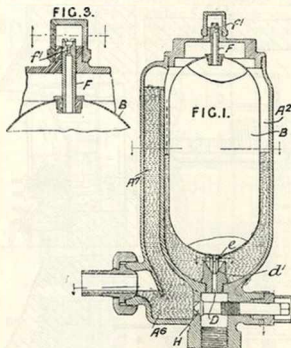


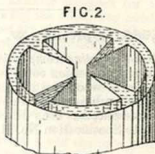
into the float chamber A^2 , and when sufficient has collected to raise the float B , escapes into the discharge pipe D . Air in the pipes is driven similarly through the water in the pipe A^2 into the float



chamber and escapes round the loose-fitting guide F , through the hole f^1 into the float, and thence through e to the discharge pipe. A leakage passage, such as a groove d' in the valve face or seating, is provided at the base of the float chamber to allow the condensed water to flow away when the valve is out of action. In a modification, there is a means of controlling the discharge of air through F by varying the number and size of the apertures leading to f^1 ; and, in a further modification, the discharge of air and steam is controlled thermostatically. The water can be emptied from the space A^2 by means of a screw valve H .

11,372. Fischer, A. H. E. May 15.

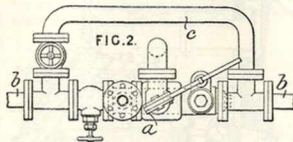
Boilers.—The interior surface of the water jackets or of the flues has deep corrugations so that thin longitudinal water-spaces project inwardly towards the centre of the heating-chamber or flue.



11,461. Metcalfe, J., Metcalfe, J. C., and Metcalfe, R. D. May 16.

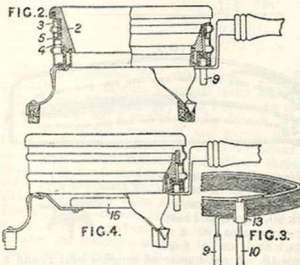
Heating water.—An injector device a for heating

water is inserted in the delivery pipe b of a pump or other feeding appliance. The pipe b is also provided with a branch c , forming a by-pass. A



loaded valve may be fitted in the branch c to prevent excessive pressure in the main when the heater is in operation. The heater is preferably similar to the auxiliary live-steam injectors described in Specification No. 20,222, A.D. 1899, [*Abridgment Class Injectors &c.*].

11,657. British Thomson-Houston Co., [General Electric Co.]. May 18.



Heating by electricity.—Relates to an electric heating or cooking device consisting of a heating frame or ring within which the portion of the device to be heated fits closely. A ring, surrounded by a heating-coil 3, has an inner tapering surface 2 within which fits closely a cooking or other utensil having the lower portion tapered to correspond with the surface 2. The heating-coil which is shown detached in Fig. 3 may be separated from the ring by a layer 4 of mica, rings 5 of insulating-material further binding the coils together. The terminals 9, 10 project below the casing near the handle thereof, the terminal 10 being insulated by a sleeve 13. The apparatus may be fitted with a separate auxiliary heating-device, such as the gas burner 16, shown in Fig. 4.

11,686. Wakefield, G. May 19.

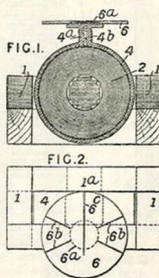
Non-conducting coverings and compositions.—A non-conducting composition for steam-pipes, boilers, and the like consists of a mixture of 40 per cent clay, 20 per cent tar, and 40 per cent horse-dung, old ropes, matting, or other materials such as hemp, flax, or coco-nut fibre. The materials are ground together with water in a mortar-mill, and the paste so formed is applied in layers to the surface to be protected. A single intermediate layer of hair-felt may be inserted.

11,970. Remig, M., and Remig, J. May 22. Drawings to Specification. No Patent granted (Sealing fee not paid).

Thermostats &c.—The condensation and freezing of moisture on shop windows are prevented by causing a stream of cold air to traverse the inside surface of the glass whenever the temperature inside is greater than that outside. Two fans on the same shaft are driven by an electromotor which is started when the circuit is closed by a mercury thermometer fixed inside the window. One fan draws air from the exterior and forces it through a slit pipe at the bottom of the window, thus driving the warm air into a funnel at the top whence it is drawn off by the other fan.

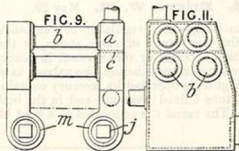
12,333. Berry, A. F. May 26.

Heating by electricity.—In electric heating-apparatus of the induced-current type, the part of the permanently-closed secondary circuit which lies outside the core is so constructed that the induced current passes back to the portion inside the core along a path practically parallel with and close to that which it takes on leaving, thus minimizing wasteful induction effects. The primary circuit 2 is wound round the central member 1^a of the core 1. Outside this is wound a single turn 4 of the secondary conductor, the two ends of which are connected to two metal strips 4^a, 4^b which are electrically connected to a circular plate 6, serving as a support for the article to be heated. The plate has a slot 6^a, so that the inductive effect of the current passing thus in practically parallel parts is greatly minimized. The slots 6^b cause the current to pass through the central portion 6^c of the plate, which is recessed so as to present a smaller sectional area to increase the heating effect. The slots may be in other directions to effect these purposes. In a modification, the



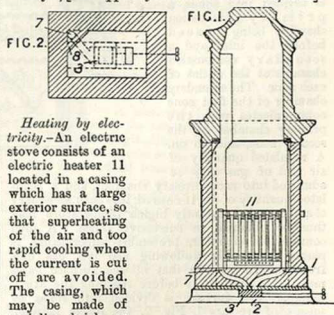
secondary circuit 4 is formed in two parts both of which have strips 4^a, 4^b for connexion to the hot plate. In this case, a slot may extend across the hot plate so that the adjacent-ports of it carry current from the two parts of the secondary circuit in opposite directions at the same time. In another form, the heating-portion is formed of two superposed plates insulated from one another except at one end, the upper of which may be slotted, the current passing from one plate to the other.

12,341. Kitchen, J. and Brown, H. C. May 26.



Heating water.—Kitchen range and like boilers comprise horizontal tubes b, of large diameter, connecting end boxes a, one or both of which have cross-partitions c arranged to lengthen the path of the water circulating through the boiler. Sediment-collecting pockets m may be fitted below the level of the grate, cleaning being effected by removal of screwed plugs j. The Provisional Specification states that horizontal chambers and vertical tubes, or both vertical and horizontal tubes, may be employed.

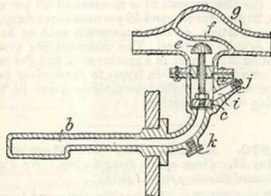
12,488. Herde und Ofenfabrik Commanditges. F. A. G. Gutjahr & Co. May 9, [date applied for under Patents Act, 1901].



Heating by electricity.—An electric stove consists of an electric heater 11 located in a casing which has a large exterior surface, so that superheating of the air and too rapid cooling when the current is cut off are avoided. The casing, which may be made of majolica, brick, or like insulating-material, is divided into two unequal compartments by a wall 8. The compartments

communicate with the external atmosphere by separate passages 1, 7. These passages, which may end in a lower common aperture, may be closed by a slide 3 moving in guides in an iron bed-plate. When the current is switched on, there is free communication between the compartments and the external atmosphere to cause a circulation of the air and to allow the excess of air in the stove, due to expansion, to escape. When the stove is slightly heated, the slide 3 closes the passages. The upper part of the stove is preferably filled with fire-bricks.

which, as the mercury expands or contracts, rises and falls causing the valve *e*, as shown in the Figure, to be operated by mercury contained in a closed tube *b* fixed with one end in the boiler or vessel. The vessel *e* is connected to a float block *c*



12,494. Briggs, W. M. May 29.

Thermostats.—In a regulator for automatically controlling the supply of gases, steam, or the like for heating a boiler or other vessel in accordance with the temperature therein, the valve *e*, as shown in the Figure, is operated by mercury contained in a closed tube *b* fixed with one end in the boiler or vessel. The vessel *e* is connected to a float block *c*

or other heating-vessel. The tube *b* is supplied with mercury by the opening *i* when the plug *j* is removed, a plug *k* being fitted for drawing off the mercury.

12,523. Dennis, W. B. May 29.

Heating apparatus.—Relates to an improved process and apparatus for treating materials by the aid of heat, the heat current being caused to flow through the receptacle containing the material to be treated from the cooler to the hotter portions, and the material being discharged from the hotter part of the receptacle. The receptacle or furnace is divided into zones, a primary combustion chamber being placed before the inlet and a secondary combustion chamber at the outlet of each zone. The secondary chamber of the first zone communicates with the primary chamber of the second zone, and so on. A regulated quantity of air and of gas may be admitted into each primary chamber, and a regulated quantity of air, if desired, into each secondary chamber. A constantly higher temperature may thus be obtained in successive zones. A final combustion chamber, preferably superheated, is placed, preferably following the last gas exit from the furnace, so that all the furnace gases must pass through it before reaching the atmosphere. The furnace is divided into zones by means of fire-bars 1, Fig. 2, the spaces between adjacent fire-bars in the same row being filled by pivoted hollow fire-bars 2. Water may be admitted

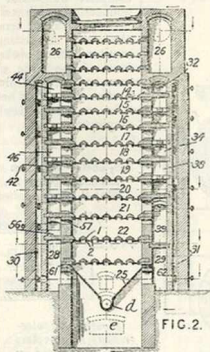


FIG. 2.

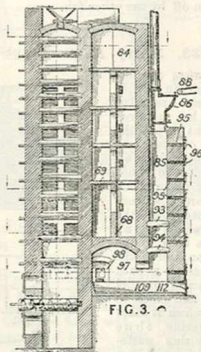


FIG. 3.

to the hollow fire-bars. The ends of the latter fire-bars project through the furnace walls and are provided with arms connected by links to horizontal bars, one bar being provided for each row of fire-bars. The horizontal bars may be raised or lowered from a platform at the top of the furnace, so that the pivoted fire-bars rotate and allow the charge to drop from one zone into the next below, thereby also stirring and mixing the charge. A discharge hopper 25 below the lowest grate is provided with a conveyor *d*. In the arrangement shown, the four upper zones are arranged as drying

and preliminary heating zones, the furnace being partly surrounded at this part with chambers 26, provided with baffle-plates, through which the waste gases pass, the chambers serving as dust collectors. On each side of the heating-zones 14-21 are vertical channels 28, 29 outside of which are vertical air flues 30, 31. The channels 28, 29 are divided by horizontal partitions into primary combustion chambers such as 32, 34, 42 and secondary combustion chambers such as 44, 46, 38. The floor of each secondary chamber is made of chequered brickwork to allow the gases to pass into the primary chamber immediately below it. An opening extends from each primary chamber through the furnace wall, the opening being opposite a door in a dust shoot which extends down the front of the furnace, the dust from the primary chamber being raked into the shoot when desired. The openings from the air flues and from gas-supply flues into the primary chambers are controlled by valves. Air may be admitted as desired from the air flues. The temperature of the final heating-zone is preferably maintained above the boiling point of any volatile metals present in the ore. The current of air and gas passes from the zone 21 into a superheating or final combustion chamber 30. To ensure that the temperature of the latter chamber is kept high enough, an additional supply of air and gas is admitted thereto. The gas enters the combustion chamber 56 from one of the gas supply flues and passes through a small opening 57 in the upper part of the first cooling-zone 22. Fresh supplies of air and gas may also be introduced through valved passages into the chamber 39. The main air supply enters the furnace through an aperture *e*, has access to the spent ore pit through openings 61, 62, and passes to the flues 30, 31. The greater part of the dust settles from the gases in the chamber 39, and the gases then pass into a dust collector divided into a series of chambers by baffle partitions 68, 69, Fig. 3. The top chamber 84 communicates with the chambers 26, Fig. 2, surrounding the drying-zones.

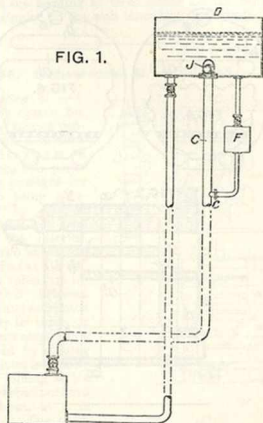
12,701. Russell, J. N. May 31.

Heating buildings &c.; heating water.—In hot-water circulation apparatus for warming or domestic supply purposes wherein an accelerating-device is interposed in a by-pass circuit connected at both ends with the main or gravitation circuit of the heating cycle, the water delivered by the accelerating-device is prevented from returning thereto until it has passed again through the heater. As shown, the accelerator F draws water from the rising main C at a point *c* above the radiators and delivers it to the tank D. To prevent the accelerator from drawing water from the portion of the main C above the point *c*, a non-return valve J is inserted in the main C, preferably at its entrance to the tank D. The accelerating-device may be a pump supplied with steam from a steam generator, heated by the same fire as that which heats the hot-water boiler.

(For Figure see next column.)

12,701.

FIG. 1.



12,718. Minck, P., and Bremer Baumwollwerke Ges. May 31. Drawings to Specification.

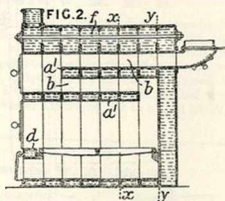
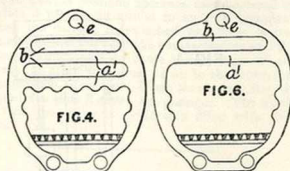
Non-conducting coverings and compositions are made from the amorphous substance obtained by separating, by means of a special opening and sifting apparatus, the fibrous material from cottonseed hulls.

12,737. Cotton, G. June 1.

Heating water.—A sectional boiler in which water circulates below the ash-pit is constructed as shown in Fig. 2 in longitudinal vertical section, in Fig. 4 in vertical transverse section on the line *x-x*, and in Fig. 6 in vertical transverse section on the line *y-y*. The sections are preferably circular and are provided where required with feet. The front section embodies the flue, furnace, and ash-pit openings and the hollow dead-plate *d*, and carries the doors, the rear section being provided with the flue out-let. Certain of the sections are provided with cross-passages *a'* so as to form the flues *b*. Apertures *e* allow the water to pass from one section to another. Tie-rods *f* and clamping-bolts are provided. The boiler may be self-supporting and all brickwork dispensed with. As shown, the crown and sides of the furnace may be corrugated.

(For Figures see next page.)

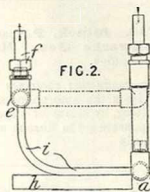
12,737.



12,890. Craven, E. June 2.

Heating water.—

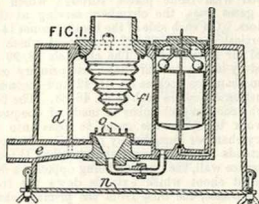
A boiler for a domestic fire-grate is constructed with back and front horizontal pipes *a*, *e*, forming distributing and draw-off pipes, connected by a series of parallel pipes *i*. In a modification, the pipe *e* is carried horizontally to the back and the discharge pipe *f* fitted to it there as shown in dotted lines in Fig. 2. In a further modification, the pipes *i* are carried up at the back as well as at the front, and the horizontal pipe *a* is on a level with the pipe *e*. Bars *h* are fitted in each case under the tubes to act as feet.



