as to lift the valve *r* towards its seat, and thus to regulate the supply of gas flowing through the connexions *c*, *m* and the valve body. A screw and handle *s* are used to adjust the tension of the spring *q* and the rate of flow of the gas.

FIG. 2.



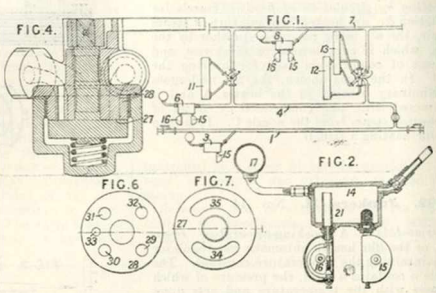
26,197. Lemale, C. Nov. 18, 1911, [*Convention date*].

Thermostats.—In apparatus for generating a mixture of combustion products and steam, the water discharge from a perforated pipe K projecting into the combustion chamber I is controlled by a perforated sleeve L, which is moved over the lower perforations K^4 in the pipe by a diaphragm N, acted upon by the vapour tension of a liquid M placed in the path of the escaping mixture.



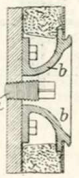
26,467. Delattre, O. Nov. 18.

Heating vehicles; steam-traps.—In a heating-appliance for railway trains comprising a main train-pipe connected to separate secondary pipes in the several carriages, which are themselves connected to the heaters, the steam passes from the train-pipe 1 to the secondary pipes 4 and thence to the heaters 11, 12, 13 and condensation pipes 7 without the interposition of pressure-reducing or regulating devices. Special steam-traps and controlling-valves for such installations are also described. The pipes 1, 4, 7 are provided with outlet pockets 3, 6, 8 for the water of condensation of the type shown in Fig. 2. A box 14 is provided with a thermostatically-controlled valve 15 of the ordinary type opening into the bottom of the box and a second valve 16 connected with the top of the box by the pipe 21. If the valve 15 should become frozen up while the apparatus is out of use, steam on being readmitted passes out through the valve 16 and, warming the water in the box 14, thaws the trap. The box 14 is of such capacity that the water of condensation in the system will not seal the pipe 21. To the box 14 is attached a cylinder 17 in which the steam is allowed to condense so as to produce a current in the pipes.



26,764. Marshall, A. G. Nov. 21.

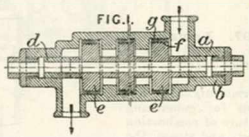
Non-conducting coverings for heat.—To prevent water from passing between the plates of a boiler and its lagging, fittings, such as wash-out plugs, hand-holes, and regulator-valve glands, are provided with shields which fit tightly against the boiler plates and extend over the edges of the lagging. The Figure shows a wash-out plug *a* surrounded by a trumpet-shaped shield *b* formed with a flange, which is pressed tightly against the boiler plate by studs.



26,858. Short, A. J. Nov. 22. *Drawings to Specification.*

Natural heat, utilizing.—The heat rising from fowls is utilized to heat greenhouses, frames, &c., by making the fowl-house the lower story of a building of which the greenhouse &c. is the upper. The two stories are separated by a porous floor, which may be formed of wire-netting covered with straw, basket-work, &c.

27,044. Müller, K. Nov. 24, 1911, [*Convention date*].



Steam-traps.—A rod *d* has a number of collars *e* engaging recesses in a casing so as to form a narrow channel in which steam is throttled and condensed. Teeth *f*, *g* may be formed in the collars and casing respectively, and the amount of throttling may be varied by axial movement of the rod. The rod *d* may have one or more axial holes through which cold air may be passed to assist condensation. The casing consists of two parts *a*, *b* bolted together.

27,285. Wild, R. L. R., and **Kolkmann, F. C. H.** Nov. 27.

Non-conducting coverings for heat.—To reduce the external corrosion of a metal vessel, such as a steam-generator, provided with a non-conducting covering, a metal electro-positive to the metal to be protected is introduced between

the covering and the vessel. The galvanized-iron spacing-pieces for non-conducting coverings described in Specification 19,498/12 may be used.

27,597. Marks, E. C. R., [*Iceless Refrigerator Co.*]. Nov. 30.

FIG. 1.

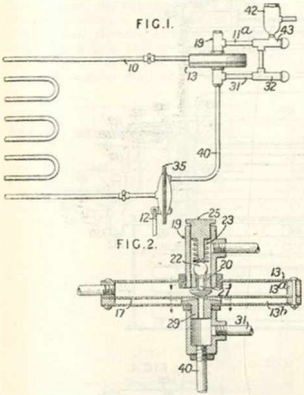


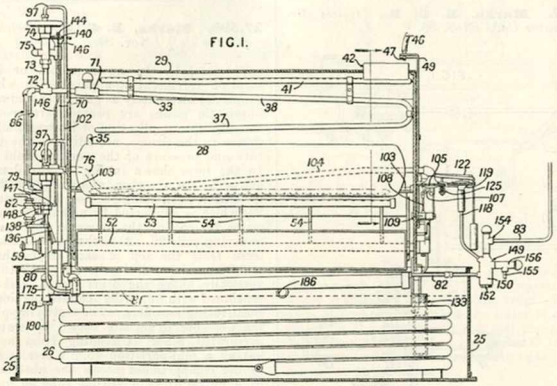
FIG. 2.

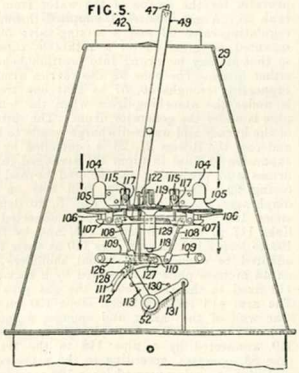
Thermostats.—The supply of a refrigerating-medium such as liquid ammonia to the evaporating and expansion coil of a refrigerating-apparatus is controlled automatically by a thermostatic apparatus. The liquid ammonia is admitted through a ball valve 22, Fig. 2, which is normally held on its seat by a spring 23 adjusted by a plug 25. The casing 13 is divided into two chambers by a diaphragm 17 resting on a plug 29 and supporting a pin 27 fitting in the valve seating plug 20. The coil 10, Fig. 1, in which the evaporation and expansion of the ammonia takes place, leads from the upper chamber 13^a to one side of a diaphragm casing 35, and the expanded gas returns by a pipe 12 to the re-liquefying apparatus. The lower chamber 13^b is connected by a pipe 40 to the other side of the diaphragm casing 35. The pipe 40 contains a suitable fluid, preferably ammonia obtained from the liquid ammonia supply through a by-pass 31, normally closed by a valve 32. The pressure of the ammonia confined in the tube 40, when the operation is started, is sufficient to raise the pin 27 and lift the valve 22 off its seat, to admit ammonia into the refrigerating-coil. The frost line advances as the coil becomes colder, and eventually reaches the casing 35. The temperature of the diaphragm in the casing 35 and the confined ammonia on the other side is thus much lowered, and the upward pressure on the diaphragm 17 is so reduced that the spring 23 closes the valve 22. When the temperature in the refrigerating-coil rises, the valve 22 is again opened and the operation repeated.

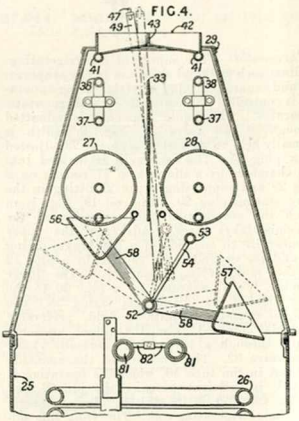
27,598. Marks, E. C. R., [*Iceless Refrigerator Co.*]. Nov. 30.

Thermostats.—In an ammonia or like absorption refrigerating-apparatus in which two drums act alternately as generator and absorber, automatic means are provided for controlling the alternate application of heating and cooling means to the drums, according to the temperature and pressure of the working fluid therein. In the form shown in Fig. 4, the drum 27 is acting as the absorber, and the drum 28 as the generator, both being enclosed by a metal casing 29, which is supported by a tank 25 containing water for cooling the ammonia condensing and receiving coils 26. A discharge pipe 35, Fig. 1, leads from the top of each drum through a middle partition 33 in the casing 29 to a point vertically above the other drum, and is then continued with upwardly inclined portions 37, 38 constituting rectifiers. The rectifying-pipes and the absorber drum are cooled by water from perforated pipes 41 leading from a box 42 having a mid-partition 43. Water is supplied to the compartment above the absorber drum by a nozzle 47 of a flexible tube 46 guided by an oscillating lever 49. An overflow pipe 186 provides for the escape of the water from the tank 25. A gas burner 53, supplied through a regulating-valve 62 and a mixing-valve 59, is mounted on arms 54 on a rotatable tube 52 so that it may be swung into position beneath either drum. The tube 52 also carries arms 58 supporting troughs 56, 57 so that one trough is under the absorbing-drum when the burner pipe is under the generator drum. The shifting of the burner and water-discharge nozzle to heat and cool the drums 27, 28 is controlled by the expansion of fluid in pipes 104 arranged in the drums and projecting at one end beyond the casing 29. The expanding fluid acts on the diaphragms in casings 105, Fig. 5, to depress stems 106 engaging levers 107, connected by links 117 to weighted levers 115, and by links 108 to levers 109, having lugs 110 at their ends adapted to engage with radial shoulders 111 on an arcuate plate 112, carried by a rock-arm 113 fixed to the rear end of the gas pipe 52. The arm 113 rocks between stops 130 on the rear wall of the casing and engages a forked end on the lever 49. A diaphragm in a casing 119, connected by a pipe 118 to the return pipe 83, operates, according to the pressure in said pipe, a spring-pressed lever 122 carrying a depending hooked link 129 engaging a lever 126, preferably pivoted on the same stud as one of the levers 109, and having a lug 127 normally adapted to stand in the path of shoulders 128 on the plate 112. The pipe 52 carries at its front end a rock arm 136 carrying an arcuate plate provided at its ends with spring shoes 138 adapted to press upon the