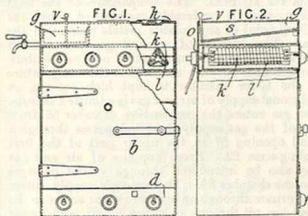
12,901. Cobb, E. G., and Cobb, W. F. June 2.

Heating by chemical action.—A carburettor for an internal-combustion engine is provided with a jacket containing water together with lime, phosphorus pentoxide, or similar substance. Fig. 1 is a section showing the jacket *d*. Suitable exits for vapour from the acet are provided and openings

at the top for introducing lime or the like. The residue is removed by unfastening the bottom *n*.



13,032. Cripps, R. H. June 5.

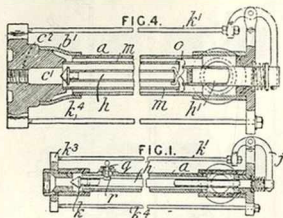


Heating by electricity.—An electric heating and cooking stove consists of an oven *b*, heated by coils beneath it, and of a boiler *g* and hot-plate *h* which are placed at the top of the stove and heated by coils *k* fixed above the oven. The coils are contained in drawers *d* on the outside of which switches are mounted. Each coil is wound upon a frame *l* of insulating-material, such as uralite. The frame consists of three strips which are arranged at angles of 120 degrees and are provided at the ends with contact-strips fitting between spring contacts *o*. The boiler is provided with a hinged dividing-plate *i*, which is raised or lowered by a rod *v*. The plate, by preventing convection currents, enables the mass of water heated to be varied.

13,077. Cleland, J., and Stewart, J. C. June 6.

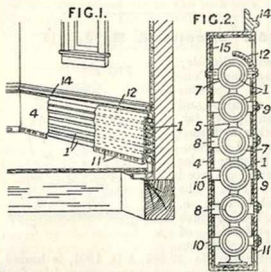
Steam traps.—Relates to improvements in steam traps of the type described in Specification No. 25,612, A.D. 1899. The outer end of the inner tube or rod *h* abuts against one end of a bent lever *j*, the other arm of which is connected by an adjustable tie-rod *k* to a projection *k* on its casing. This rod acts to force the valve *k* on to its seating when the outer tube *a* expands. A screw *g*,

which may be fitted with a saddle-piece *r*, enables the tube *h* to be sprung aside to allow steam to pass through the trap. In a modification, Fig. 4, an additional tube *m*, acting upon levers *o* which



pivot against a piece *h'*, by its expansion assists to close the valve. An additional tie-rod *k''* with or without a separate lever *j* may be fitted. The valve opening *c'* may also be made larger than the passage *c* which admits the water, the coupling *b'* being then tapered as shown.

13,106. Greene, E. J., and Robinson, D.
June 6.

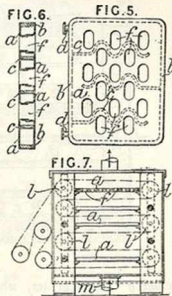


Heating buildings.—A series of superimposed hot-water or steam pipes 1 is supported by pillars 5 having collars 7 and side arms 8 inside a casing 4 which extends partly or wholly round the room. The plaster at the foot of the wall is removed and the casing is let into the casing so formed. The casing is lined with fire-proof substance 15, which may be arranged to be supported by shoulders formed on the arms 8 when they are riveted or screwed to the outer casing as at 10, 9, Fig. 2. The casings and pipes are made in sections. At the foot of the casing apertures 11 are provided for the entry of air, which is then warmed and passes out

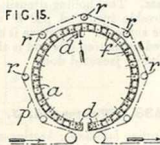
through the space between the front of the casing 12 and the beading 14 fixed either on the top of the casing or on the wall immediately above it.

13,335. Schewczik, S. A. June 9.

Heating air.—A heating plate for drying fabrics consists of a hollow chamber formed between two plates *a*, the passages for steam being provided by straight or curved iron bars *c* in the interior. The two sheets are perforated and short tubes are inserted between them and connected rigidly to them, or the openings are formed by dishing the plates internally and joining the two dished portions as shown at *f* in Fig. 6. The openings may be of any shape. Ports *d* are provided in the edge bars *b* for entry and discharge of steam. These special plates are shown used in a stretching-machine at *a* in Fig. 7. Air is drawn up through



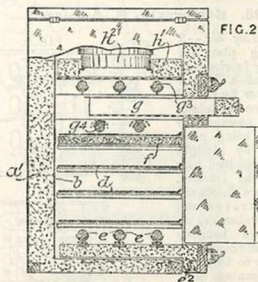
a tube *m*. If necessary, to add to the heating effect, plates may be superposed at a short distance apart. The "plate" may be made in cylindrical form as in Fig. 15, and either the fabric *p* is led round it as shown by means of rollers *r*, or the cylinder is made to revolve on its axis, in which case the fabric is led round without the use of special rollers.



13,391. Smith, D. C. June 11.

Heating by electricity.—To avoid loss of heat, the entire inner and outer walls *a* of the casing and the doors of an electric cooking-stove are arranged and constructed without any intervening metallic contacts, terminal pieces, or the like. The inner walls *b* of the stove are formed of a non-combustible and non-conducting material, such as uralite, packing-material *a'*, such as asbestos, being inserted between the inner and outer walls. In the type of stove shown, the roasting-compartment, which contains the trays *d*, is directly heated by the heaters *e* each of which consists of a naked coil

wound on a support of earthenware or the like. The coils are mounted on an insulated removable pad e^2 . Separated from the roasting-compartment, by a divisional deflecting-pad f is a removable box

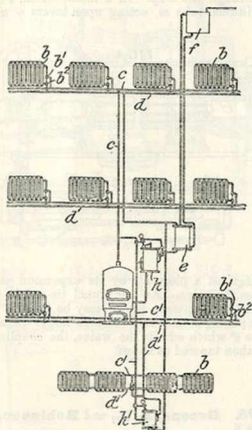


griller g . This griller, which has an insulated front wall and a grid bottom, is heated by upper and lower coils g^1, g^2 , mounted on removable wire frames. The boiling-utensil h^2 is supported in a removable insulated pad h^1 mounted on a wire-gauze support. The stove is closed at the top by hinged insulating-lids and is also provided with an insulating jacketed door.

13,438. Westwood, J. W. June 12.

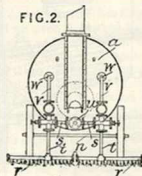
Heating buildings; heating water.—Relates to the steam-heating of buildings, and comprises the circulation through the supply mains of a system of high-pressure steam which is intermittently admitted to and discharged from the radiators or other elements by way of automatically-controlled valves situated respectively at the inlet and outlet ends of the said elements and adapted for simultaneous and conjoint operation. The radiators b receive high-pressure steam through mains c, c^1 , and discharge the steam by way of the mains d, d^1 . The combined mechanical admission and discharge valves with which each radiator is provided are shown at b^1, b^2 , respectively. The result is that, on the discharge of the spent steam and condensation water from the radiator, the admission valve is opened to pass a fresh supply of live steam and that neither the admission nor the exhaust valve is constantly opened. The exhaust steam is collected in the condenser e , which when water-cooled may form part of a hot-water system, so that the heated condensing-water is conducted to a tank f for domestic purposes. From the condenser, the water flows to the receiver h and is passed to the boiler by automatic devices such as a float operating a valve to admit steam to a pump or ejector or to the receiver itself. The radiators below the boiler drain into the receiver h^1 , from which it is

raised to the condenser e by steam from one of the pipes c^1 .



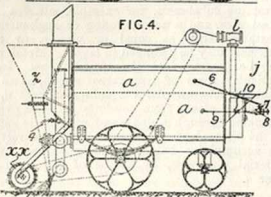
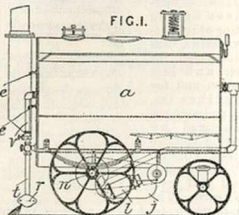
13,551. Thwaite, E. H. June 13.

Heating liquids; boiling-pans.—Consists in apparatus for melting and heating for pitch, tar, or other hydrocarbons, and distributing the same under pressure on road surfaces. The wheeled tank a , Figs. 1 and 2, which is preferably of the form shown in



Specification No. 17,582, A.D. 1901, is heated by an internal furnace and carries pumps l for forcing the hydrocarbons from the reservoir j into the tank and for compressing air in the latter. The discharge is made from one or two spray pipes r , the supply to which takes place through pipes t , which are tapped at s to the tar &c. supply pipe u , and have extensions v entering the tank at points w above the level of the liquid, which may be ascertained by means of pet cocks e . The pipe u may be fitted with a valve for direct discharge, and the pipes v have easily disconnectable flanges for the introduction of a heated rod &c., for freeing them in the event of their becoming filled with solid hydrocarbon. In alternative forms, the reservoir j is placed saddlewise on the tank, and the air

supply is taken directly from the pump to the discharge pipes. Part of the hydrocarbons may be tapped off by a pipe 9, Fig. 4, and valve 10 for



feeding the furnace. The fuel ejector 8 is connected with the compressed air in the tank by a pipe 6 having a valve 7. The apparatus may be motor-driven, and the pumps may be actuated by motor instead of from the wheels, as shown.

13,795. Berry, A. F. June 15.

Heating by electricity.—Relates to apparatus of the type described in Specification No. 12,333, A.D. 1906, and to methods of controlling the heating effects produced. The apparatus consists of a plurality of primary circuits upon a single core or upon separate cores, with corresponding secondary circuits, some portions of which are in permanent electric connexion with one another, thus forming practically one circuit energized in different parts by the primary windings. Controlling means are provided whereby such windings can be connected in series or in parallel, or one or all of them can be put out of action at will, so that different degrees of heat can be produced in the apparatus. In the example shown in Figs. 7, 8, and 9, the core is rectangular, and upon the members 1, 1^a are wound the primary circuits 2, 3 and the secondary circuits 4, 5. The secondary circuit is completed by the hot plate 6 between the strips 4^a, 5^a and the bar 7 between the strips 4^b, 5^b, the current thus flowing in opposite directions in the conductors 6, 7. The hot plate, Fig. 8, is slotted at 6^b and recessed at 6^a to direct the current, as set forth in the above-mentioned Specification. The switch shown as an example in

Fig. 7 operates as follows:—There are four contacts 9, 10, 11, 12 and a stop 13. The contact 9 is connected by a conductor 9^a to one of the supply conductors 14 and by another 9^b to one end of

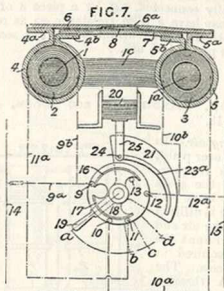


FIG. 8.

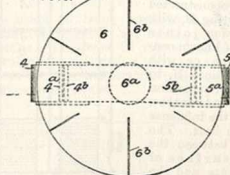
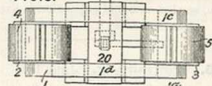


FIG. 9.

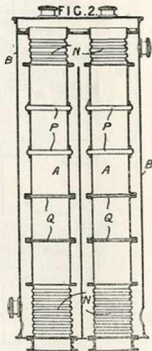


the primary winding 2, the other end of which is connected by a conductor 11^a to the contact 11. The contact 10 is connected by a conductor 11^b to one end of the second winding 3, the other end of which is connected by a conductor 10^b to the contact 12, which is also connected by a conductor 12^a to the second supply conductor 15. The contacts 16, 17 are moved by the insulating plate 18 by means of the handle 19, which can take up positions *a*, *b*, *c*, *d*. When the handle is in the position *a*, the two primary windings are in series; at *b* the winding 3 is short-circuited, at *c* the circuit of the winding 3 is opened, and at *d* the two windings 2, 3 are connected in parallel. When one primary winding is put out of action, a block 20 of iron may be arranged to be forced between the members 1^c, 1^d of the core to act as a magnetic

shunt. This may be effected, for example, automatically by means of the cam-slot 23^c and the forked rod 25 with pin 24, the cam 21 being operated by the switch handle 19. The central portions of the hot plate 6 and the strip 7 may be electrically connected, e.g. by a piece 8 of metal which may have a high resistance, so as to form a by-path for the current when one secondary circuit is put out of use.

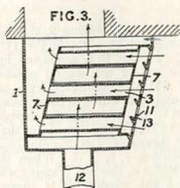
13,892. Dixon, W., and Ross, J. R. June 18.

Heating air.—In gas-producer plant, the high temperature of the gases as they leave the producer is utilized to heat the air and to superheat the steam required in the process. The tubes A through which the hot gases pass are constructed in a casing B, with expansion joints P, Q of known construction or with corrugations N, to allow for expansion and contraction under the influence of the heat. The space between the outer surface of each pipe and the outer casing is made as great as the space surrounding the remainder of the surface of the pipe, so that unequal expansion is avoided.



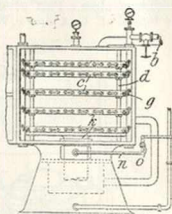
13,895. Foujate, F. June 18.

Heating air.—A ventilator to be inserted in the up-take flues of ranges, stoves, &c. consists of a casing 1, with a removable louvered front 11, and a drawer-like structure comprising a set of tubes 3, connecting two tube plates 7 and enclosed in inner side plates. The hot gases from the stove-pipe 12 heat the tubes 3 and induce a flow of air from the kitchen &c., which is thus relieved of steam, foul air, &c. The louvers 13 catch the soot.



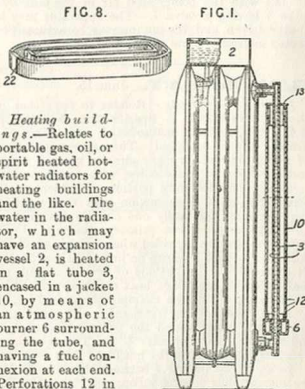
14,001. Czarnikow, C. June 19.

Non conducting coverings and compositions.—Substances having isolating or insulating properties, such as those used for electric and heat insulation and for use against fire, water, and acid are manufactured by subjecting suitable materials to the simultaneous action of heat and pressure *in vacuo*. The material may consist of a mixture of moisture-attracting substances, for example, silicates, such as asbestos, and a waterproofing or agglomerating substance, such as copal or viscose, or these materials may be arranged in layers. Metal parts may be pressed into the treated mass. In the particular form of apparatus shown, slabs are moulded between plates *c*, sliding on bars *d*, and heated by steam from conduits *g*. The oven is evacuated through a pipe *b* and pressure is applied by the piston *k* of a hydraulic press, the valve of the accumulator being gradually opened, as the material contracts, by means of a rod *n* and lever *o*.



14,013. Ofterdinger, H. T. June 19.

Heating buildings.—Relates to portable gas, oil, or spirit heated hot-water radiators for heating buildings and the like. The water in the radiator, which may have an expansion vessel 2, is heated in a flat tube 3, encased in a jacket 10, by means of an atmospheric burner 6 surrounding the tube, and having a fuel connexion at each end. Perforations 12 in the jacket admit air to the burners, and a perforated cap 13 controls the draught. The heating-tube may be outside the radiator, with which it communicates by

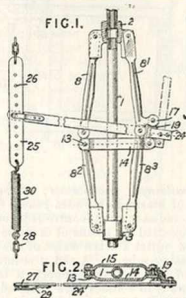


unions, or it may form one of the columns of the same. In the latter case, the burner is provided with a movable piece 22, Fig. 8, to facilitate its insertion into place around the tube 3.

14,019. Lawler, J. J. June 19.

Thermostats.—A special arrangement of levers magnifies the alterations in length of a metal tube due to varying temperatures and operates temperature regulating, indicating, or alarm devices. Four links 8, 8', 8'', 8''', preferably cruciform in cross-section, are knuckle-jointed in pairs to each other and to fittings 2, 3, screwed to the ends of a brass or copper tube 1 exposed to the fluid the temperature of which is to be regulated &c. A pair of metal straps 14, 15 are jointed to the link 8' at 13 and to one extremity of a link 19, the other end of which is pivoted between lugs 17 projecting from the link 8'. Secured to an extension of link 19 is a lever 24, the outer end of which is provided with a flat spring 29 having a projecting pin 27 for engagement with one of a series of holes 26 in a flat plate 25. The latter is connected by chains 28 with the regulating &c. device, a spring 30 being interposed to prevent damage to the linkage in case of derangement of one of the chains. If the apparatus is placed horizontally, the lever 24 is secured to the link 19 so as to take up the position shown in dotted lines. The whole of the joints employed are of the knuckle type to prevent

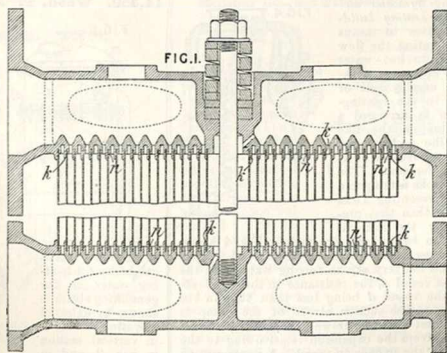
motion in any plane other than that through the links 8, 8', 8'', 8'''. The device is of general application but adaptation to a steam-heated boiler is described, the water circulating through the pipe 1,



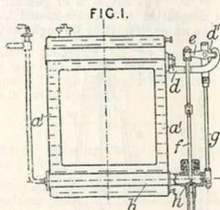
and the chain 28 being arranged to operate a valve admitting steam to the heating-coil disposed in the boiler. The lever 24 might also be caused to control a damper and a furnace door, or to operate an alarm or temperature indicator, through electrical or other means.

14,061. Rayner, T. J. June 19.

Heating gases and liquids.—In surface apparatus of the kind described in Specification No. 20,175, A.D. 1903, in which concentric tubes are fixed in grooves *n* on the top and bottom headers, projecting pieces *k* are formed integral with the faces of the headers on one side of the groove, in order to facilitate the entrance of the tubes into the grooves and to render the joints more secure against leakage.



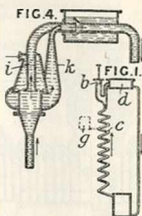
14,179. Platz, H. June 20.



Heating buildings; thermostats; steam traps.—The supply of steam to a steam-heated hot-water "stove" or radiator *a* is controlled and loss of steam is prevented by means of a valve *h*, which regulates the outlet for the water of condensation from the heating-tube *b*. A rod *g* secured to the lower part of the radiator supports a lever *e*, of which one end is in contact with knife-edges *d* on a bracket *d* attached to the upper part, the other arm of the lever actuating the adjustable valve-rod *f*. The differential or aggregate expansion of the radiator and the rods *f*, *g* closes the valve *h* when a sufficient temperature is reached.

14,258. Imray, O., [Schiele, E., (trading as Meyer, R. O.).] June 21.

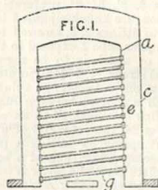
Heating by water circulation; heating buildings.—Relates to means for accelerating the flow of liquid in hot-water heating-apparatus without the employment of valves. In the heating-system is arranged a pulsometer or the like having the suction and delivery strokes of different duration. The longer stroke acts upon a conduit presenting less resistance than that presented by the conduit acted upon by the shorter stroke. Fig. 1 shows one arrangement, in which the piston *b* of a pump has a slow delivery stroke forcing water into the expansion vessel *d*, the resistance in the pipe leading to the vessel *d* being less than that in the conduit *c*. The suction stroke of the pump is rapid, so that water is drawn through the conduit *c*, but not from the expansion vessel owing to the vacuum in the expansion vessel. A compensating or equalizing air vessel *g* may be provided. The pump may have a slow suction and a rapid delivery stroke, in which case the flow through



the system is reversed. The air vessel *g* may be replaced by a siphon pipe. Fig. 4 shows an arrangement in which the flow of part of the water is accelerated, the remainder passing through the central pipe *i*. The pipe *k* through which the accelerated water passes enters the tube *i* axially as shown to increase the flow through the tube.

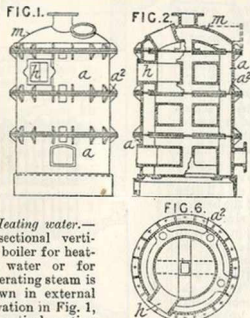
14,471. Russell, W. J., and Sawyer, R. June 25.

Heating water.—Water-heaters of various kinds, including kettles, and portable, kitchen range, and other boilers, are constructed with a double casing *a*, *c* forming a water space *e*, the sides of which are connected by inclined water-circulating tubes *g*.



[Reference has been directed under Patents Act, 1902, to Specifications No. 721, A.D. 1857, No. 236, A.D. 1874, [Abridgment Class Distilling &c.], No. 14,395, A.D. 1891, Nos. 1541 and 9149, A.D. 1892, and No. 13,642, A.D. 1894.]

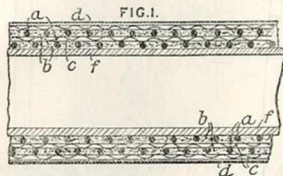
14,559. Wood, T. July 26.



Heating water.—A sectional vertical boiler for generating steam is shown in external elevation in Fig. 1, in vertical section in Fig. 2, and in sectional plan in Fig. 6 through the smoke-outlet *h*. It consists of a series of superposed rings or cylinders *a* which are connected together by bolted

flanges, and by webs a^2 which are attached to the inner cylinders of the sections. Horizontal and vertical waterways pass across the internal space of the boiler. Covers for cleaning-out purposes, fuel-feeds, and smoke-outlets are provided. By removing the dome m , access is obtained directly to the vertical water-ways for removal of scale &c. The boiler may form an independent, or a semi-independent, structure.

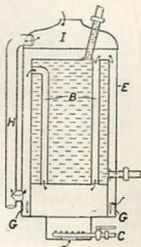
14,616. Reimann, A. June 26.



Non-conducting coverings.—A covering for a pipe f , for example, consists of glass wool b embedded in the convolutions of a strip a of a firm incombustible material, which prevents the compression of the wool by the cover d or a subsequent layer. Separating layers c of pasteboard may be employed.

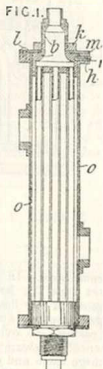
14,864. Barralet, T. E. June 30.

Heating water.—Apparatus for heating water is provided internally with smoke-tubes B and externally with a casing E forming a flue space. An oil or gas burner C is fitted some distance below the boiler. The casing E is provided with outlets discharging directly into pipes H , which lead to a chamber I on the top of the boiler. To prevent back-draught, the pipes H are open at the bottom, or openings G are formed in the casing E . A thermostat, operated by the temperature of the water, may control the supply of gas.



14,872. Gibbs, J. E., and Sheppee, F. H. June 30.

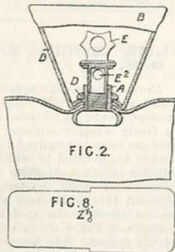
Heating water.—Relates to feed water heaters, condensers, or the like in which the tubes are connected to end sections formed in one piece with the tube plates. To afford access to the tubes, a removable outer casing o is adapted to be drawn over the end sections. To support the high pressure involved when in use on a motor road vehicle without leakage, plates m , having packing-material beneath them, are forced against the sections b by nuts k . The casing o is prevented from turning by set-screws. Screws l prevent the plates m from turning, and tighten the joints between the plates and rings h brazed on to the casing o . Connecting-blocks for the steam inlet and outlet are attached to the casing.



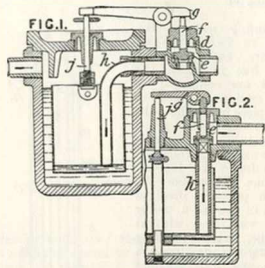
14,883. Leyland and Birmingham Rubber Co., and Timperley, W. June 30.

Hot-water bags.

—The bag is formed from a single sheet of material, such as proofed cloth, having a hole Z , Fig. 8, at the centre for the filling-nozzle. The sheet is doubled and the edges are secured together by binding and taping. The whole is then vulcanized. The filling-nozzle A is secured in position in a manner similar to that usually adapted for securing air valves to pneumatic tyres. This arrangement is shown separately in Fig. 2. The cone or funnel B is provided with an in-turned flange, which is fixed to the nozzle A by a nut D . The stopper E is provided with lateral apertures E^2 , as shown. An ordinary stopper may, however, be employed.



15,213. Ogden, J. E. L. July 4.

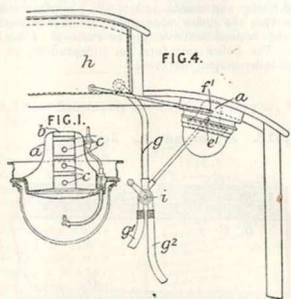


Steam traps.—In steam traps of the floating-bucket type, the lever *g*, by means of which the buoyancy of the float imposes a load on the discharge valve *e*, is arranged on the exterior of the trap casing. In order that the trap may not be influenced by steam pressure, the pressure on the discharge valve and on the float stem is balanced by forming the relative areas of the float stem *j* and the valve *e* in the proportion of the relative lengths of the short and long arms of the lever *g*. The discharge valve *e*, which is preferably of the pop type described in Specification No. 286, A.D. 1904, is located in a chamber *d*. The valve stem *f* abuts against the short arm of the lever *g*. In a modification, shown in Fig. 2, the outlet connexion and the discharge valve chamber are fitted in the cover of the trap. A straight dip pipe *h* is employed.

15,272. Marillier, F. W., and Pearson, G. H. July 5.

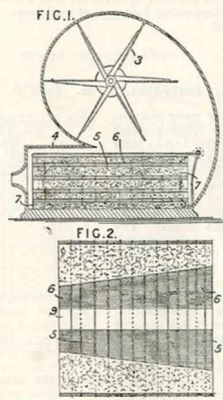
Heating water.—In apparatus for warming the water stored in the supply tanks of railway-carriage lavatories, whereby water may be retained in frosty weather without fear of freezing, the roof gas-lamp is arranged to heat a conveniently-shaped water-vessel to which flow and return circulation pipes are attached. The circulation pipes communicate with the tank and with the water adjacent to the lavatory taps. Fig. 1 shows a section through the roof lamp and the water-heater, and Fig. 4 shows the general arrangement of the system. The water-heater *a* is preferably circular in shape with a central flue *b* which may be formed with cross water-tubes *c* and with corrugated walls. The water from the lamp-heater circulates through the tank *h* and the lavatory pipe *g*, and, if desired, around the cock *i*, by the pipes *f*¹, *e*¹. When a tap is placed in each of the legs *g*¹, *g*² instead of at the junction as shown, the pipe *e*¹ is connected as near the taps as possible, and the legs are preferably connected

above the taps so as to cause the water to circulate near the taps. The base of the water-heating chamber is slightly dished and may be corrugated.



The upper part is made narrower than the base portion, so as to allow of its easily fitting an existing type of lamp.

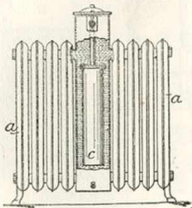
15,490. Whittaker, A. C. July 9.



Heating by electricity.—In apparatus for drying the human hair in which air is heated by an

electric coil, the coil consists of platinoid wire 5, wound on uralite sheets 6 which are kept apart to leave spaces for the air by strips of asbestos 7. The wires on each uralite sheet are kept in place by strips 9, Fig. 2.

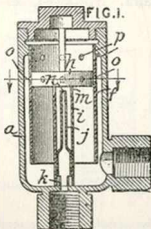
15,500. Binko, L., and Phoenix Electric Heating Co. July 9.



Heating buildings; heating by electricity.—A water-containing radiator for heating buildings has one or more of its loops *a* enlarged to contain one or more electric heaters *c*, which are totally immersed in the liquid.

15,502. Kinealy, J. H. July 9.

Heating buildings; heating by steam circulation; steam traps.—The return valves of steam heating systems are constructed so as to be opened by the impact of the water of condensation. The casing *a* encloses a cylinder *f* perforated with two series of holes *o, p*. Inside the cylinder is a piston *h* carrying a tube *i* which is provided with ports *m* and controls the outlet apertures *k*. An air vent *n*, too small to permit appreciable loss of steam, is formed in the outlet tube *j*. When the end of the cylinder is sealed by the accumulation of water, the extraction of air and vapour through the hole *n* reduces the pressure within it, so that the water is forced against the underside of the piston, which is lifted by the impact and allows the water of condensation to escape. The uncovering of the holes *o* restores the balance, and causes the valve to close. A pin



is provided to prevent excessive lift. In a modification, the cylinder *f* and piston *h* are replaced by an inverted bucket-shaped piece.

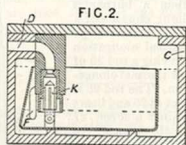
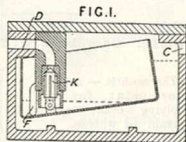
15,533. Bastian, K. July 9. *Drawings to Specification.*

Thermostats.—In a coin-freed apparatus for supplying hot beverages, the temperature is kept constant by the automatic adjustment of a shutter over the wicks of a spirit lamp. This is effected by the lengthening or shortening of a rod which is divided up by a series of thin-walled boxes filled with benzol.

15,788. Cracknell, R. J. July 12.

Steam traps.—

The bucket is pivoted or hinged at one end to the discharge valve, which rises and falls in a guide provided for it, while the bucket is not secured to the fulcrum but comes into contact with it when the valve is shut. Figs. 1 and 2 show the discharge valve *K* in its closed and opened position, respectively: the depending fulcrum *F*, with which the bucket engages when the water rises, causes the bucket to set up a leverage. The outlet from the guided valve is represented at *D* and the inlet to trap at *C*. The fulcrum also prevents the bucket from rising too far.