stem of the fuel-gas regulating valve 62 and open it. When resting on its seating, an aperture in the valve disk provides a pilot flame. When the drum 28 is heated to a temperature indicating a sufficient weakness of the ammonia liquor, the fluid in the pipe 104 in this drum acts on the diaphragm in its casing 105 to depress the stem 106 and consequently to raise





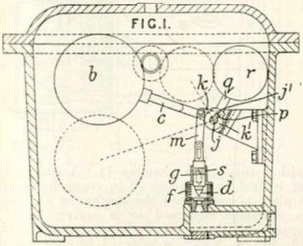


the corresponding lever 109. The lug 111 and the weight of water in the trough 56 cause the pipe 52 to swing until the lug 127 on the lever 126 engages the right-hand shoulder 128, the nozzle of the box 42 being above the drum 27 and the burner pipe 53 beneath the pipe 103, where it remains until the back pressure on the diaphragm casing 119 overcomes the tension of

the spring 125 connected to the lever 122 and thereby lifts the lever 126 to allow the burner to be shifted to its heating position below the drum 28 by the weight of the water still retained in the trough 56. The movements of the burner are damped by connecting an arm 131 on the pipe 52 with a dash-pot 133. If the temperature of the gas passing through the common discharge pipe 70 rises above a certain predetermined point, the expansion of a fluid in a tube therein operates a diaphragm in a casing 140, Fig. 1, and thereby actuates a spring-pressed lever 144, a link 146, and bell-crank lever 147, 148 to push away the spring shoe 138 and diminish thereby the fuel-gas supply.

27,602. Macrae, R. Nov. 30.

FIG. 1.



Steam-traps.—A float trap has an outlet lift valve *d*, connected by a link *m* working in a slot in the valve stem to a weighted lever *k*, which is operated by a float *b* so as to open and close the valve suddenly, and the valve-stem is provided with a split ring *s* or like frictional device bearing against a guide *g* to retain the valve in the open or closed position until the moment of actuation. The float *b* is carried by an arm *c* secured to a spindle *j*, having a key j^1 fitting loosely in a keyway *p* in a boss k^1, to which is attached the lever *k* and an arm *q* carrying a weight *r*. The weight *r* passes its vertical position shortly before the link *m* arrives at the top or bottom of the slot, and forces the valve suddenly up or down. A strainer *f* covers the valve *d*. In a modification, the valve comprises an inner part secured to the stem and an outer part mounted loosely on the stem so as to be raised after the inner part.

27,615. Dornès, R. A. Dec. 1, 1911, [*Convention date*].

Thermostats.—The Specification as open to inspection under Section 91 (3) (*a*) comprises a burner for heating a steam generator controlled, in accordance with the pressure of the steam produced, by mounting it on a wheeled framework 2, Fig. 21, and moving it by hydraulic power in and out beneath the generator, thereby automatically opening or

FIG. 21. (Cancelled)

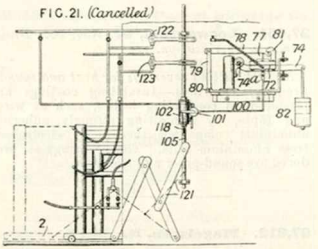


FIG. 19. (Cancld)

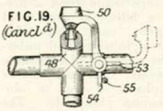
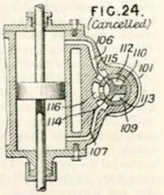


FIG. 24. (Cancelled)



closing the burner jets and at the same time regulating the oil and water supply. The steam produced in the generator acts on a diaphragm regulator 72, controlling by levers 100 the control valve 101 of an hydraulic cylinder 102. The movement of the piston-rod 105 operates a system of toggle-levers 121 connected to the framework 2 of the burner, and also regulates the supply of oil and water through valves 123, 122. The burner comprises a number of jets 48, fitted with valves 50 of the construction shown in Fig. 19, and so arranged that they are one by one shut off or opened by the movement of the burner bringing the arms 53, 54 controlling the valve 50 into contact with fixed stops 55. The diaphragm 72 is mounted on a weighted lever 74 and is fitted with a lever system 81, 78, 79 adapted to counterbalance the pressure applied to the diaphragm. The control valve 101, Fig. 24, consists of a primary valve 110 having supply spaces 112, 113, and a secondary valve 109. Upon movement of the primary valve, for example in a clockwise direction, pressure fluid is supplied from the space 113 through ports 114, 107 and is exhausted from the other side of the piston through ports 106, 115, 116. The supply of pressure fluid is then cut off by a clockwise movement of the secondary valve 109

effected by linkwork 118, Fig. 21, operated by the piston-rod 105. This subject-matter does not appear in the Specification as accepted.

27,651. Loewenthal, J. Nov. 30. *Drawings to Specification.*

Non-conducting coverings for heat and sound; fire-proof coverings.—Insulating coatings are produced on conducting bodies, such as wires and tapes, by depositing strongly adhering aluminium compounds thereon by electrolysis from aluminium salts. The coverings so produced are sound-proof and fire-proof.

27,812. Magelssen, N. Dec. 3.

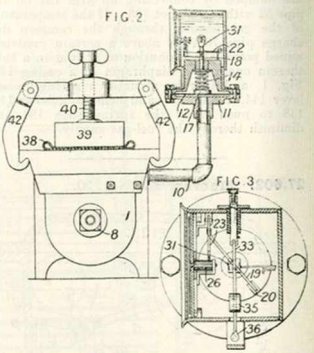
Non-conducting coverings for heat; fire-proof coverings.—Insulating building-blocks consist of plain or corrugated casings made from a fire-proof composition, and a filling of peat, peat waste, sawdust, kieselguhr, cork waste, &c. The composition consists of asbestos and water-glass with or without the addition of carbonate of lime and acid substances, such as acetic or phosphoric acid, or sulphates of iron or aluminium, or acid ammonium phosphate. The walls of the casing may be made very thin at some points, so that in case of fire, they may crack and allow any gases from the filling material to escape. The casings may be dipped into tar, asphalt, pitch, mineral or fatty oils, &c. for waterproofing. The blocks may consist of wooden cases filled with the insulating-materials and covered with the fire-proof material.

27,851. Cuthbertson, C. J. Dec. 3.

Non-conducting coverings for heat.—Asbestos fibre &c. is sifted over a flat surface, and glue &c. is sprayed over it, the operations being repeated until the layers are of the thickness required, the material being then passed through compressing rollers having V-ribs forming grooves which allow the material to be rolled on a mandrel in cylindrical or tubular form. The layers may be formed direct on ribbed rollers. Asbestos string &c. may be incorporated with the layers to reinforce them.

28,409. Hulbert, A. C. Dec. 9.

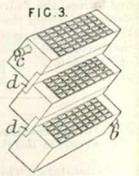
Thermostats.—Electric heating-apparatus is controlled by a pressure-gauge and switch operated through a diaphragm and rod by the variations in pressure in the apparatus, the movement of the pointer being greater than the movement of the switch. In the apparatus shown, a heater 8, Fig. 2, is immersed in water in a casing 1, which is connected by a pipe 10



with a diaphragm chamber 11. A sliding rod 18 is held by a spring 22 in engagement with a plate 17 resting on the diaphragm 12, which is normally depressed by a spring 14. The upper end of the rod 18 is secured to an arm 19, Fig. 3, which is adapted to slide at one end in a guide 20, and at the other end is connected by a link with a lever 23, having a toothed sector gearing with a pinion 26 on the spindle of the pointer. The top of the rod also bears against a block 31 of insulating fibre, secured to a pivoted arm 33, carrying a weight 35, and fitted with a contact 36 engaging with a fixed contact.

28,667. Moreau, H. Dec. 13, 1911, [*Convention date*].