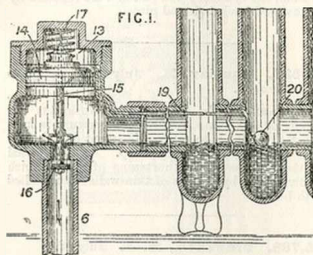


15,899. Goff, F. C. July 13.

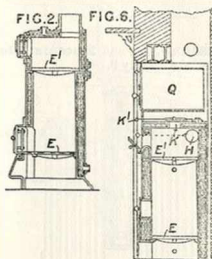
Heating buildings; steam traps.—The discharge of the water of condensation from a steam heating-system is controlled by the level of water within the radiator by means of an apparatus as shown. The discharge valve 16 is normally held open by means of a spring 17, but is closed by the pressure of steam beneath the piston 14. The chamber 13 above the piston communicates with the outlet pipe 6 through a small passage 15, but is filled with steam when a valve in a pipe 19 is opened by the rise of a float 20 or the contraction of a rod owing to accumulation of water, whereupon the piston 14 is forced down by the spring to open the discharge passage.

(For Figure see next page.)

15,899.

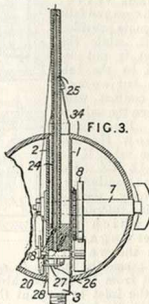


section of the boiler, and Fig. 6 the arrangement when combined with an oven. The sections which heat independent supplies of water are superposed and arranged in such a way that the removable



15,919. Campbell, V. E. July 13.

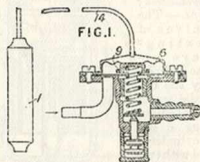
Thermostats.—A thermostat, for applying a brake to a train of wheels, geared to a gas cock, when a burner is alight, consists of a tube 24 of high thermal elongation carrying a rod 25 of low thermal elongation. The rod 25 is bent at 26 and bears against a lever 27 which operates the brake lever, or the rod 25 operates the brake lever by pressing directly against it.



grate may be placed so as to heat either the whole series of boilers, as at E, or one section only as at E'. Flow and return sockets are fitted to each independent section. The sections may be of any shape or material. Fig. 6 shows the case where an oven Q or hot-plate chamber is fitted on the upper section of the combined boiler with the flue K and damper K', an additional flue being shown at H.

16,119. Crump, G. July 17. Drawings to Specification.

Heating by electricity.—The ashpan of a domestic fire-place is fitted with an electric heater, which may be used for cooking &c. when the fire-place is not in operation.



16,323. Junkers, H. July 19.

16,296. Eland, W. E. July 19.

Heating water.—A hot-water boiler is formed of sections constituting two or more independent boilers for domestic, heating, or drying purposes, and heated by a single fire. The boiler may be combined with an oven or hot-plate chamber placed in the flues above. Fig. 2 shows a vertical

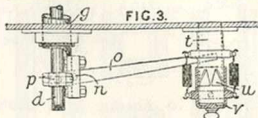
Thermostats.—In thermostats of the type in which the pressure, due to the volatilization of liquid in a container 1, acts through a diaphragm 6, Bourdon tube, or the like upon a fuel-regulating valve 9, e.g. of a gas-cooking stove, the communication between the container and the diaphragm &c. is made through a flexible metallic tube 14 or tubes to enable the container to be placed readily in any desired position. The tube may be helically grooved on its exterior to enhance its flexibility, and it may have a protecting sheath of rubber or of plated or helically-wound wire. The container is fitted with a non-conducting handle.

1906]

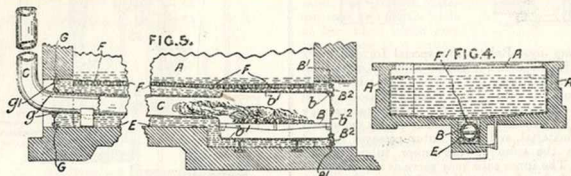
ABRIDGMENT CLASS HEATING.

16,340. Clayton, T. A. July 19.

Thermostats.—A thermostat for controlling the air-admission valve of a sulphur-burning furnace comprises a tube exposed to the furnace heat and an insulated tube within it kept cool by water circulation or otherwise. The free ends of the tubes project through the furnace and carry, respectively, the pivots n , p of a lever o , the long arm of which operates the valve. The furnace itself may take the place of the outer tube.



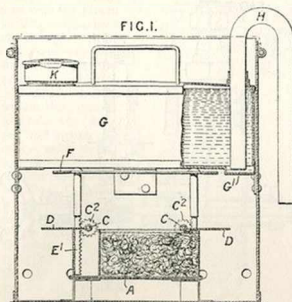
16,757. Smith, R. W. July 25.



Heating water.—Apparatus for heating water in a swimming or other large bath A comprises a furnace B and flue C fitted in a conduit E situated at the bottom of the bath extending from end to end, the conduit having a grating F for covering the flue. The furnace is fitted beneath the bath in a setting comprising a circular casting B^1 built into

the brickwork, with a projecting flange b to which a ring B^2 is riveted, the furnace casing B^1 and also the furnace front b^2 being secured to the ring. Similar means are used to secure the flue at the other end, comprising a casting G , a ring g^1 , and a collar g on the flue.

16,969. Lee, R. E. July 27.



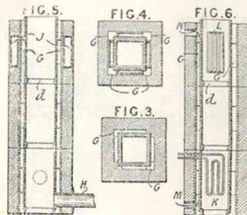
Heating liquids.—Relates to kettles or other apparatus for boiling liquids, of the kind in which the liquid is delivered only upon boiling, and the consequent diminution in weight of the utensil

causes the extinction of the flame. The kettle G , provided with a siphonic discharge pipe H , the short leg of which dips into a depression G^1 , rests upon a vertically movable support F , provided with racks E^1 , engaging pinions C^1 , on shafts C . The latter are spring-controlled, and, when the kettle is removed, or its contents discharged by the pressure of vapour generated, the shafts rotate, bringing the plates D over the burner A ; or means may be provided for turning off the gas supply in the case of a gas burner. A filling-plug K is provided, as shown, or in the discharge pipe, and an alarm may be actuated by the ascent of the utensil. If it is desired to obtain the liquid at a higher temperature than its boiling-point at atmospheric pressure, a regulating-valve may be fitted to the discharge pipe.

17,011. Fouché, F., and Bochet, A.
May 9, [date applied for under Patents Act, 1901].
Drawings to Specification.

Non-conducting coverings.—Ammunition store-rooms and the like are insulated by the circulation through their double walls of air which is cooled in one of the compartments of a double cooler in which water is employed as a cooling-agent.

17,067. Jordan, F. July 28.

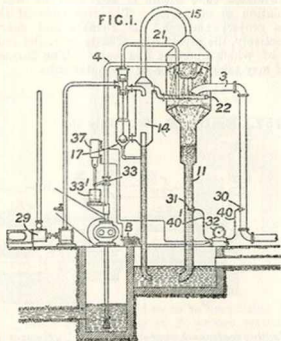


Heating air.—Relates to a special form of block for use in the construction of chimney and ventilating flues and the like. The block, which is of rectangular or other form and of plastic material such as concrete, is provided with an inner passage formed by a metal tube, which is partly embedded in the material, and with outer passages formed between the sides of the inner tube and the block. The inner tube may serve as a passage for the products of combustion of a stove, and the outer passages for heating air, or the inner tube may be used for the passage of heated or cooled air, and the outer passages for ventilation. In the form shown in Figs. 3 and 5, in which the inner tube is connected to a stove-pipe H, and the outer passages are provided with outlets J for heated air, the metal is embedded in the corners, as shown. Two adjacent passages may be connected by openings G in the material. In the form shown in Figs. 4 and 6, the outer passages are provided with outer metal linings, and are all connected by openings G. The inner tube is fitted with a register L for the outlet of air, which may be heated by a steam-pipe K, and the outer passages are fitted with dampers M, N, which may be placed near the floor or ceiling for ventilation purposes. The metal tube projects above the upper face of each block, and fits in a flange *d* formed on the bottom of the tube next above it. It is stated that the outer passages prevent the cracking of the material by excessive heat.

17,331. Helander, A. H. Aug. 1.

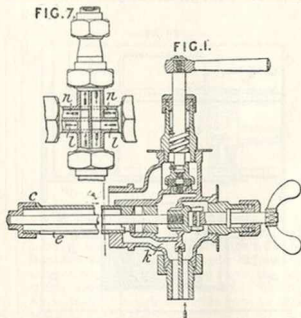
Thermostats.—The supply of cold water to a condenser is regulated according to the variations in the difference between the temperatures of the incoming steam and the outgoing water, a suitable thermostatic device being provided. The condenser to which the apparatus is applied is also provided with means for regulating the vacuum therein. The thermostatic device may consist of two expansion elements 30, 31, placed in the steam pipe 3 and the tail-pipe 11, respectively, and connected by tubes 40, 40¹ with Bourdon springs, carrying contacts which complete a circuit through the battery B when the temperature difference exceeds that necessary for effective condensation. A solenoid 37 is then made to actuate a valve 33 on the

water-supply pipe 4. The reversal of the valve is retarded by a dash-pot 33¹. Alternatively, a pair of thermo-electric couples connected in circuit with a relay controlling the battery circuit, may be used.



Any method of automatically regulating the valve 33 or the feed pump may be adopted, or the valve may be operated manually in response to signals given by the indicator 32.

17,339. Atkinson, R. E. Aug. 1.

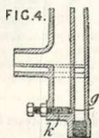


Heating buildings; thermostats.—In radiator admission valves, for example, of the type described in Specification No. 12,852, A.D. 1904, and shown in Fig. 1, the expansible tube *c* is perforated at *e* and

thus serves for conducting away the water of condensation which escapes by way of a supplementary passage *k*. The invention is shown in connexion with a divided single-pipe system, e.g. as described in Specification No. 17,750, A.D. 1905. Suitable fittings are described for connecting the radiator valve with the main pipe. One form employed is described in the last-mentioned Specification. The other is shown in Fig. 7 and is for use when two radiators on opposite sides of the main pipe are to be served. The branch flow and return passages *n*, *l*, are cross-connected with the main ducts by zonal passages.

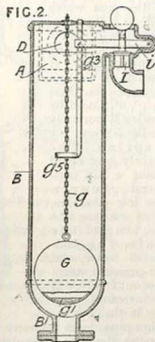
17,339A. Atkinson, R. E. Aug. 1.

Heating buildings.—In the divided single pipe system for heating buildings, for example, as described in Specification No. 17,750, A.D. 1905, the flow and return passages communicate at desired points to allow water of condensation to escape from the flow duct. In the fitting shown in Fig. 4, an aperture *g*, in the dividing web, is controlled by a screw-down valve *k*. Thermostatic means may be employed for controlling the communication.



17,444. Broomell, A. P. Aug. 2.

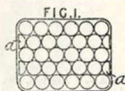
Heating buildings.—Relates to the receivers for steam heating apparatus of the general character illustrated in Specification No. 15,307, A.D. 1900. A float within the receiver controls the damper and opens the escape valve on excessive rise in pressure of the steam. The float *G*, which is weighted at *g*¹, is lifted by the water which is forced by the steam pressure from the boiler through the connexion *B*¹ up into the chamber *B*, and actuates the damper through a chain *g*. Further rise causes it to engage a stop *g*² on an adjustable rod *g*³ which is connected to a lever *i*, and opens the loaded relief valve *I*. If the



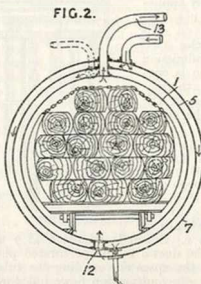
boiler blows off water, this passes over into the receiver *B*. The water of condensation from the radiators passes through a connexion *D* into a chamber *A*, which is provided with a partition serving as a water seal.

17,696. Zimmermann, O. Aug. 7.

Heating water.—Relates to a method of forming stacks of tubes, applicable to water heating apparatus, wherein tube plates are cast around the ends of the tubes, which may be enclosed in a casing. To dispense with a mould and with stoppers &c. for the tubes, such as are described in Specification No. 11,629, A.D. 1905, the stack of tubes is dipped in the molten material and then gently lifted out, so that the material adheres to the outside but not to the inside of the tubes. Where large gaps occur between the tubes, other filling tubes or pieces *a* may be placed in the gaps; or the outer casing may be shaped to the stack to avoid such gaps. Supports may hold the tubes apart; or the ends of the tubes may be bell-mouthed.



17,748. Ohlsson, J. O. Aug. 7, 1905, [date applied for under Patents Act, 1901]. Void. [Published under Patents Act, 1901.]



Heating-apparatus.—In impregnating wood and other substances, the preliminary drying is expedited by means of a current of heated air or other gas. The wood &c. is contained in a cylinder *1*, enclosed by a steam jacket *5*, which in turn is enclosed by a jacket *7*, through which air is forced to the cylinder by the connexion *12*. The air having circulated about the wood escapes by a

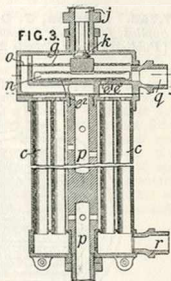
pipe 13, or it may be reconducted to the jacket 7, in which case, the pressure in the system may be greater or less than atmospheric. A condenser may be provided, and the heating of the air may be separate from that of the impregnating-cylinder. The order of the jackets may be reversed and their number increased, and pipe systems may be substituted for them. In the subsequent impregnating, the steam jacket may be used for heating the liquid, and the air jacket then acts as an insulator.

17,813. Breh, K. J., and Kahnert, O.
Aug. 8. *Drawings to Specification.*

Heating air; heating water.—Compressed air, employed to agitate and subsequently to dry the articles treated in a washing-machine, is heated by passage through a pipe in the flue of a steam generator which drives the compressor, the exhaust from which is employed to heat water applied in the process.

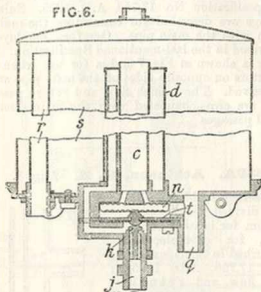
17,840. Jones, C. J., and Still, W. M.
Aug. 8.

Heating water; thermostats.—Apparatus for heating water by steam, particularly applicable for use with lavatories on railway vehicles and ships, the admission of steam is controlled by a thermostat placed in the path of the entering water. In the construction shown in Fig. 3, water enters at *q* and passes through perforations *e* in the partition *e* to the tubes *c*, whence it escapes at *r*. Steam is admitted at *j* and flows through the duct *o* to the perforated pipe *p*, and thence to the space surrounding the tubes, while the water of condensation flows out through the lower portion of the pipe *p*. A thermostat *n* of the capsule type, controlling the steam-inlet valve *k* through the flexible diaphragm *g*, is placed on the partition *e*, which has channels *e'* to permit the water to reach the perforations *e*. In the form illustrated in Fig. 6, a steam chamber *d* located in a water tank *s* is traversed by one or more opened pipes *c* through which the water may circulate. Steam is led in at *j* through the valve *k* controlled by the thermostat *n*, while water enters



at *q* and is drawn off through the pipe *r*. A sheet *t* of non-conducting material prevents the heat of

FIG. 6.