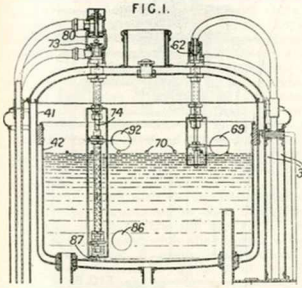
Radiators. — Cellular radiator units of the automobile type, used in heating buildings, are arranged obliquely so that the air circulation is increased while the air is retained in contact with the heating-surfaces long enough to be adequately heated. Fig. 3 shows an installation of cells arranged in series with inlets and outlets *b*, *c* for the heating-medium and junction pieces *d*. The cells may also be arranged in



parallel. Installations may be formed including cells with oblique, horizontal, and vertical passages.

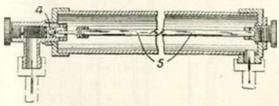
28,845. Allman, D. W. Dec. 14.

FIG.1.



Thermostats.—The supply of gas or electricity to heat a boiler is controlled by the water, so that on the level falling or rising beyond two predetermined points the supply is shut off, and under the influence of the heating the volume of water in the heater expands until at a suitable temperature the expansion of the water lifts a float 92 and rod 87, thus closing a valve 80 to the gas burner. The boiler may be heated by electricity, switches being substituted for the valves.

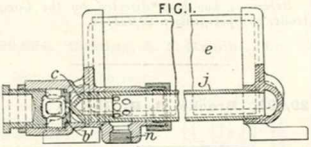
29,285. Still & Sons, W. M., and **Adamson, A. G.** Dec. 19.



Radiators; thermostats.—In a steam-heated radiator of the pressureless type, such as are used for heating railway-carriages, the admission of steam is controlled by the expansion and contraction of the radiator itself, the admission valve being allowed to close when the radiator is expanded, and prevented from closing when the radiator is contracted. In the radiator shown, a rod 5 of wood or other material having a low coefficient of expansion prevents the inlet ball-valve 4 from being completely closed against its seat except when the supply of steam is sufficient to reach almost to the outlet. The radiator tube then expands sufficiently to withdraw the rod clear of the valve.

29,487. Pintsch's Patent Lighting Co., and **Sawyer, R.** Dec. 21.

FIG.1.

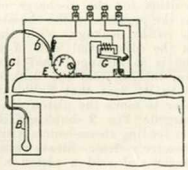


Radiators; thermostats.—Steam entering a radiator *e* past a thermostatically-controlled valve *c* returns to the exit *n* through the tubular-expanding member *j* of the thermostat lying parallel to the radiator, the outside of such member being exposed to the air within or outside of the compartment or room warmed. The valve seat b^1 is adjustable longitudinally with respect to the valve *c*. The radiator as described comprises two parallel cylinders *e*, the thermostat being between them.

29,590. Frank, H. Feb. 15. [*Convention date*]. [*Addition to* 20,241/11.]

Radiators.—The method of working a heated radiator employing a vapour as its working fluid, described in the parent Specification, is modified by the employment of two liquids of different boiling-points, for example di- and trichlorethylene. It is stated that the lower part of the radiator is heated to a higher temperature than the upper part, and that by heating the radiator more strongly, the region of higher temperature may be made to extend higher up in the radiator.

29,763. Railing, A. H., and **Garrard, C. C.** Dec. 27.

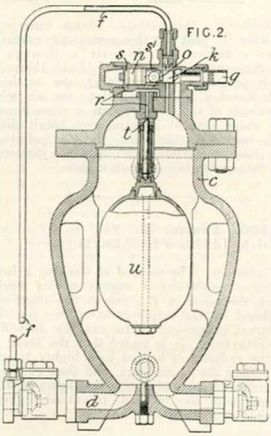


Thermostats.—A vessel B containing a liquid

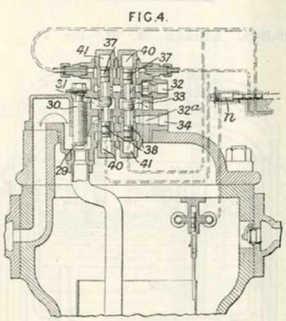
or fluid is placed in an electric oven, and is connected by a tube C of fine bore with a diaphragm chamber or Bourdon tube D, having a contact E engaging with an adjustable contact F to control the circuit of an electric-heater either directly or through an electro-magnetic relay G. The contact F consists of an eccentrically-mounted disk with graduations to show the setting.

Reference has been directed by the Comptroller to Specification 29,223/11.

29,993. Brooke, R. G. Dec. 30.



Steam-traps.—Relates to steam-traps and like apparatus of the kind in which a float valve interrupts the supply of fluid to a chamber containing a differential piston, which moves into a position for the discharge of the trap as soon as the pressure in the chamber becomes equalized, as by leakage, with the pressure acting on the differential area of the piston. The piston is so arranged that liquid cannot gain access thereto, and the float valve is so connected to its float that fluid cannot enter the chamber to move the piston until the trap has discharged. Fig. 2 shows gravity-feed apparatus for feeding steam-boilers with hot water from a pressure system. Steam pressure acting on the larger end *s* of a piston *n* maintains the valve *k* at the other end of the piston in a closed position against the steam-pipe *g* connecting the receiver *c* with the boiler steam space. The groove *o* in the piston places the receiver in communication with the pressure-equalizing pipe *f* connected to the water-inlet

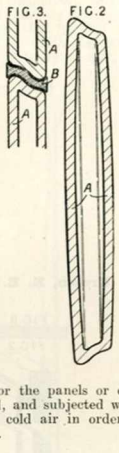


pipe *d*. The valve *t* controlling the supply of steam through the passage *r* to the larger end of the piston is operated by the float *u* through a pin-and-slot connexion. When the passage *r* is closed, the steam behind the piston decreases in pressure either by condensation or by leakage

to the space s^1 communicating with the atmosphere. In a modification for draining a system in which the pressure is below atmospheric, the valve t is in the form of a piston having a long range of motion and controls a passage placing the large end of the piston in communication with the atmosphere. In the bucket trap shown in Fig. 5, the admission of steam to the end s of the piston n is controlled by a piston-valve 14. The discharge valve 61 is opened and closed directly by the bucket. Fig. 4 shows apparatus for draining a chamber wherein the pressure varies from below to above atmospheric. The piston n regulates the admission of pressure fluid to and the exhaust of the fluid from cylinders 40, 41, containing pistons 37, 38 on the stems of oppositely operated double-seated valves 33, 31, which place the receiver in communication through the passage 32 alternately with the pressure and the equalizing-pipe connexions 32, 34, and simultaneously place the piston 30 of the discharge valve 29 in communication with the equalizing and discharge pipe connexions, so that the valve is forced on its seat while the receiver is being filled, and is released while the receiver is being discharged. Fig. 6 shows diagrammatically gravity-feed apparatus of the kind described above with reference to Fig. 2 comprising two receivers A, B, which are so connected that while one receiver is discharging the other is filling, and vice versa, and, furthermore, which are so connected that one receiver cannot begin to discharge although full until the other has discharged. The steam-pipes 65 and the pressure-equalizing pipe 68 are controlled by valves and grooves on oppositely extending stems 63, 64 on pistons 62, 62^a. Float-operated valves 70, 69 control the supply of steam from the receivers A, B respectively to the piston-chambers s. Supposing the receiver A fills and closes its valve 70 before the receiver B has discharged and opened its valve 69, then the piston 62^a remains in the position shown because the area exposed to the steam pressure on the stem 64 is greater than the area exposed to the steam pressure on the seated stem 63. When, however, the receiver B has discharged, the piston 62 crosses over, and its stem 63 cuts off steam from the receiver B and from the stem 64 of the piston 62^a, thus allowing the piston 62^a to cross over and open the steam connexion of the receiver A and the pressure-equalizing connexion of the receiver B.

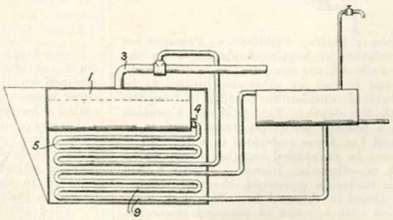
29,994. Cuming, A. J. Roach-. Dec. 30.

Non-conducting coverings for heat. — Panels of mica, glass, porcelain, or other translucent or transparent vitreous materials for use in the construction of non-conducting coverings for tubes, walls, &c., are formed with more or less parallel walls enclosing an evacuated space. Cells may be formed somewhat similarly with convex outer surfaces A to limit the area in contact with adjacent non-conducting material. The panels or cells are embedded in cork, rubber, felting, &c. in suitable framings of wood &c. Fig. 3 shows a packing-piece B of rubber, cork, &c. between two panels. Sheets of glass, mica, &c. may be cut, fused, and cemented together; or the panels or cells may be blown in a mould, and subjected while still hot to a current of cold air in order to harden the outer surfaces.



30,109. Baldwin, C. W. Dec. 31.

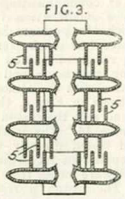
Heating buildings. — In combination with a boiler 1 for a steam heating-system, a supplementary heater 5 is fitted in the fire-box and is connected at one end with the blow-off cock 4 and at the other with the main steam circuit 3. By opening the valve 4 a supply of steam can be obtained for heating before the main generator is in action. A coil 9 for heating water may also be fitted in the fire-box.



30,112. Schönenberger, J. Dec. 31.

Radiators.—A radiator for heating buildings has vertical gills 5 parallel to its plane and arranged in staggered and intermeshing relation as shown.

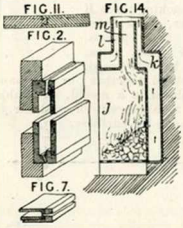
FIG. 3.



A.D. 1913.

3. Brown, E. E. Jan. 1.

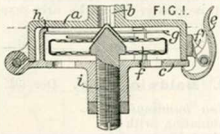
FIG. 11. FIG. 14. FIG. 2. FIG. 7.



Radiators; heating buildings. — Passages for the circulation of heating-fluids in or on the face of walls &c. are composed of hollow blocks joined end to end, or otherwise formed to be everywhere of considerable breadth in comparison with the depth. Fig. 2 shows a section of such a passage projecting from the face of a wall and Fig. 7 one embedded in a floor. The blocks may be dovetailed together as shown in Fig. 11 or otherwise joined. Where a less energetic radiation is desired, they may be entirely enclosed in the wall &c. The blocks may be formed with a series of passages connected in parallel to the source of heating-fluid. Air for circulating through such a system may be heated by the fire-place shown in Fig. 14. The fire-place *j* and flue *m* are surrounded by air-jackets *k*, *l* whence the heated air passes to the heating-passages. Regulating-valves may be placed in convenient positions in the passages.

129. Still & Sons, W. M., and **Adamson, A. G.** Jan. 2.

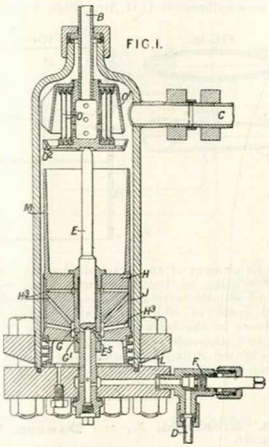
FIG. 1.



Steam-traps.—A casing having a removable cover contains an expansion device, which is retained in its place by a spring when the cover is opened. The trap shown consists of a casing *a* having an inlet *b*, with a hinged cover *c*, against which an expansion capsule *f* is held by a conical spring *g*, the outside turn of which is held in hooks *h* on the cover. The capsule may be adjusted by a screw *i*. The cover is retained in the closed position by a catch *e* hinged to the casing and controlled by a spring *f*¹, coiled on the hinge or otherwise arranged. Otherwise the capsule may be held against the fixed casing *a*.

207. Kilburn, B. E. D., [*Stokes, F. W. S.*]. Jan. 3.

FIG. 1.

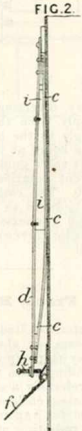


Steam-traps.—In a carbon-dioxide, ammonia, or like refrigerating-plant in which high-pressure uncondensed gas from the condenser is to be returned to the compressor after the low-pressure gas from the evaporator has already been compressed to a certain stage, a trap is provided into which the condenser discharges and from which the liquid passes by a valve operated by a float balanced by a weight or spring. In the trap shown, the liquid and gas enter at B, the liquid leaves at D, and the uncondensed gas leaves at C. A separator consisting of perforated screens O and a baffle O^1 is provided at the inlet, and the liquid falls through a perforated tray O^2. The operating-float consists of a vessel M kept full of the liquid, terminated by a weight H which is supported by a spring L and secured to a sleeve G sliding on a central rod E. Liquid overflows from the vessel M into the trap casing, whence it passes through passages H^3 in the weight H, protected by a screen J, to an annular chamber G^1 in the sleeve G, which, when the float rises, communicates with ports E^5 in the rod E and allows the liquid to escape to the outlet D. The rod E is screwed to the bottom of the casing. The outlet may be provided with a shut-off valve F. In a modification, the float may be solid and connected to the weight H by levers, the spring being dispensed with. The valve or the float or both may be guided spirally. A by-pass allowing a small constant flow of liquid may be connected across the trap.

243. Arthur, W. Jan. 8, 1912, [*Convention date*]. *Drawings to Specification.*

Non-conducting coverings for heat. — Alkali silicates in a solid brittle form containing from 10 to 30 per cent of water are crushed and heated to obtain a light highly-porous intumesced material suitable for heat-insulating, having an apparent density of 30 to 100 times less than the original material. The silicate, such as may be obtained by evaporating a solution, or by heating the melt with the requisite quantity of water in a closed vessel, is crushed and heated to about 300–400° C. The silicate solution may be atomized and introduced into a heated zone. To obtain a product having a higher softening-point than that yielded by ordinary silicate, a silicate in which the ratio of soda to silica is 1 of Na_2O to 3·8 of SiO_2 is used.

FIG. 2.



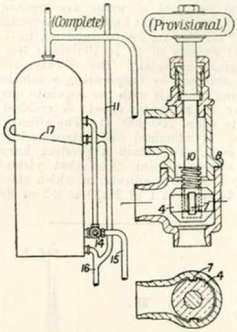
899. Pim, E. Jan. 11.

Thermostats.—The air supply to the ash-pit of a closed or other stove is regulated by a valve *f* operated by a bimetallic thermostat, consisting of two bars *c*, *d*, of metals having different coefficients of expansion, connected at their ends, and separated by a block *i* of wood or the like. The upper part of the inner bar *c* rests against the side of the stove. The lower end of the thermostat carries a screw *h* by means of which the opening of the valve *f* is adjusted.

1108. Turner, M. S. Jan. 15.

Heating by circulation of fluids.—Relates to a hot-water supply and heating system and consists in the use of a small hot-water store cylinder for purposes requiring a small supply of very hot water in combination with a large hot-water store cylinder for general uses, an improved form of three-way diverting-valve being used to alter the connexions from one store cylinder to the other as required. In the arrangement shown, a single cylinder is

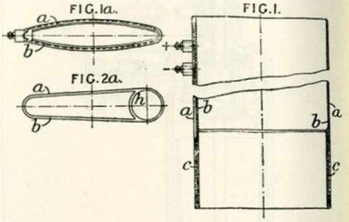
used divided by an internal partition 17 with connexions so that the upper compartment can be used alone, or the upper and lower compartments together as a single large cylinder. The



three-way diverting-valve is indicated at 14, the supply from the cold-water cistern at 11, the supply to the boiler at 16, and the return from the boiler at 15. The valve 4 is a double-sided lift valve guided by tongues and grooves 7 to prevent rotation during operation by the screw 10. The casing is in two parts with a screwed joint 8 so that it facilitates right or left hand connexions. A back or wall plate may be cast therewith for convenience in fixing to a wall.

1204. Frank, H. Jan. 15.

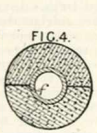
Radiators. — Radiators, whether heated by fuel, steam, or electricity, are constructed so that they store up a minimum amount of heat by (1) filling them with a liquid of low specific heat, preferably a chlorinated hydrocarbon, the liquid being enclosed so as to leave practically no space for vapour, (2) providing them with a large radiating area per unit of volume, for example, half a square metre per litre, and (3) maintaining the temperature of the liquid at less than 80° C. above that of the surrounding atmosphere. The heating-means is regulated so that the liquid does not reach its normal boiling-point, so that no heating-vapours are generated as described in Specification 20,241/11. The radiator is thus sensitive to regulation for compensating for change of temperature in the surrounding atmosphere. The following liquids are specifically mentioned as being capable of employment. Trichlorethylene C_2HCl_3, carbon tetrachloride CCl_4, dichlorine heptoxide Cl_2O_7, oxybromide of carbon $COBr_2$, thiocarbonylchloride $CSCl_2$, sulphuryl chloride SO_2Cl_2, chloroform $CHCl_3$, thionyl-chloride $SOCl_2$, tetrachlorethane $C_2H_2Cl_4$, hexachlorethane C_2Cl_6, dibromethylene $C_2H_4Br_2$, perchlorethylene C_2Cl_4, tribromethylene C_2HBr_3, and iso-amylbromide $C_5H_{11}Br$. Figs. 1 and 1a



show an element of an electrically-heated radiator consisting of two tubes with their walls *a*, *b* of elliptic section enclosing a very small liquid space in which is located a heating-resistance in the form of a coil *c*. Fig. 2*a* is a section through the element of a fuel or steam-heated radiator in which *h* represents a heating-flue or steam-pipe.

1264. Archibald, J., and **Dawson, W.** Jan. 16.

Non-conducting coverings for heat.—A non-conducting composition may be applied to pipes, traps, &c. by means of a casing, Fig. 4, which may be left permanently in position if desired. The flanges *f* serve to retain the pipe centrally while the material is being packed in.