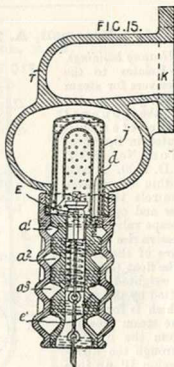
the incoming steam from affecting the operation of the thermostat.

18,002. Hillisch, A. Aug. 10.

Steam traps.—

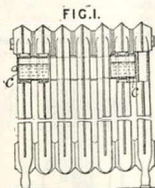
Fig. 15 shows a trap and separator placed at the end of the pipe which collects the condensed water in a system for heating trains by steam. It consists of a number of chambers *a*¹, *a*², *a*³, closed by a valve *E* normally held open by a spring. The slightly conical casing *e* has peripheral grooves. For low pressures, as at starting the heating of the train, the condensed water and low-pressure steam flow out freely, but an increased pressure in the condensation pipe closes the valve and directs the exhaust through the tube *j*, throttle *d*, and grooves round the valve, so that the steam is practically all condensed before exit. This allows a constant circulation of steam through the system, and obviates the use of a closing-cock at the end of the train.

FIG. 15.

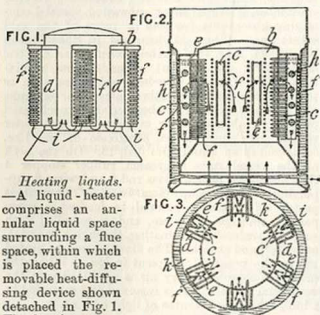


18,077. Burroughes, W. J., and Burroughes, W. J. Aug. 11.
Heating buildings.

—In a radiator, the coils are cut away or recessed to receive a water tray *c*. The tray, which may be placed near the top or the bottom of the radiator, may be of rectangular, circular, oval, or other section.

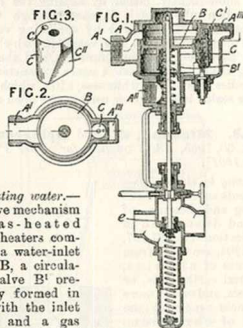

18,214. Goy, W. Aug. 14.

Non-conducting coverings.—Slag wool, either alone or mixed with other insulating-material, is twisted into a rope and enclosed in a seamless tubular covering of asbestos, jute, hemp, silk, &c., the resulting rope being used for insulating purposes.

18,342. Kruel, F. Aug. 17, 1905, [date applied for under Patents Act, 1901].
*Heating liquids.*

—A liquid-heater comprises an annular liquid space surrounding a flue space, within which is placed the removable heat-diffusing device shown detached in Fig. 1. The heating-gases are collected in a hood *b*, whence they pass at right-angles to their original direction by openings *c* into lateral heating-chambers *d* arranged radially around the hood. The heating-chambers are provided with rods *f*, which may be L-shaped and have their yokes in contact with the inner wall of the liquid space. The rods pass through the chambers *d* and project into the hood *b*. The wall of each chamber *d* opposite the opening *c* is formed with a projecting part *e*, preferably formed by bending the wall, as shown. The gases pass downwards over the rods *f* and, after issuing from the bottom of the chambers, pass upwards through the space *k* between adjacent chambers. Part of the gases leave the chambers by openings *h* in the projecting part *e* of the wall and pass into the

spaces *k*, or flow over the yokes of the rods down the space *i*. The inner wall of the liquid space may be conical, so that the heat-diffusing device fits tightly therein by its own weight. The parts of the apparatus may be separable from each other.

18,355. Thompson, W. P., [Humphrey, H. S.] Aug. 15.


Heating water.—A valve mechanism for gas-heated water-heaters comprises a water-inlet valve *B*, a circulating valve *B'* preferably formed in one with the inlet valve, and a gas valve *e* controlled by the water valve.

The water-valve casing is formed with an inlet *A'* connected with the water supply, an outlet *A'''* to the heater, and a circulation inlet *A''* through which the water may normally pass, the circulation valve *B'* being open when no water is being drawn from the heater. The drawing-off of water allows the pressure of the supply to force down the piston valve *B*, which closes the valve *B'* and opens the gas valve *e*. The water valve is constructed so as to give increased delivery as the valve is opened. For this purpose, an adjustable block *C*, having a slant face *C''*, is fitted within a hole in the casing, the water passing between the piston *B* and the slant face. A pin *c* prevents rotation of the block in the casing.

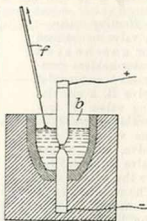
18,485. Allgemeine Electricitäts-Gesellschaft. Aug. 29, 1905, [date applied for under Patents Act, 1901].

Heating by electricity.—Incandescence bodies contain, in addition to a compound or compounds of refractory metals with elements of the silicon and boron groups, substances conductive only when hot, and, in some cases, carbon as well, and are heated, before use, in an inert atmosphere or in a vacuum by an electric current in order to render them uniform. Suitable metals are zirconium, thorium, tantalum, niobium, titanium, and tungsten. The metallic compound, for instance tantalum silicide which may be prepared by fusing silicon with tantalic acid in an electric furnace, is mixed

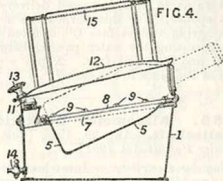
preferably with oxides of rare metals such as yttrium and erbium. Tantalum acid may also be added. Instead of the prepared metallic compound, the elements composing it may be used. The mixture is made plastic with starch, gum tragacanth, or other materials and formed into filaments or rods which are dried and heated in air to remove the binding material before the heating mentioned above. Carbon may be introduced subsequently, either by heating the bodies in a carbon-tube electric furnace through which hydrocarbons are passed, or by admitting volatile carbon compounds into the vessel in which the bodies have been rendered uniform, and then reheating them. The vessel is again exhausted and the bodies heated to whiteness, after which they may be sealed into bulbs or used in the open air.

18,643. Michaud, G., and Delasson, E.
Sept. 30, 1905, [date applied for under Patents Act, 1901].

Heating by electricity.—Filaments or fibres for lighting and heating, of the kind described in Specification No. 27,707, A.D. 1904, are made from a mixture of alumina, infusorial earth, lime, or magnesia, and one or more substances such as the oxides of chromium, thorium, and cerium, with the addition of carbon and optionally of vanadium, osmium, tantalum, or the like, by melting the materials in the carbon crucible of an electric furnace *b* and drawing out threads by means of an aluminium rod *f*.



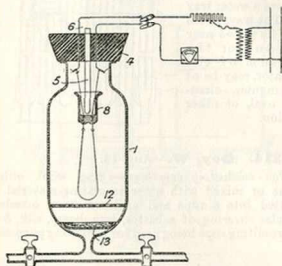
18,700. Belloni, P. Aug. 21.



Heating liquids.—An apparatus for warming wine or other beverage in bottle without disturbing its contents comprises a casing 1, divided by a diaphragm 5, shaped as shown, into two compartments, the lower of which contains the hot water or other heating medium, and in the upper of which the bottle is rested. The diaphragm is clamped at the edges between a ring 8 and a flange 7 by means of screws 9. An aperture with stopper 11 is provided for filling the lower compartment, and a tap 14 for

emptying. A sliding or other cover 12 with knob 13 is fitted, and also a handle 15 for ease of carrying.

18,745. British Thomson-Houston Co.,
[General Electric Co.]. Aug. 21.

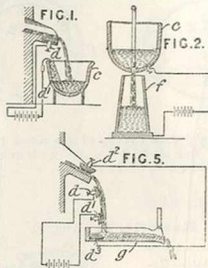


Heating by electricity, incandescent lamps for. A crude filament or the like, containing volatile substances, is heated in an exhausted vessel 1 containing absorbents for one or more of the said substances. When, as described in Specification No. 23,334, A.D. 1906, [Abridgment Class Electric Lamps &c.], the filament is made from a mixture of a refractory powdered substance, such as tungsten, and a warm plastic amalgam, for example, of cadmium, mercury is absorbed by a perforated plate 12 of aluminium or other metal, and water vapour by phosphorous pentoxide or the like, contained in an aluminium dish 13. On the neck of the vessel rests a greased rubber stopper 4 through which pass a glass rod 5 and wires 6 supporting a glass lamp-stem 8. The filament is pasted or otherwise secured to leading-in wires passing through the stem, and is supplied with current, preferably alternating, through a rheostat, ammeter, and switch. The filament may be heated up to the point of incipient fusion. When the process is completed, dry air is admitted into the vessel and the filament is removed and mounted in a bulb for use as a source of light or heat.

18,835. Wynne, F. Aug. 22.

Heating by electricity.—A stream of red-hot molten or semi-molten silicate, glass, metal, or other material is heated, to maintain or increase the fluidity of the material while falling freely from one place to another, by a current of electricity flowing lengthways through the whole cross-section of the stream. Fig. 1 shows one electrode *d* fitted in the spout of a melting-furnace, the other electrode *d'* being arranged in a ladle *c*. The second electrode *d'* may be arranged in contact with a lower portion of the stream. In another arrangement, Fig. 2, one electrode is fitted in a ladle *c* situated above an ingot mould *f*, the base of which forms the other electrode. Fig. 5 shows the

current applied to the stream by means of four electrodes so arranged that the current may pass directly through the stream between the terminals d , d^1 , or indirectly through the stream to the

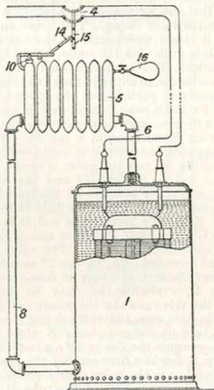


electrode d^2 , thence to the electrode d^3 fitted in a trough g , and through the stream to the electrode d^1 . In another arrangement, the molten material falls from the spout of the furnace into a trough, whence it passes over a disintegrating wheel. One electrode is fitted in the spout and the other electrode is connected to the wheel.

18,876. Darlington, F. Sept. 5, 1905,
[date applied for under Patents Act, 1901].

Apparatus for automatically regulating temperature.—The temperature of electric transformers and

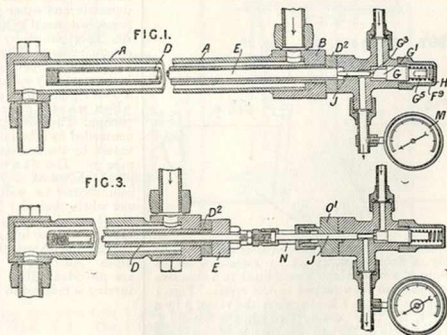
other apparatus in which heat is generated is regulated by the use of a casing 1, containing carbon tetrachloride, the vapour from which passes by a tube 6 to a condenser 5, and returns to the jacket



through a tube 8. Excessive rise in pressure lifts a safety-valve 10, and breaks the circuit by means of a link 14 which actuates a cut-out 4 through toggle-levers 15. To prevent fluctuations of pressure, a gas-bag 16 or the like may be employed.

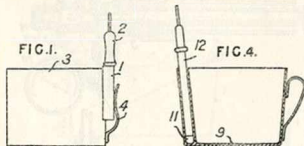
19,106. Clarkson, T. Aug. 27.

Thermostats.—A thermostat, of the kind in which two metals having different coefficients of expansion are employed, is made to actuate the valve controlling the supply of liquid fuel to the burners of a steam generator, through the medium of a removable rod having no appreciable expansion. This rod may be interchanged with others of different lengths so that the temperature at which the thermostat comes into operation may be varied. The thermostat portion comprises a tube D , Fig. 1, fitting in an outer tube A through which circulates steam from the generator, and a rod E , supported loosely in the tube D and



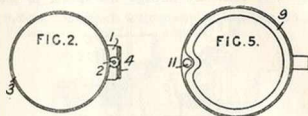
of a different expansibility. The removable rod J is interposed between the end of the rod E and the valve as shown, and is preferably rounded at its ends. A flange D² is formed on or secured to the outer end of the tube D, and is held in place against the face of the steam connexion B by a flange on the valve casing. The inner end of the tube D is closed, and, normally, the outer end of the rod E is flush with the outer face of the flange D², as shown. The valve consists of a cylindrical central portion G, in alinement with the thermostat, and reduced end portions, on the inner one G² of which is formed a conical face, having a cut G³ to serve as a by-pass, and is pressed towards its seat by a spring H enclosed in a cap F³. When the tube D expands, the rods J, E are pressed inwards by the spring H and the valve is closed. To remove the rod J, the cap F³ and the valve are removed, when the pressure of the oil which has escaped past the rod J into the tube G forces out the rods E, J. To replace the rod, it is inserted in a hole G³ formed in the outer end of the valve, which is then used as a tool. The valve is withdrawn and reversed and the cap F³ secured again. To prevent obstruction owing to deposits of oil in the tube D, a stuffing-box may be interposed between the valve and the thermostat, as shown in Fig. 3. In this case, the valve casing is separated from the tube by distance-pieces N which serve as bolts for securing the flange D² against the steam connexion B and also for securing the flange of the stuffing-box to the valve casing. The rod E is secured to the inner end of the tube D, and the rod J is attached to it by means of a screw union, adjustment of which may serve to vary the temperature limits at which the thermostat comes into operation. Or the connexion between the rods E, J may be made at a fixed distance along the former, rods of different lengths being inserted as before. A gauge M may be placed on the fuel outlet pipe to indicate the amount of fuel passing to the burners.

19,207. Junkers, H. Aug. 28.



Thermostats for use with cooking-vessels. The supply of fuel is controlled by variations in the pressure of a fluid which is contained in a sensitive cap adapted to be attached to the vessel. Figs. 1 and 2 show the cap 1 held against the vessel 3 by a spring 4, the tube passing through the handle 2. The inner side of the cap is shaped to fit the vessel

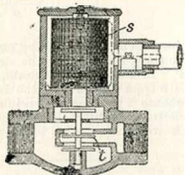
and so form a conducting medium. The outer side is covered with some non-conducting medium.



Figs. 4 and 5 show the cap 12 in a recess 11 in the vessel 9. In a modification, the cap is annular and fits on a projection in the vessel.

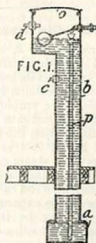
19,387. Kaeferle, F. Aug. 30.

Thermostats.—Relates to the invention described in Specification No. 21,444, A.D. 1905, and consists in employing a double-beat valve *t* with the temperature-controlled electro-magnet S.



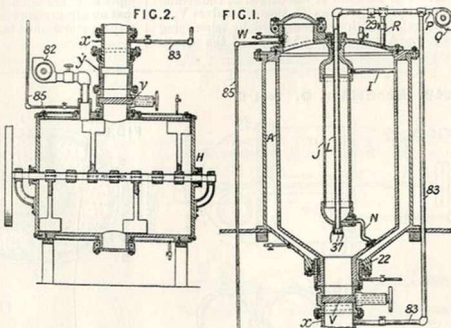
19,512. Preston, J. R. Sept. 1.

Heating water.—In apparatus for the supply, in cottages or small houses, of hot water for domestic and other purposes, the usual cylinder &c. is replaced by the simple column of water *b*, which may open into a boiler *a* or may surround a stove pipe through which waste gases are passing. The cold supply, controlled by a ball cock, enters by the descending pipe *p*. The draw-off pipe is shown at *c*. The column may be widened out where desired. The pipe *b* may be circular or rectangular, and may be inclined so as to bring the upper part into or next the bathroom and thereby shorten the draw-off pipes. An overflow pipe *d* and a loose cover *o* are provided. Risk of explosion by freezing or furring is reduced to a minimum.



19,727. Haddan, H. J., [Edson Reduction Machinery Co.]. Sept. 4.

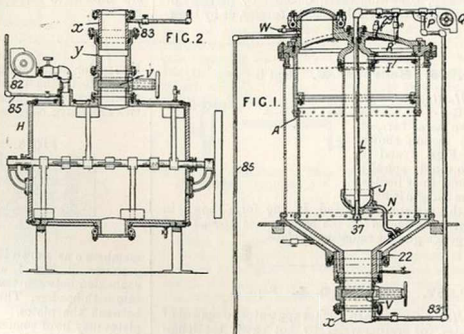
Digesters.—Garbage or sewage is disintegrated by digesting and drying it in the chambers A, H. To prevent the separation of ammonia and glycerine vapours, the material under treatment in the digester is submitted to an air pressure at least ten pounds per square inch in excess of the steam pressure in the jacket, the air pressure being obtained by means of a pump Q connected to the digester by pipes P, R. The material can be agitated by air admitted by the pipe L and orifices 37. A drum J, surrounding the pipe L, is connected to the steam-jacket by pipes N, I. The digester is provided with an air-escape valve 29 and a water-supply pipe W. Steam under a pressure of about sixty pounds to the square inch and at a temperature of about 300° F. is admitted to the jacket surrounding the receptacle A, which is free to elongate downwards through the stuffing-box 22. The material is discharged to the steam-jacketted drying-chamber H through valves V, v, the casings



of which are connected by telescoping pipes *x, y*. A valved pipe 85 allows of the equalization of pressure in the digesting and drying chambers during the charging of the latter. The pipes *x, P* are connected by a valved pipe 83, so that an air pressure equal to that in the digester may be maintained below the valve V.

19,728. Haddan, H. J., [Edson Reduction Machinery Co.]. Sept. 4.

Digesters.—Garbage or sewage is disintegrated by digesting and drying it in the chambers A, H. To prevent the separation of ammonia and glycerine vapours, the material under treatment in the digester, which is of the class described in Specifications Nos. 18,742 and 18,743, A.D. 1902, and No. 7519, A.D. 1903, is submitted to an air pressure at least ten pounds per square inch in excess of the steam pressure in the jacket, the air pressure being obtained by means of a pump Q, connected to the digester by pipes P, R. The material can be agitated by air admitted by the pipe L and orifices 37. A drum J surrounding the pipe L is connected to the steam-jacket by pipes N, I. The digester is provided with an air-escape valve 29

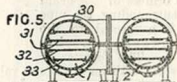
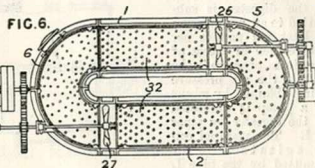
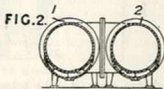
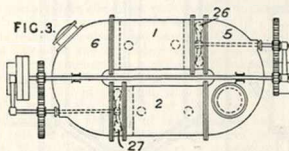


and a water-supply pipe W. Steam under a pressure of about sixty pounds to the square inch and at a temperature of about 300° F. is admitted

to the jacket surrounding the receptacle A, which is free to elongate downwards through the stuffing-box 22. The material is discharged to the steam-jacketed drying-chambers H through valves V, e, the casings of which are connected by telescoping pipes *x, y*. A valved pipe 85 allows of the equal-

ization of pressure in the digesting and drying chambers during the charging of the latter. The pipes *x, P* are connected by a valved pipe 83, so that an air pressure equal to that in the digester may be maintained below the valve V.

19,848. Schneider, O. Sept. 6.

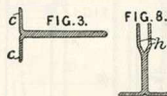


Digesters.—Relates to the extraction of glue or gelatine and consists in imparting to the raw materials a circular course determined by an endless pipe or the like and at the same time a rotary and progressive motion, that is a helical motion, during which the particles perform whirling or eddying movements, whereby the materials are caused to pass along close to a heated surface. The cylindrical vessels 1, 2, Figs. 2 and 3, are connected by the semicircular pieces 5, 6, heating being effected by partially or completely steam-jacketing the former, or by blow-

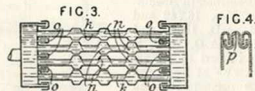
ing steam into the liquid. The screw-propellers 26, 27, driven by suitable gearing, agitate the liquid, all the particles of the materials being brought into contact with the heated walls of the chamber. The apparatus may be used for the washing of the materials, provided it is lined with some acid-resisting material such as wood, aluminium, lead, or acid-proof stone. In a modification, shown in Figs. 5 and 6, removable perforated trays 30, 33, on which the materials are allowed to settle, are detachably supported on brackets.

19,866. Schroer, W. Sept. 6.

Heating buildings.
—Radiators have metal bars, of the section shown in Figs. 3 and 8, wound spirally round their bodies. The flange *c* is fixed to the radiator body and, in the form shown in Fig. 8, the end *h* of the split web is opened out to give a greater radiating-surface.



having longitudinal and transverse protuberances which form the channels *k, n*. The plates are connected by lap joints, the overlapping parts of two successive cells being connected by U-shaped



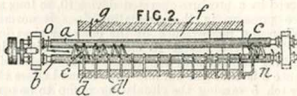
members *o* as shown in Fig. 3, or by the members *p* shown in Fig. 4, so as to provide an elastic connexion between the cells. The cells communicate with headers. The hot gases pass transversely between the plates. The protuberances on the plates may be of semicircular or other cross-section. [Reference has been directed under Patents Act, 1902, to Specification No. 29,425, A.D. 1904, [Abridgment Class Cooling &c.].]

19,957. Schmitt, C. L. Sept. 7.

Heating water.—In surface apparatus composed of plates, for heating water by hot gases, the longitudinal passages *k* of each cell are connected by transverse passages *n* at regular intervals. Each cell is formed by the juxtaposition of two plates

- 20,128. **Giriot, J.** Nov. 4, 1905 [date applied for under Patents Act, 1901].

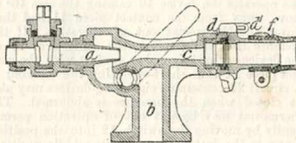
Heating apparatus.—Helical bodies, such as helical springs, are heated while subjected to rotary motion in conjunction with a forward movement from the cooler to the hotter part of the furnace. The helical bodies *c* are supported on parallel rollers *a, b* extending through the furnace *f*. The rollers *a, b*, may be hollow with cold water circulating through them and may be jacketed with fire-proof material, and both rollers are rotated in the same direction, thereby imparting rotary motion to the helices. Fixed arms *d, d'*, or rings fixed round one or both rollers, engage the convolutions of the rotating helix and cause it to move



along the rollers *a, b* from the end *n* through the furnace towards the part *g* where the flame enters, and out at the end *o*.

- 20,386. **Gresham, H. E.** Sept. 13.

Heating water.—For washing out locomotive and like boilers by hot water, a steam and water mixer is placed in the position usually occupied by the ordinary cold-water connexions in engine sheds and similar places. The mixer comprises the steam nozzle *a* which delivers to the mixing-chamber *c* to which cold water is admitted by the pipe *b*, the respective supplies of water and steam being regulated by suitable cocks. The hot water is delivered through hose-piping.



- 20,601. **Lancaster, E. W.** Sept. 17.

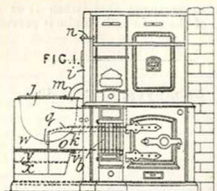
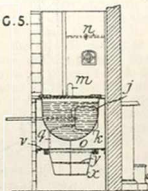


FIG. 5.



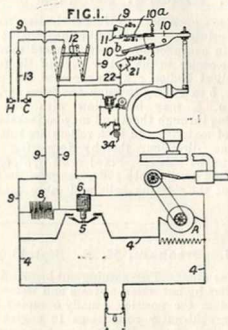
Boiling-pans.—In combination apparatus of the kind wherein a range fire is adapted to heat an adjacent boiler or "copper" for heating water for

baths, laundry, and general use, the boiler *j*, which may be automatically fed, has a lateral extension *k* projecting into the space behind the range grate *b*. An independent fire-place *x* may be fitted under the boiler. This fire-place consists of a casing containing a grate *y* and is slipped into channel-irons on the underside of the plate *v*. When the boiler *j* is to be heated by the range fire, the opening in the plate *v* is closed by a removable plate *w*, and the combustion products pass along the flue *o* round the boiler, and above the partition *q* to the flue *i*, which is fitted with a rotary damper. A pipe *m* conducts steam from the boiler to the flue *i*.

- 20,609. **Mills, C. K.**, [Automatic Refrigerating Co.]. Sept. 17.

Thermostats.—Relates to apparatus for controlling automatically the flow of fluid in refrigerating-systems and the like, in which the flow is controlled both according to the temperature of a chamber through which the fluid passes and according to the pressure in the circulating system. In the arrangement shown, the circulating-pump is driven by an electro-motor *A*, controlled by a switch *5* connected to the armature of a solenoid *6*, which is in shunt to the mains *4*. A resistance *8* in the circuit containing the solenoid *6* is such that when the resistance *8* and the solenoid *6* are in series the solenoid is not sufficiently energized

to operate the switch 5. A branch circuit 9, which is opened or closed by a thermostat 13, is also closed by a pressure-operated device 10, so long as the pressure in the circulating-pipes is normal. When the temperature of the chamber rises too high, the thermostat 13 closes the circuit 9 by making contact with the terminal H. The resistance 8 is thus cut out and the solenoid closes the switch 5 causing the circulating pump to be operated. When the temperature falls within the limits, the thermostat 13 leaves the terminal H, but the motor continues to work as the current passing through the resistance 8 and the solenoid 6 is sufficient to hold the switch 5 closed. If the temperature falls too low, the thermostat 13 comes in contact with the terminal C and thus short circuits the solenoid 6, causing the motor A to stop. If the pressure in the circulating-pipes rises above a limit, the pressure tube or the like operates the device 10 causing the arm 10^a to move away from the contact piece 11 and thus throw the thermostat out of operation. If the pressure rises still further, the other arm 10^b of the device ultimately makes contact with the contact piece 21 thus short-circuiting the solenoid 6. A circuit 22 containing signalling-devices may also be closed when the pressure is abnormal. The thermostat may be put out of operation permanently by moving the switch 12 into the position shown in the dotted lines. In its middle position,

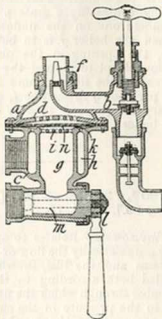


the switch 12 cuts out both controlling devices, except that if the pressure rises too high the arm 10^b of the device 10 comes in contact with the contact piece 21, and the motor stops.

20,734. **Kruel, F.** Sept. 29, 1905, [date applied for under Patents Act, 1901].

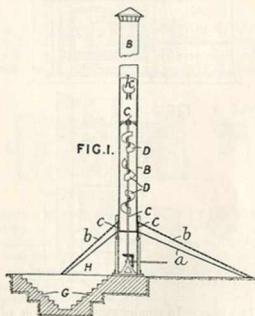
Heating liquids.

—Water flows to a gas heater through a valve *b* of ordinary construction and a nozzle *f* situated in a chamber *a* provided with a perforated plate *d*. The gas is supplied to the inner chamber *g* of the regulator by way of the main gas cock *l*, and the outer chamber *h* communicates with the burner. When the valve *b* is closed, the pressure of water in the heater forces the membrane *n* upon the annular projection *k* and thus cuts off the gas supply. On opening the valve *b*, the suction produced by the flow of water through the nozzle *f* causes the membrane to lift, and the gas then passes to the burner by way of the perforated plate *i*. A cock *m* controls a pilot light and its



handle is so arranged that, when it is closed, movement of the main-cock handle is prevented.

20,794. **Cabanyes, I.** Sept. 19.



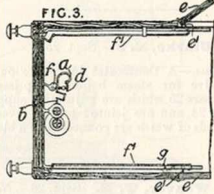
Solar heat, utilizing.—Screw vanes D are mounted

on a vertical spindle C in a shaft B, and are rotated by a current of hot air which is caused to pass up the shaft from the chamber *a, b*. The air between the conical surfaces *a, b* is heated by the sun's rays and passing through the gates *c* enters the shaft B. The space between the surfaces *a, b* is divided into compartments each of which is provided with a separate gate *c* so that only those compartments receiving the sun's rays directly may be open. The

surface of the shaft B and the surfaces *a, b* are blackened, and the surface *b* is perforated. A regulator *k*, comprising two flap valves, is placed in the chimney. These may be regulated by hand, or may serve as an automatic check to sudden currents or gusts of air. Entrance to the interior H may be by a door or by the steps G. When desired, the motor may be driven by placing stoves, furnaces, &c. below the wall *b*.

20,923. Berget, T. C. X. A. Oct. 16, 1905, [date applied for under Patents Act, 1901].

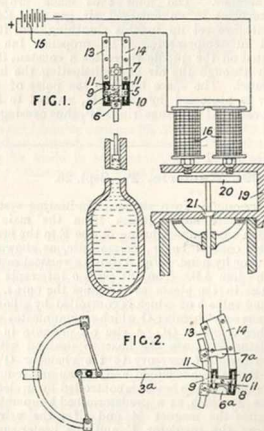
Thermostats.—In apparatus for lowering and maintaining constant the temperature in wagons employed for the transport and preservation of vegetable and animal products, the expansion of a compressed or liquefied gas is controlled by a thermostat. A spiral tube *a*, filled with a volatile liquid, directly acts upon and controls the expansion valve *b* of the gas reservoir, so as to open the valve as soon as the temperature exceeds one limit and to close the valve as soon as the temperature has reached the required value. To avoid waste of gas when the wagon doors *e* are opened, the thermostat is connected to the doors, so that it is confined and the expansion valve closed when the doors are opened. In one arrangement, an arm *e'* on the door actuates, through a rod *f'* and levers, a catch *f* which presses the thermostat against a stop *d* so as to prevent it from opening the valve. In another arrangement, the top of a rolling door actuates a bell-crank lever connected to the rod *f'*. After



passing through the expansion valve, carbonic acid or other gas flows through cooling-tubes *g*. The vehicle may also be cooled by ice &c.