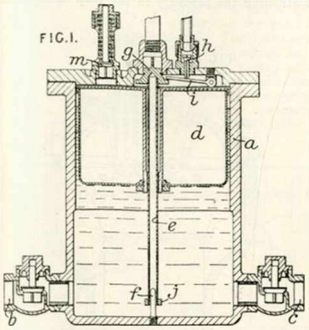


1322. Ogden, J. E. L. Jan. 16.

Steam-traps.—A trap for working under pressure or vacuum is actuated by a hollow float *d*, which fits loosely in a casing *a*, and actuates valves *g*, *h* connecting the space above the float alternately to the vapour space and to high-pressure steam or the atmosphere to admit and expel water to and from the trap; the float serves as an insulator between the vapour and liquid. In the form shown, the float is mounted loosely on a tube *e* which carries the valve *g* and is guided by a rod *f*; the float acts by engagement with a stop *j* and the valve *g*. When the valve *g* is raised slightly by the float, and before it is closed, it raises a lever *i*, causing the steam-valve *h* to open; the valve *g* is then closed by steam pressure. A safety-valve *m* may be provided. Non-return valves

are fitted in the inlet and outlet *b*, *c* respectively, and the outlet valve may be loaded by a spring or otherwise to work under any desired

FIG. 1.



pressure. According to the Provisional Specification, the water may be discharged to a high level or may be returned to the boiler.

1375. Lamin, J., and **Stockdale, G.** Jan. 17.

FIG. 1.

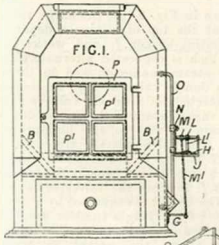
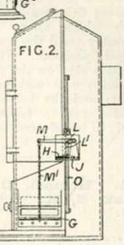


FIG. 2.



Thermostats.—A door G admitting air beneath the grate of a closed stove is controlled by a thermostat H comprising a flat metal container with elastic walls, and filled with ether &c., which is adjustable in position on the stove to vary its effect. The thermostat H rests on a platform J, having sockets N by which it is adjustably carried on a rod O, and its movements are magnified and communicated to the door through a rod L^1, arms L, M, and a chain M^1. The thermostat may be adjustably carried on a horizontal bar so that it may be moved to or from the stove.

1790. Caldani, E. Jan. 22.

FIG. 1.

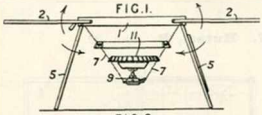
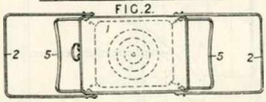


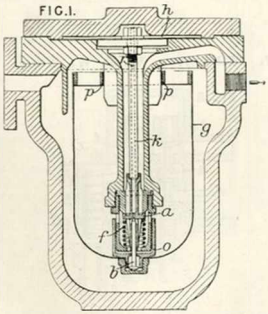
FIG. 2.



Bed-warmers.—A bed-warmer consists of a polygonal frame supporting a source of heat and having pivoted legs and arms for keeping the bed-clothing in a raised position. An oil lamp 9 is suspended by chains 7 from a rectangular frame 1 having rectangular arms 2 and legs 5. Heat deflectors 11 are provided above the lamp.

1955. Davidson, J. Jan. 24. [*Cognate Application*, 16,505/13.]

FIG. 1.

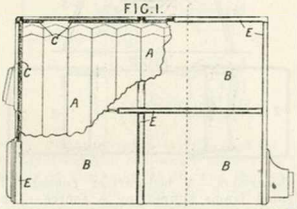


Steam-traps.—A pilot valve actuated by a

bucket to admit water under pressure to one side of a diaphragm or piston which opens the main outlet valve, is arranged in alinement with the latter at the lower end of a tube depending from the lid of the trap so that both valves are always under water. In the trap shown, the pilot valve *b* is actuated by a cup *o* on the bucket *g* to admit water through the main valve *a* and a tube *k* to a diaphragm *h*, which opens the main valve against a spring *f*. The tube *k* has one or more small holes *r* to allow escape of water from the top of the diaphragm *h* after the pilot valve *b* is closed. The bucket may have a guide-ring *p* at the top.

2437. Hutsel, R. Jan. 30.

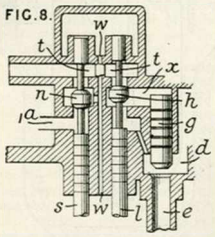
FIG.1.



Non-conducting coverings for heat. — Non-conducting casings or jackets for boilers are built up of plates of sheet iron to the inside of which is attached hair felt, asbestos cloth, &c. To secure the plates together, their edges are turned up and engage appropriately-shaped slips of metal. Fig. 1 shows a boiler A enclosed in a casing built up of plates B lined with insulating-material C and secured together by metal slips E.

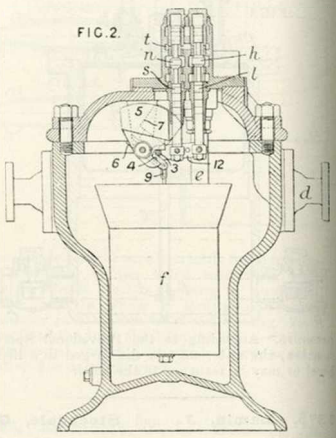
3097. Millington, W. E. W. Feb. 6.

FIG.8.



Steam-traps. — A float or bucket actuates simultaneously in opposite directions two double valves, one of which controls the liquid-discharge valve by connecting one side of it alternately to high and low pressure, the other double valve controlling the pressure in the trap casing. In

FIG.2.



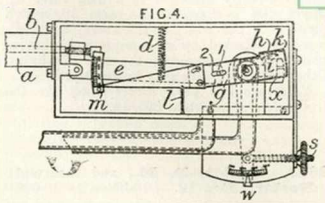
the trap shown in Fig. 2, the discharge valve *g* is arranged at the top of a pipe *e* depending into an actuating-bucket *f*, and works in a chamber *x* which is connected alternately to a high-pressure steam connexion and to the exhaust *d* by a double valve *h*, Fig. 8; the trap casing is connected by a double valve *n* alternately to the vapour space of the system drained by a connexion 1^a and to the high-pressure connexion *t*. The valve-rods *s*, *l* are connected to a lever 12 having a pin 3 which engages the sides of a gap 4 in a weight 5, operated by the bucket *f*, to move the valves in opposite directions. The bucket is connected by a slotted link 9 to a lever 6 carrying a tumbler weight 7; the lever 6 is connected to the weight 5 by a clutch which allows the weight to remain stationary until the tumbler weight 7 passes its vertical position. The weight 7 may fall against a stop on the pipe *e*. In modifications, the valves *n*, *h* may be balanced by springs or weights and the valve-operating lever may be provided with a rolling weight. Specification 26,407/10 is referred to.

3321. Hempel, O. M., [Firm of], and **Fink, C. K.** Feb. 9, 1912, [*Convention date*].

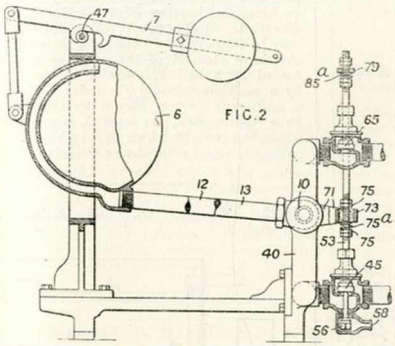
Thermostats.—A valve is operated by an expansion member through levers, the valve seat being formed on a hollow journal which is adjustable and provided with an indicator. The

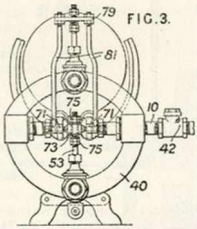
expansion member consists of a tube a, inside which is a steel rod b bearing against one arm of a spring-controlled lever e, the other arm of which is connected by means of a pin 1 and slot 2 with another lever g carrying the valve h and a temperature indicator k. The valve seat i is formed at the end of a bent passage in a journal x, which is adjustable by means of a screw s connected with a pointer w indicating the setting. When the tube expands, the spring d closes the valve. When the tube contracts, the indicator k is moved against a stop m by a spring l.

FIG. 4.



3345. Justice, P. M., [*Nashua Machine Co.*]. Feb. 8.



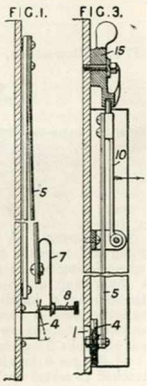


Steam-traps.—A counterbalanced receiver is arranged to open and close positively the steam-inlet valve and the water-discharge valve. As shown in Figs. 2 and 3, the receiver 6 is mounted by means of pipes 12, 13 on trunnions on a hollow frame 40, and is counterbalanced by a lever 7 adapted to slide on a fulcrum 47. A cross-head 73 pivotally mounted on ears 71 projecting from the supports for the pipes 12, 13, plays between nuts 75 on the stem 53 of the steam-valve 45. Another cross-head 79 for operating the discharge valve 65 in a similar way is connected by rods 81 with the ears 71. The nuts are adjusted so that when the receiver is overbalanced by water entering through the pipes 10, 12, the steam-valve is opened slightly in advance of the discharge valve, and steam is admitted through one side of the frame 40 to the receiver through the pipe 13, to discharge the water through the pipe 12 and the other side of the frame to the valve 65. Springs 75^a, 85^a are interposed between the cross-heads and the lower nuts to prevent damage to the valves when closing. A check valve 42 is provided in the inlet pipe, and a vent valve 56 is opened when the steam-valve is closed.