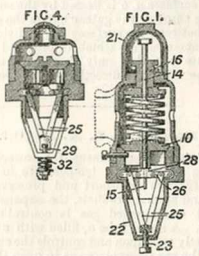
20,924. Berget, T. C. X. A. Feb. 6, [date applied for under Patents Act, 1901].

Thermostats &c.—In apparatus, such as that described in Specification No. 20,923, A.D. 1906, for controlling the expansion of a gas for regulating the temperature inside a refrigerating-vehicle, direct connexion between the deformable portion of the thermostat and the expansion valve is avoided by introducing intermediate electric actuating-means. The expansion valve 21 is operated through an electro-magnet 16 situated outside the gas reservoir casing 19, the armature 20 of the magnet being actuated entirely within the casing so that no moving part passes through it. To complete or interrupt the electric circuit at predetermined temperatures, either of the thermostatic arrangements shown in Figs. 1 and 2 may be employed. As shown in Fig. 1, a mercury thermometer has a float attached to a rod, which passes freely through a ring 5 and is provided with adjustable stops 6, 7. The ring 5 carries an insulating cross-piece 8 having contacts 9, 10, which may rest upon the insulated portion 11 of the slide. Insulated metal strips 13, 14 are connected to a source of electricity 15 and the electro-magnet in the manner shown. In another arrangement, Fig. 2, a deformable tube filled with a volatile liquid actuates a lever 3^a carrying adjustable stops 6^a, 7^a. These stops are arranged to move the cross-piece 8 carrying contacts 9, 10 over the insulated



portions 10 or the metal strips 13, 14, as before. In operation, the apparatus does not actuate the expansion valve immediately a change of temperature occurs in the vehicle, but only after an interval has elapsed, and when the temperature reaches the predetermined limits. In another arrangement, the thermostat may control a motor, driven electrically or by compressed gas, which actuates the expansion valve. The supply of electricity may be taken from the electric generator of the train. A switch actuated by the doors of the vehicle may put the thermostat out of action when the doors are opened.

engaging the stem 15 of the valve. Fig. 4 shows another arrangement in which one of the bars 25



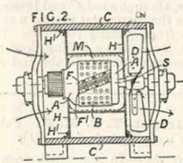
21,213. Clarke, E. J. Sept. 25.

Thermostats.—A thermostat in connexion with a safety-valve for steam boilers comprises two expansion bars 25 which are adjustably supported by a screw 23, and are jointed to two levers 26, the inner ends of which are connected to a block 28

is hinged to the other bar, and the thermostat is held down by a spring 32.

21,279. Weaver, T. E. Sept. 26. *No Patent granted (Sealing fee not paid).*

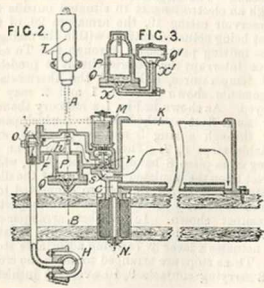
Heating by electricity.—An electromotor is used to heat air and also to drive a fan for distributing it to heat buildings or for ventilation purposes. Around the armature A of a direct-current motor, a perforated brass sheet B is placed, joined by diagonal flanges F, F', riveted both to the edges of the sheet B and to one another. The joint thus made projects and revolves in an enlarged air gap M. Eddy currents are set up in this sheathing, and it is raised in temperature. The propeller fan D mounted on the spindle S creates a constant flow of air through the air gap, dissipating the heat generated. The space between the poles of the motor is protected by plates H, riveted to the outer casing C by flange rings H', thus causing all



air to pass through the central aperture M. In a modification, two similar motors are shown driving a centrifugal fan, the air being heated by the armature sheaths as described above.

21,309. Kaeferle, F. Sept. 26.

Thermostats.—In a steam train-heating system, high-pressure steam passes from the main H through a pressure-reducing device F to the heater K, the control being thermostatic, as shown in Fig. 2, or by hand. Fig. 3 shows a vertical section on the line AB. The slit plug *o* intercepts impurities in the steam as it enters the port *i*, the pivoted valve *h* of which is controlled by a float P in a mercury chamber Q which communicates with another chamber Q'. A rise of pressure in the regulator F causes the float to descend with a transference of mercury to the chamber Q', so that the valve *h* is closed and the supply reduced. The supply to the heater is controlled by an electric device T, which, at a predetermined temperature, energizes the magnet M and lifts the valve *v* between the regulator F and the heater-supply



pipe *s*. Ball valves *x*, *x'* close the passage between the chambers *Q*, *Q'* when the mercury sinks below the seat of either valve.

21,447. Shaler, C. A. Sept. 27.

Heating by electricity.—Relates to vulcanizers employed in repairing tyres, and comprises a hollow casing provided with clamping-screws for clamping it to the tyre that casing being filled with an electrically insulating heat-conducting material and having heating-coils embedded therein and operatively connected with a rheostat and source of electrical energy. The rectangular casing 5 has a flat base 6 and curved upper surface 7; extending laterally are lugs having slots 10 for the reception of holding-bolts 11. Within the heater is a metal core 23 covered with mica 24 and embedded in suitable conducting material. Connected with terminals is a coil 26 which embraces the core 23; the terminals are connected with a rheostat and an electrical circuit. A thermometer is attached to the casing. Inner tyres are repaired by being placed on the

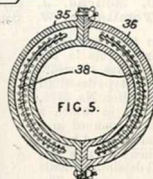
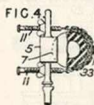
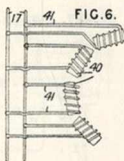
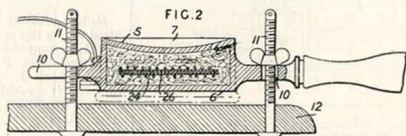
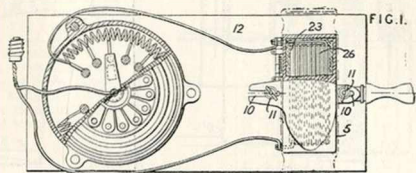


table 12 and having the heater clamped down on the injured portion, as shown in Fig. 2. Outer covers are repaired by attaching the heater by chains 33 or a similar flexible medium to the tyre while it is on the wheel, as shown in Fig. 4. Fig. 5

shows a form in which the vulcanizer is made in two semicircular sections 35, 36, the cores 38 being similarly curved. If the casing is large, the cores may be made in sections 40, Fig. 6, the coils 41 being connected with wires 17.

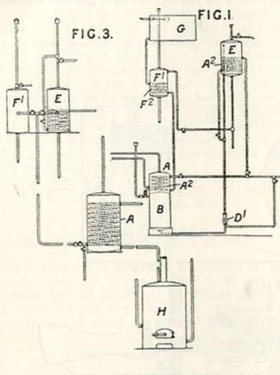
21,473. Taylor, E. T. Sept. 28.

Heating water.—In a combined system of heating water for circulation and of obtaining purified water, for use in hospitals and other institutions, wherein the latent heat from the steam condensed to provide the pure water is utilized to heat the circulation water, the latter is heated in the compartment A, Fig. 1, of a divided tank by means of the steam coil A². The water of condensation collects in the compartment B, whence it is raised by a jet pump D¹ to an elevated supply cistern E, in which is placed another coil A² to maintain its temperature. In order that cold sterilized water may be available, a tank F¹ is provided containing

a coil F², fed from the cold-water tank G and leading to the compartment A. In a modified arrangement, the reservoir B is dispensed with. In the arrangement illustrated in Fig. 3 the invention is applied to the ordinary hot-water circulating system. The boiler H is employed as a storage tank, from which the water passes to the heater A, whence it flows through a pipe as shown, whilst the water of condensation passes to the hot and cold tanks E, F¹. An arrangement is also described in which the boiler H may be heated in the ordinary way in cases where the steam supply fails. Valves, vents, and overflow pipes are provided where desirable.

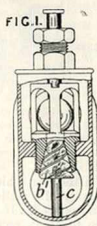
(For Figures see next page.)

21,473.



21,560. Bourne, J. C., Rees, G. H., and Tomlinson, W. Sept. 29.

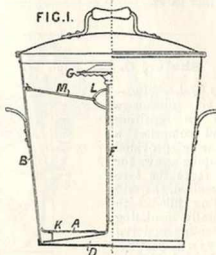
Steam traps.—Relates to improvements in the ball lift-valves of steam traps of the type described in Specification No. 3175, A.D. 1906, in which a free ball is confined in a cage and is lifted by the fluid when the valve seat and ball-detaining spindle are moved apart. The improvement consists in providing, in the conical approach to the valve, a core *c* having one, two, or three spiral vanes *b* which impart a rotary motion to the fluid to ensure that the ball shall revolve a little whenever it is lifted.



21,638. Kiell, J., and Stow, A. A. Oct. 1. Drawings to Specification.

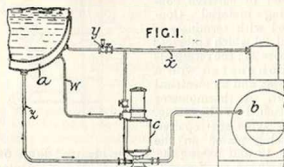
Thermostats.—In electrically heated incubators, a regulating device consists of a switch operated by a thermostat. Two metal uprights are mounted on an insulating base, and to one is attached a leaf spring which is pressed into contact with the other upright by the balance lever of the thermostat.

21,792. Thouaille, H. R. Oct. 3.

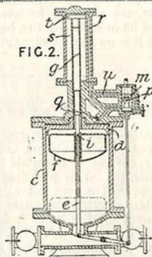


Boiling-pans.—A domestic washing-boiler B is fitted with a liquid-circulating device comprising a disk A, supported by a conical dish D and carrying a vertical tube F terminating in a corrugated flange and cap G. The disk A, or the base of the tube F, is provided with perforations K. To prevent the clothes from rising unduly, a ring L is arranged, as shown, and is supported by arms M.

22,287. Weckerle, W. Oct. 9.

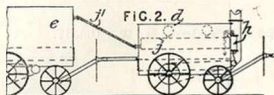


Heating by steam circulation; steam traps.—The water of condensation from the steam jackets of cooking-apparatus &c. is automatically forced back to the boiler by live steam, which is subsequently employed, when exhausted from the forcing-apparatus, in the steam jackets. The steam passes from the boiler *b* to the jacket *a* through a pipe *x* and



reducing-valve *y*, the water of condensation flowing through a pipe *z* to a device *c*. The latter, shown in section in Fig. 2, comprises two cylinders *e*, *s* containing pistons *d*, *t* connected by a rod *g*, in which works a slotted tube *e* linked to a piston valve *m*. When the water of condensation raises the float *f* sufficiently, a projection *i* on the latter engages with the slot in the tube *e*, and causes the movement of the valve *m* so as to admit live steam above both the pistons *d*, *t* through a pipe *p* and passages *q*, *r*, thus forcing the water back to the boiler. The piston valve *m* is returned to its original position by the descent of piston *t* forcing down the tube *e*, steam then having access through a passage *u* to the lower side of the piston *t*, which together with the piston *d* is raised again. Steam exhausted by the movements of the pistons passes to the jacket *a* through a pipe *w*.

22,434. Thwaite, B. H. Oct. 11.



Heating liquids; boiling-pans.—Consists in improvements in connexion with the tar heating and spreading machine described in Specification No. 13,551, A.D. 1906. An auxiliary heating-vessel *d* is employed, and has a pump *h* for supplying additional air pressure to the original machine *e*, the tar feed-tank of which may be connected to the heater *d* by flexible metallic tubing through which tar is supplied by the pump or by gravity.

22,570. Hallas, J. Oct. 12.

Steam traps.—Relates to apparatus for returning water of condensation to the boiler, of the type comprising a main and a supplementary chamber each containing a float, that in the latter operating the steam inlet and exhaust valves through a shaft, and consists in modifications in the arrangement of the shaft, in adjustably connecting the valve-operating levers thereto, and in the roller-cradle for obtaining complete and rapid reversals. The main chamber *a* contains a float *a'* which, on rising, shuts a valve *a''* at the base of the secondary chamber *b*, the float *b'* in which is adjustably connected to a shaft *e* extending completely through the trap. The steam inlet and exhaust valves *c*, *d* are operated from this shaft through adjustable levers and links, e.g. in the case of the valve *c*, through the rat-trap fastening *f*, lever *g*, link *g'*, and pivoted arm *h*. At one end of the shaft *e* is secured the counterbalancing arm *i* and the cradle *j*, bent upwards at *j''* and containing the rolling weight *j'*. In operation, the float *a'* is first raised by the inflow of water, thus closing valve *a''*; when the main chamber is full, the water overflows

into the compartment *b*, siphon pipes *r* assisting, until the rise of the float *b'* operates the shaft and valves to cut off the exhaust and admit steam to discharge the water from the main chamber. When

FIG. 1.

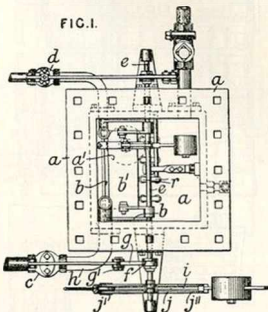
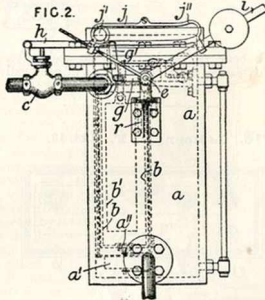


FIG. 2.

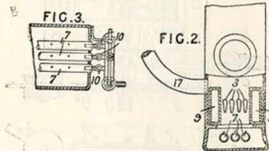
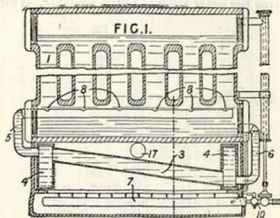


the latter is empty, the float *a'* allows the water in the chamber *b* to be discharged also, whereupon the float *b'* falls, and the shaft *e* rotates and reverses the valves.

22,603. Pieper, W. Oct. 12. *No Patent granted (Sealing fee not paid).*

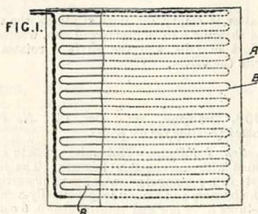
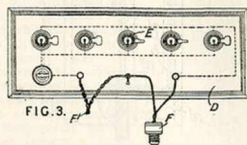
Heating buildings.—Hot-water radiators are provided with gas heaters beneath. The heater consists in a rectangular water space 49 surrounding the burners and having longitudinally-arranged cross-tubes 3. Flow and return tubes 5, 6 connect it with the radiator. The flow tube 5 is continued along the lower ends of the radiator tubes 1 and has an aperture 8 opposite each one, so that the

radiator is equally heated. A thermostatic device controls the admission of gas to the burner tubes 7,



and a cock 10 is also fitted to each tube. A tube 17 carries away the products of combustion.

22,716. Laffoon, R. F. Oct. 13.