3523. Hodges, F. W. Feb. 11.

Thermostats. — For automatically regulating combustion in closed-ashpit stoves, a straight compound metallic strip is attached to the wall of the stove so that it extends parallel thereto, its free end being adapted to operate a valve controlling the admission of air to the ashpit. The fixed end may be connected to the stove by a bar of good-conducting metal, and the whole may be enclosed in a casing. As shown in Fig. 1, the free end of the strip 5 is provided with a spring 7 having an adjustable screw 8, which bears on the tail-piece of a hinged valve 4. In Fig. 3 the strip is

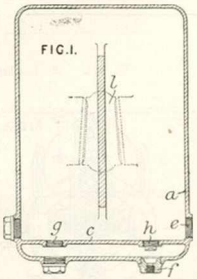
FIG. 1. FIG. 3.



shown directly attached to a disk valve 4; its upper end is fixed to an arm 10, which is pivoted to the wall of the stove, and adjustment is effected by a cam-piece 15 having a helical groove engaging the end of the strip. Other forms of valve may be employed.

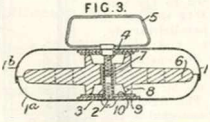
Reference has been directed by the Comptroller to Specification 899/13.

3643. Nesbit, D. M., and **Ashwell & Nesbit.** Feb. 12. [*Addition to* 10,028/11.]



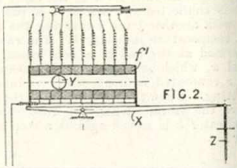
Radiators.—A baffle *c* is interposed between the inlet *e* and exhaust *f* for heating-medium in a radiator *a* constructed according to the parent Specification, suitable openings *g* being left capable of being closed by plugs *h* so as to cause the fluid to pass circuitously before leaving the radiator. To support the radiator, a wedge-shaped fitting *l* attached to the wall fits into a dovetailed socket on the radiator.

4674. Thwaites, J. Feb. 24.



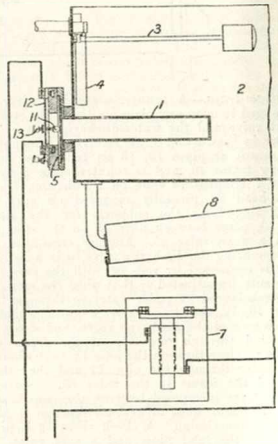
Bed-warmers. — A bed-warmer consists of a casing 1 formed as shown in two parts 1^a, 1^b and enclosing a heating-block 6. The two parts of the casing are held together by a screw 4 attached to a handle 5 on the part 1^b and engaging with a threaded tube 3 attached to the part 1^a by a screw 2. The block 6 is slipped over the tube 3 and is formed with perforations 7 and flanges 8 bearing on asbestos washers 10 attached to metal washers 9 in the casing 1.

4843. Apparate - Vertriebs - Ges. Feb. 28, 1912, [*Convention date*].



Thermostats.—A gas-pressure regulator is provided with means controlled by a pyrometer to keep the heating effect produced constant. Electrical, fluid-pressure, or mechanical means may be employed. In the form shown in Fig. 2, the valve stem Z of the pressure regulator is loaded by a ball Y, movable along a lever X by a multiple solenoid *f'*, under the control of a multi-way switch, moved by the pyrometer. In a modification, the lever X is provided with a tumbler weight which can be shifted by two solenoids under control of a dash-pot.

5482. Kratt, C., and **Aikman, J.** March 5.

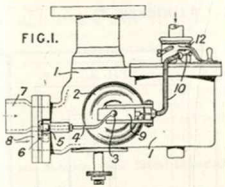


Thermostats.—A casing 1 containing air is placed in the path of liquid entering a container 2, and has a diaphragm 5 carrying an

insulating-stud 11 bearing against an adjustable screw 13, which is mounted on a spring contact 12 controlling an electro-magnetic switch 7 in the circuit of a heater 8. Specification 25,296/09, [*Class* 39 (iii), Heating by electricity], is referred to.

5632. Hans, J., [*Lyma Vergaserfabrik Dietz & Co.*]. March 6.

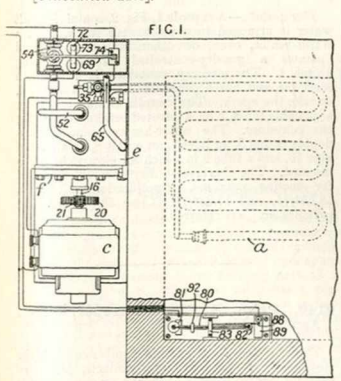
FIG.I.



Thermostats.—The temperature of a carburettor is automatically regulated by a capsule 2 fixed to the carburettor casing 1 and connected through a cranked rod 4 and resilient arm 5, to a damper 6, which controls the supply of hot and cold air through passages 7, 8 respectively. A wedge 9 allows of independent adjustment of the damper. Specification 5631/13, [*Class* 7 (iii), Internal-combustion engines, Carburetting-apparatus &c. for], is referred to.

5865. Hapgood, C. H. March 18, 1912, [*Convention date*].

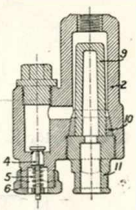
FIG.I.



Thermostats.—In a refrigerating-apparatus, a thermostat opens or closes the circuit of an electro-magnet operating a lever 69, which opens or closes the circuit of the motor driving the compressor pump, and controls a valve 54 admitting water to a condensing-coil for the compressed gas. The thermostat consists of a pivoted glass tube 80 containing mercury, terminating in closed bulbs 81, 82 containing an expansible liquid, such as ether, and a compressible fluid such as air respectively. As the temperature in the refrigerating chamber rises, the mercury runs down in the bulb 82 and rocks the tube 80 on the bar 83, thereby bringing parts 88, 89 into contact and completing a circuit, energizing an electro-magnet 73, and depressing the lever 69. The temperature at which the circuit is completed can be adjusted by means of a weight 92 slidable on the tube 80.

6993. Ribes, P. C. March 22, 1912, [*Convention date*].

Steam-traps. — A steam-trap consists of a receiver 2 having a porous tube 9 of porcelain or similar porous ceramic material through which water of condensation permeates, together with a valve 4 which opens to discharge water freely when the steam pressure is cut off. A spring 5 opening the valve is adjustable by means of a perforated cap 6. The tube 9 is secured by means of a bronze washer 10 and a screw 11.

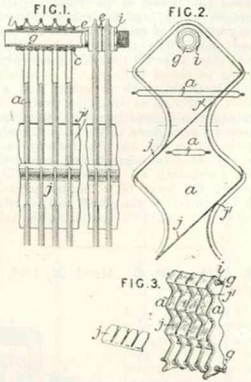


7877. Moreau, J. April 4, 1912, [*Convention date*].

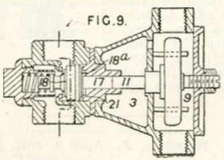
Radiators. — Radiators for heating buildings &c. are built up of units formed of pieces of sheet metal stamped to a particular shape and folded over each other at the edges, enclosing perforated rings for attachment to collector tubes, whereby heating-medium is introduced and removed and the units are held together. Removable inclined baffle-plates attached to the units are also described. Fig. 2 shows the shape of the units *a* which are formed with flanges hooked together as shown in Fig. 1. Each half unit is formed with a collar *e* which is bent over to enclose a perforated ring *c*. Through the rings *c* passes a perforated collector tube *g* and the whole is held together by nuts *i*. The units are formed with projections on which rest baffle-plates *j*, j^1, formed as shown in Fig. 3 to slide between the units so as to be easily removable for cleaning.

(*For Figures see next page.*)

7377.



7940. **Wild, A. G.** April 4.

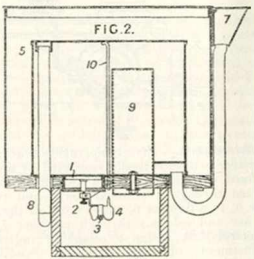


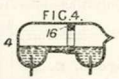
Thermostats.—A capsule-operated valve 18 for high-pressure steam heating-apparatus is provided with a valve-like packing member 18ª which seats against the spindle guide 21 when the valve is fully opened, thereby preventing leakage of high-pressure steam along the stem 17 to the low-pressure chambers 3, 9. The stem is made in two parts 17, 11 which abut on each other.

8958. **Marks, E. C. R.,** [*Theumer, R.*]. April 16.

Radiators.—Radiators or the like for use in steam or hot-water heating-systems, are made from a mass which is capable of being cast on the addition of soda. The mass consists of highly refractory clay poor in silica and fluxing agents, together with a refractory porous material, or one which becomes porous on burning, the mass being finely ground, so that after burning it will take a good layer of glaze. In an example, 50 parts by weight of refractory clay, 30 parts of burnt refractory clay, and 20 parts of kaolin are finely ground, soda is added, and the article cast. The article is twice burnt, the maximum temperature being 1280–1320° C.

9041. **Wilkinson, G.** April 17.





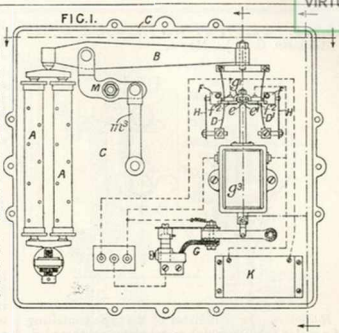
Thermostats.—A capsule 1, Fig. 2, containing salt water is arranged in contact with the wall of a water-heater, oven, or other closed vessel, and operates a gravity-controlled mercury-tipping switch 4. The mercury container is filled with inert gas, and has a porcelain partition 16, Fig. 4, to take the spark. The capsule bears against an adjustable screw 2 on a pivoted bracket 3 carrying the container. The water-heater shown has a double casing 5, an inlet 7, an outlet 8, an air-relief pipe 10, and a tube 9 in which an electric heater is inserted. The thermostat may also be arranged for cooling purposes. Specifications 18,265/05, 13,334/11, and 17,286/11, [*Class* 38 (v), Electric switches &c.], are referred to.

9140. **Prim, A. W.,** and **Roper, F. W.** April 18.

Thermostats.—An expansion member controls the movement of one or more contacts, and also operates electro-mechanically one or more weights or springs to ensure a good contact. As shown,

one or more zinc cylinders A are connected with one arm of a lever B, the other arm of which operates two bowed springs D, D^1 carrying contacts e, e^1, controlling the circuit through a solenoid g^3. Pivoted weights F, assi-ted if required by adjustable springs H, bear against the springs D, D^1; when the contacts e, e^1 are opened by the contraction of the cylinders, a bridge g^1, carried by the core of the solenoid g^3, falls, and engages with prongs f^2 on the weights to relieve the pressure on the springs. When the contacts are closed, the bridge is lifted from the prongs, to allow the weights to assist in maintaining contact. The lever B is carried on a lever M pivoted to the frame C and connected at one end with a link m^3 to compensate for the expansion of the frame. The contacts e, e^1 are shunted by a non-inductive resistance K. The core of the solenoid g^3 opens a switch G against the action of a spring, and controls the insertion of resistance in the field winding of a dynamo supplying current to heaters. Specification 16,317/12 is referred to.

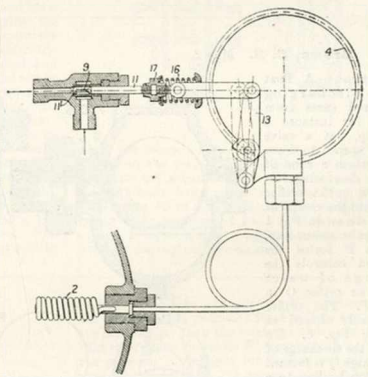
FIG. 1.



9269. Soc. Anon. des Etablissements Delaunay Belleville. June 15, 1912, [*Convention date*].

Thermostats.—A Bourdon tube 4 is connected through a lever 13 with a piston valve 11 controlling the flow of liquid fuel or water through a port 9 of uniform width, the valve moving in a path parallel to that of the end of the Bourdon tube. The apparatus may be used in a torpedo driven by a turbine supplied with a mixture of gas and steam from a generator. The fuel pressure is compensated for by a spring 16 adjustable by a nut 17. The tube 4 is connected with a coil 2 in the chamber under control, and containing vaporizable liquid.

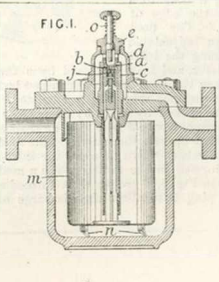
The Specification as open to inspection under Section 91 (3) (*a*) refers to Specification 26,197/12.



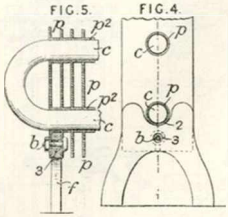
9874. Geipel, W. April 26.

Steam-traps.—A trap has a discharge-valve casing which can be removed so as to leave the valve exposed at some distance above the cover of the trap. As shown, a central pilot valve operated by the movements of a bucket m controls a main valve b, the seat a of which is carried by a cylindrical part c connected to, or forming part of, a removable casing d. The pilot valve has a pin-and-slot connexion with the main valve. A spring-controlled plunger o is fitted for opening the valve b by hand, and means may be provided for holding the valve in the open position. In order to cause the valve to rotate at each operation, feet n are provided on the bucket to engage with the bottom of the trap.

FIG. 1.



10,271. Golby, F. W., [*Neiman, A. B., and Adamson, C. M.*]. May 1.



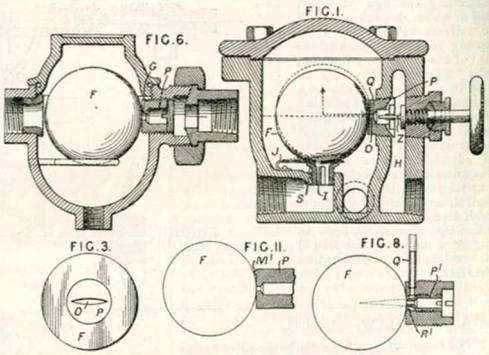
Radiators.—In a radiator of the type consisting of a coiled tube on which metal plates are threaded, the separate turns of the coil passing through holes in the same plate are supported on feet attached to the plates. The plates *p* are provided with collars *p*³ serving as distance-pieces and are threaded on the pipe *c*. The feet *f* are formed as shown, with a semicircular seat 2 in which the pipe *c* rests. The feet *f* are secured between two of the plates *p* by bolts *b* passing through holes 3 in the feet *f*, the holes 3 being larger than the bolts *b* to allow for adjustment.

10,384. Capitani, I. de. May 9, 1912, [*Convention date*]. *Void.* [*Published under Section 91 of the Act.*]

Non-conducting coverings for heat.—A heat-insulating material is formed by mixing steamed animal hair with agglomerating-material and compressing into moulds to form blocks or sheets. In the case of pipe coverings, the pipes may be powdered with asbestos powder mixed with fossil flour before the application of the block.

10,383. Brown, C. S. May 2.

Steam-traps.—A float trap for discharging liquids and gases from vapours, for instance a steam-trap, has a valve and seat shaped to form between them a zone of pressure decreasing towards the outlet orifice to facilitate the escape of air. As shown in Fig. 1 for use as a steam-trap, the float F forms the valve and controls the discharge of water through an orifice O in a plug P. The orifice is preferably shaped as shown in Fig. 3. To facilitate the discharge of air, a passage Q is formed in the plug leading to a point near the edge of the orifice. The float rests on an adjustable stop S forming the inlet from a radiator, and may be raised by a thermal device J when the liquid to be discharged becomes cool, as for instance when air is admitted. The valve may be opened by hand by means of a plug Z. The thermal device J may also be disposed in the outlet H to operate the plug Z. The float also acts as a non-return valve to close the inlet I if a vacuum is formed in the radiator. In a modification shown in Fig. 6, a groove G is formed at the edge of the plug P to allow the discharge of air.



The face of the plug may in this case be flat. In another modification shown in Fig. 8, an air pipe Q extends upwards into the trap, and an annular passage R^1 for the air is formed round an adjustable outlet nozzle P^1. In another arrangement, the plug has a flat seat and is screwed directly into the radiator. In the apparatus shown in Fig. 11, the float rolls about a projection M^1 on the plug P. In another arrangement, a valve is pivoted and is connected by a rod with the float.

10,555. Arndt, M. May 5.

Thermostats; radiators.—An adjustable thermostat is arranged in a casing through which the heating-medium passes from a radiator so as to control an outlet valve, the medium passing freely into the radiator at the other end. As shown in Fig. 3, a capsule *e* containing a liquid is placed in a casing *a* at the outlet of a radiator H, the inlet of which is connected with the pipe I. In the arrangement shown in Fig. 5, the capsule *e* is adjusted by means of a screw S, which has a handle W and a pointer *y* moving over a scale X^1, and bears against a cup *n* fitting loosely in a ring *o* supported on a spring F^1, which rests on a projection in the casing. A stem *g*, to which the capsule *e* is secured, passes into the cup *n*, and has a collar *p* and a spring F^2 which bears against the ring *o* and a disk *r* on the stem. If the temperature of the heating-medium is above that at which the thermostat has been set, the valve *v* is closed, and the stem *g* moves into the cup against the action of the spring F^2. Baffle-plates are provided to cause the medium to pass around the capsule. In another arrangement shown in Fig. 6, the adjustment stem 24 has a screwed hollow part 20, in which a single spring is arranged, which bears against two disks 17, 18 to prevent the spring from turning when the stem 24 is adjusted. The disk 17 bears against the stem 12 on the capsule, which, in the form shown, is closed by two caps 8^a, 8^b. The scale has an abutment pin 31 and a pin 42 for securing the pin in any position. The stem 24 has a passage 25 closed by a screw 33 to allow the escape of air. An adjusting-ring 40 is placed on the stem 24 to facilitate setting when the parts are assembled, the pointer 29 indicating the maximum temperature when the ring 40 and the surface 41 of the casing are in contact. The casing is in two flanged parts I, II, secured by a cap 39, a metal ring and packing being interposed between the cap and the flanges.

FIG. 3.

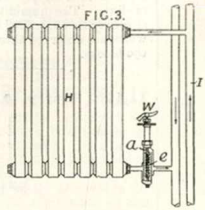


FIG. 6.

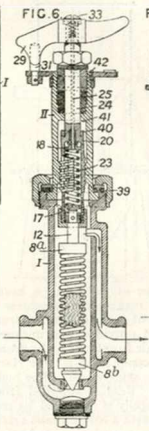
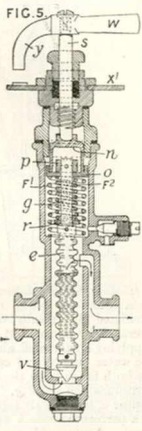
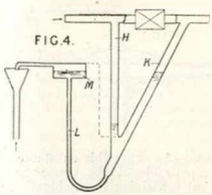


FIG. 5.



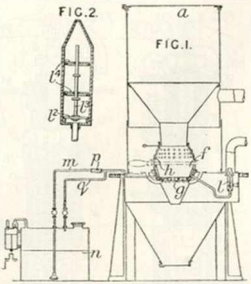
10,590. Castellazzi, A. May 5.

FIG. 4.



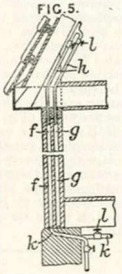
Heating by circulation of fluids.—The supply of heat to a steam heating-system is regulated, and the heat given off by the various radiators equalized, by cutting off the steam supply periodically. When the steam has been admitted to the system for such a time that the pressure in the radiators is that of the atmosphere while that in the piping is slightly higher, the steam is shut off, the steam in the piping then expands into the radiators, and the inlets to the radiators further from the boiler are made larger than the inlets to those nearer, so that the further radiators fill more quickly. When the pressure throughout the system has fallen to atmospheric pressure, the steam supply is opened again and fills the system, filling the radiators nearest the boiler first. This is effected by a valve operated by a cam and lever. The cam is made adjustable so that the working of the apparatus can be regulated. To prevent the pressure from becoming excessive when the steam is cut off, the device shown in Fig. 4 is provided. A forked pipe H, K forming a water-seal and opening on the two sides of the cut-off valve communicates by a pipe L with a reservoir M of such capacity that the water-level therein is not much altered by fluctuations in the pipe H. The head of the water in the reservoir M above the junction of the pipes H, K gives the greatest pressure allowed in the boiler.

10,799. Jackson, W. J. Mollersh-, [*Des Mesnard-, B. A. F. G.*] May 7.



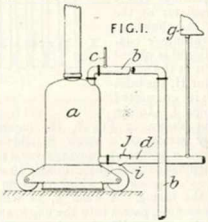
Heating by circulation of fluid.—In a heating-installation in which combustion products are circulated by means of an injector, normally operated by steam, but provided with means for supplying compressed air for starting, the draught, the water supply, and compressed air for starting are both taken from the same vessel. The boiler *f* surrounds the grate *g*. Fuel is supplied from a hopper *a*, and the air supply is regulated by means of a perforated cone *h* with a hit-and-miss arrangement. A removable grate can be inserted between the cone *h* and the boiler to allow of the grate *g* being cleared. Air is drawn through the fire and forced through the heating-system by an ejector *l*. The boiler is connected by pipes *m*, *q* with a tank *n* containing water and compressed air. The pipe *m* extends to the bottom of the tank *n* and supplies water, and the pipe *q* opens at the top of the tank and supplies air. The construction of the ejector *l* is shown in Fig. 2. A rod l^3 controls the orifice of the ejector and is moved by the pressure of the working fluid on a disk l^2. As it rises, it lifts weights l^1 in succession, its motion being thus controlled.

11,025. Nyström, J. A. A. May 9.



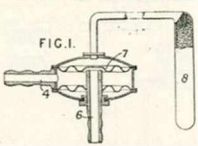
Radiators.—In a wall built of hollow blocks having the openings communicating so as to form two or more isolated systems of air spaces *f*, *g* throughout the wall, the air spaces are connected at the top and bottom to pipes *h*, *k* controlled by valves *l*. The pipes *h* are preferably connected to a chimney, and the pipes *k* to a cellar so as to cause an upward draught in the air spaces, which draught may be increased by a fan or exhauster. The wall may be heated by connecting some of the pipes *k* to a supply of hot air or other heating-medium. The humidity of the air in the spaces *f*, *g* may be controlled by the aid of hygrometers, which are observed through glass panes inserted in the blocks.

11,105. Burry, A. Pullen-. May 10.



Heating by circulation of fluids.—In systems for heating by hot water in which the radiators &c. are below the level of the boiler and a non-return valve is placed in the return pipe, a pipe open to the air leads from the rising pipe. In the arrangement shown, a rising pipe *b* leads from the boiler *a* and is provided with a pipe *c* open to the atmosphere. Make-up water is introduced into the return pipe *d* from a tank *g*. In the return pipe *d* is a non-return valve, and close to the boiler side of this valve may be a well *i* for collecting sediment, and an inspection window *j*. The apparatus is stated to be specially applicable for use with the hot-house described in Specification 20,222/12, [*Class* 20 (i), Buildings and structures, Kinds &c. of].

11,39[illegible]. Steenbjerg, P. J. May 15.

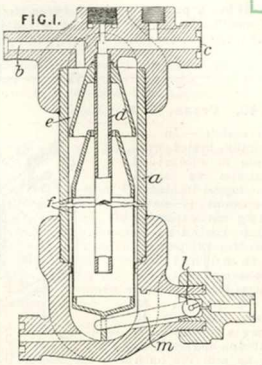


Thermostats.—An expansible substance which is not itself vaporizable at the temperature to be worked at, but containing in combination or in a state of absorption gases that are freed on heating, for example, metallic halogen salts that have absorbed ammonia. In the apparatus shown, the flow of heating-gas in the pipes 4, 6 is regulated by the pressure of the gas generated in the receptacle 8 on the diaphragm 7.

11,733. Woollard, B., and **Brotherhood, Ltd., P.** May 20.

Steam-traps.—Relates to apparatus for separating liquids from elastic fluids, more particularly water from compressed air, of the type comprising a float chamber *a* and means such as a baffle *e* whereby liquid is deflected to the outside of the float *f* and raises it to operate a liquid-discharge valve *l* at the bottom of the chamber. The invention consists primarily in the use of a cylindrical or spherical valve *l* connected to a lever *m* engaging the float and kept on its seat by the pressure in the float chamber. The inlet *b* for compressed air and liquid, and the outlet *c* for compressed air, are preferably formed in a single casting as shown. The compressed air preferably passes to the outlet by way of a pipe *d* depending into the interior of the float.

FIG. 1.

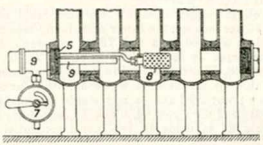


11,843. Hall, I. May 21. *Drawings to Specification.*

Thermostats.—The gas burner of a furnace for melting, cleansing, and casting into ingots type or other metal is regulated by the thermostat described in Specification 21,072/12.

11,901. Revy, J. W. May 21.

Radiators.—A radiator of the type comprising a number of units connected above and below and containing water to be heated by a jet of steam is provided with a screw plug 5 carrying a steam boiling-nozzle 8, preferably of the kind described in Specification 22,089/07, and a thermostatic device 9, preferably of the kind described in Specification



686/08, for regulating the supply of steam. A hand control-valve 7 is also provided.

12,170. Ruud, E. May 24.

Thermostats.—A flat-iron is provided with means for automatically regulating the supply of gas to a burner. As shown in Fig. 4, the base 13 forms the expansion element of a thermostat, the other element consisting of a rod 15 of porcelain adjustably mounted in a cavity in the base. One end of the rod 15 is connected by an adjustable screw 34 with one arm 33 of a lever, the other arm 30 of which has a forked end 35 engaging with a lever 26 mounted in a bearing 25. A tongue 27 on the lever engages with a valve 21, the valve seat being formed on a fitting 18 screwing into a tube connected with the burner 9. Expansion of the base causes the valve to be moved towards its seat by spring 22. A screw 36 is adjusted to prevent complete closure of the valve. The valve and levers are enclosed in a shield 37. The adjusting-

FIG. 4.

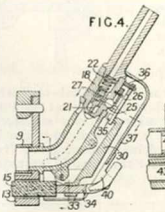


FIG. 9.