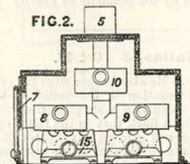
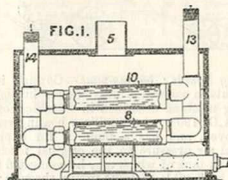
Heating by electricity.—Relates to electric blankets provided with means for varying the

strength of the heating-current. A resistance wire B, preferably insulated, is arranged in a tortuous way within a fabric A, and a variable resistance is connected in series with it. This resistance consists of a number of electric lamps E mounted on a board D and wired in parallel with switches, so that any number of the lamps may be in use at a given time. The leads F, F are connected to the fabric and the source of current, respectively.

22,808. Leitner, H. Oct. 15.

Heating by electricity.—An electric heater comprises bodies of carbon, metal, &c. arranged in vessels exhausted of air but containing rarefied hydrogen, which does not attain to atmospheric pressure even when hot.

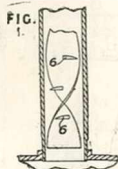
22,991. Fenlon, H. T. Oct. 17.



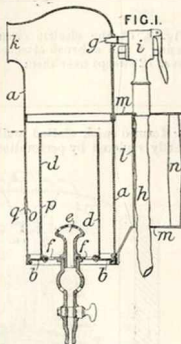
Heating water.—Relates to a gas-heated water-heater which may be used in conjunction with a kitchen-range boiler, or independently, for supplying hot water for domestic and other purposes. A lagged casing, having a door 7 and an exit 5, for the products of combustion, contains three boilers 8, 9, 10, each of which is separately connected to flow and return pipes 13, 14. Two of the boilers 8, 9 are arranged side by side above burners 15. The third boiler 10 is arranged above the space between the other two boilers. The boilers may taper slightly longitudinally.

23,129. Green, F. W. Oct. 18.

Heating air.—In an air-heater in which the air to be heated passes through pipes heated externally, each pipe is fitted with a baffle consisting of a spiral strip having wings or vanes *b*, which divide and deflect the spiral stream of air to the inner surface of the pipe.

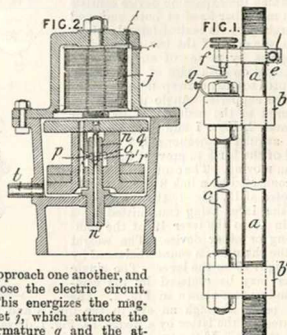

23,243. Hovenden & Sons, R., and Colledge, E. Oct. 19.

Heating air.—Apparatus for heating air, which is chiefly used for drying the hair after shampooing, comprises an atmospheric burner *e* surrounded by inner and outer casings *d*, *a* having an outlet *k* near the top, and a nozzle *g* supplying air from a compressed-air reservoir. The base of the inner casing *d* is perforated at *f* to admit air, and is connected to the outer casing by brackets *b*. The admission of compressed air may be regulated by a valve *i*, and the air-supply tube *h* may be supported in the arms *m* of a handle *l* attached to the outer casing. A second handle *n* may be provided, and openings *p*, *o*, the latter of which is fitted with a door *g*, are made in the casings for giving access to the burner for lighting.


23,277. Stockport Engineering Co., and Lomax, R. Oct. 20.

Steam traps.—Upon the copper or other suitable metal pipe *a* leading from the steam radiator to the valve at *n* are mounted blocks *e*, *b'*, the former carrying a contact-screw *f*, and the latter a rod *c* parallel to the tube the upper end of which carries a block *b* slidable on the tube *a*. Upon this block is an insulated spring contact-piece *g*. These contacts are in an electric circuit which also comprises the magnet *j* and a battery. Any contraction in

the pipe *a* due to the presence of water of condensation causes the block *e* and the cross-head *b* to

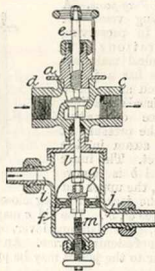


approach one another, and close the electric circuit. This energizes the magnet *j*, which attracts the armature *g* and the attached block *r*, so that the steam pressure raises the valve *o* and blows the water out through the passages *p*, *r*, *t*.

23,820. Westwood, J. W. Oct. 26.

Heating buildings.

An automatic differential-pressure valve apparatus, for controlling the supply of heating medium to radiators and the like, consists in an inlet valve *a* rigidly connected by means of a rod *l* to a piston *f*, carrying the outlet valve *g* and its seat. The steam &c. inlet is at *c* and the flow and return to the radiator are at *d* and *i*, respectively, the passage *j* being connected with the discharge pipe. When the valve *a* is on its seat, as is the case normally owing to the weight of the valves, the outlet valve *g* is lifted from its seat by the adjustable stop *m*. The pressure of steam entering at *c* lifts the valve *a* and hence the piston *f*, so that the valve *g* comes into contact with its seat and closes the outlet. The area of the piston is greater than the area of the valve *a*, so that when the pressure becomes equalized in the radiator, the piston is forced down, thus again closing the inlet *a* and opening the outlet *g*. The operations are then repeated. The amount of lift of the inlet can be regulated by means of a screw *e*.



23,890. Huysmans, G., and Hankin, M. Oct. 26.

Thermostats.—In thermostats &c., in which the expansion device consists of a metal bar fixed at both ends and operating by its central lateral deflection, the ends of the bar are held in supports by means of angular parts arranged on both sides of the bar and adapted to enter corresponding recesses in the supports. Angle pieces 3 are secured to the casing 1 at its lower corners 2, Figs. 1 and 2, and engage the angular projections 6, 7 on each end of the bar 5 to prevent these ends from moving. The centre of the bar 5 is connected by a link 8 to a lever 12 pivoted at 13, Fig. 1, the movements of this lever being transmitted by a chain 17 to the lever 19 of the indicating or other device. The weight of the chain &c. is counterbalanced by a weight 15 on the lever. The single lever may be replaced by the compound system shown in Fig. 2. The bar passes through an eye in the link 8 and is secured to the latter by a wedge 10, Fig. 1, driven into the eye. If the expansion device is to control apparatus at a distance electrically, the contacts 31,

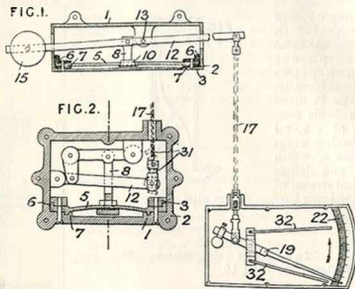
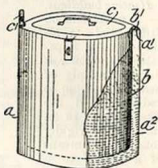


Fig. 2, of the electric circuits project into the casing 1 and a brush attached to the end of the lever 12 sweeps over them.

23,988. Geissler, R. Oct. 27.

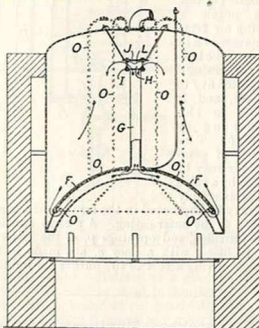
Boiling-pans.—A heating-vessel for use in preserving operations or in chemical manufactures has a jacket a^2 and an acoustic or visual signalling-device operated by the pressure of the steam in the jacket. The inner vessel b is removable, the upper end of the jacket a^2 being closed by the overlapping flanges a^1, b^1 . The lid c may be secured by spring clips, by a clamping-lever, or by a screw, hasp, or other fastening-device. An aperture for feeding water to the jacket may be provided.



24,003. Dent, R. A. Oct. 29.

Boiling-pans.—Coppers and like fire-heated apparatus are provided with circulating apparatus comprising a false bottom F, a pipe or pipes G, and a number of pipes O directing steam jets under the exterior of the false bottom F. The pipes G communicate at their upper ends with one or more chambers H such as that formed between the flange I and the disk J, whereby the upflowing liquid and gases are directed towards the walls of the vessel, this action being aided by means of conical projections L. The chambers H may also

be formed with slotted walls, or be wholly or partly replaced by perforations in the upper parts



of the pipes G. According to the Provisional Specification, the invention may be applied to brewers' coppers.

24,085. Höhnke, L. Oct. 29. *Drawings to Specification.*

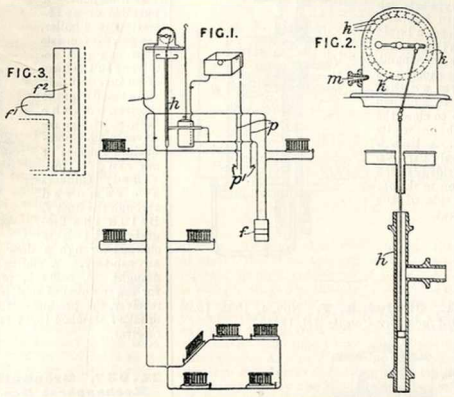
Non-conducting coverings and compositions.—A

mixture of baked ground earth and crushed cork or other vegetable matter is used as a non-conducting

packing or lining in a special construction of field cooking-apparatus.

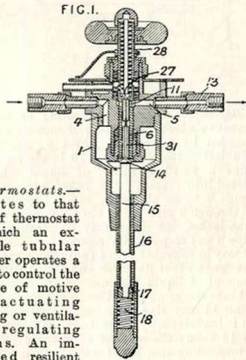
24,132. McKibbin, A. Oct. 30. *No Patent granted (Sealing fee not paid).*

Heating buildings.—In systems of heating buildings and of supplying water for domestic purposes, in which the boiler is placed above the lowest point of the system, a forced circulation of the water is obtained by a pump *h*, Figs. 1 and 2, actuated by a wheel *k*, which is driven by a jet of water issuing from a nozzle *m*. The boiler *f*, Fig. 1, is preferably formed with a vertical flue *f*², Fig. 3, and with an extension *f*¹ which projects over the fire. The pipes for supplying water for domestic purposes are shown at *p*, and the taps at *p*¹.



24,183. Weld, G. A. Oct. 30.

FIG. I.

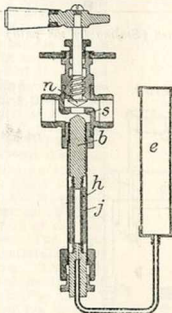


Thermostats.—Relates to that type of thermostat in which an expansible tubular member operates a valve to control the passage of motive fluid actuating heating or ventilation regulating means. An improved resilient connexion between the expansible member and the valve spindle is

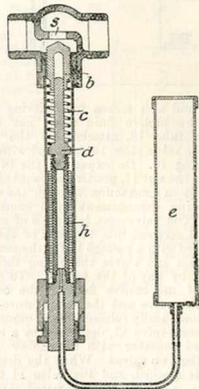
provided, and also means for relieving the pressure of the motive fluid when cut off. The expansible tube 16, attached to the casing 1, encloses the valve stem 15 provided with a nut 17 and a spring 18. On expansion, the tube 16, by bearing on the nut 17, positively opens the valve 14, but closes it on contraction through the spring 18, so preventing derangement upon excessive contraction. The valve seat is formed of an adjustable tube 6, screwed into the head of the casing 1 and provided with a passage 11 for the motive fluid, which enters and leaves the casing through the ducts 4, 5 by way of the tube 6. To allow the pressure of the motive fluid in the connexions between the valve and the temperature-regulator to be automatically released upon closure of the valve, a vent valve 27, depressed by a spring 28, is provided together with a member 31 placed between the two valves. When the desired temperature is reached, and the valve 14 closes, the vent valve is simultaneously raised through the member 31, so as to release the compressed fluid in the pipe 13 and its connexions. The above result may also be effected by providing a permanently open small vent in the connecting-pipe.

24,213. Clorius, A. V. Nov. 7, 1905, [date applied for under Patents Act, 1901].

Thermostats.—In valve apparatus of the type in which a rise in temperature causes a liquid contained in a vessel *e* to expand, thereby causing an armoured rubber tube *h* to lengthen and so to close the valve *b* on to its seat *s*, a hand-operated valve *n* is provided which closes on to the opposite side of the same seat.



24,241. Clorius, A. V. Nov. 4, 1905, [date applied for under Patents Act, 1901].

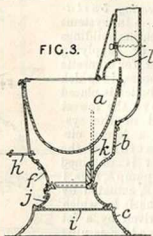


Thermostats.—In apparatus of the type in which a rise in temperature causes a liquid contained in a closed vessel *e* to expand, thereby causing an armoured rubber tube *h* to lengthen and so close the valve *b* on to the seat *s*, a spring *c* is provided between the valve and the movable member *d* to prevent damage if the valve is over-actuated.

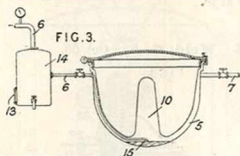
Instead of the spring, a small air space may be left in the vessel *e*.

24,607. Lancaster, E. W. Nov. 3.

Boiling-pans.—A portable or self-setting wash boiler, set-pot, &c. consists of a pan *a*, a receiver *b* in the form of an inverted bell, and a stand *c* for the receiver. At the bottom of the receiver, a slow-combustion furnace or gas ring is provided. Clinkers are removed through the door *f*. Below the fire-grate, which is charged through a door *h*, is a plate *i* forming an ash-tray. A sliding door *j* regulates the draught. A baffle *k*, provided with an aperture for the removal of soot, is fitted at the back of the receiver, the products of combustion escape by an uptake *l* attached to, or formed integrally with, the receiver.



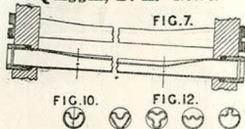
24,637. Gronwald, H., and Vacuum Kochapparat Ges. Nov. 3.



Boiling-pans.—Relates to heating or cooking apparatus in which the heating or cooking vessel is surrounded by a vacuum jacket *5*, which may communicate with a chamber *10* in the vessel and contains a small quantity of liquid which is converted into vapour. The jacket *5* is connected by a pipe *6* to an air-pump, and is supplied with liquid through a pipe *7*. If too much liquid passes into the jacket, the excess may be drawn through the pipe *6* and trapped in a reservoir *14*. The air-pipe *6* may be provided with an adjustable extension *15* arranged so that its lower end is at the level of the amount of liquid that can be completely converted into steam and fill the steam spaces. The reservoir *14* may also serve as a condenser if any steam is inadvertently drawn from the jacket *5*. A gauge *13* shows the amount of water withdrawn. A corresponding amount of water is then added to the jacket. A portable field cooking-apparatus is also described and illustrated. The boiler, which is

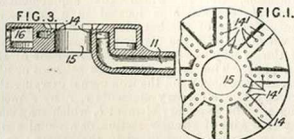
mounted above a fire-place, has its jacket connected to an air-pump placed in front of the boiler.

24,745. Quiggin, D. A. Nov. 5.



Heating water.—In surface apparatus for heating or evaporating water by steam, the heat-transmitting surfaces consists of straight tubes which are formed with longitudinal troughs on their upper sides and are arranged to collect and convey the drainage resulting from the condensation of the steam. As shown in Figs. 7 and 10, the tubes are crescent-shaped in cross-section. The tubes may be arranged with a slope, and the longitudinal grooves may increase in depth towards one end. Water of condensation flows along the groove and falls from the tubes at the ends into a sump in the condenser casing. To facilitate the drainage, the troughs may be spirally deflected round the tubes at the deeper end. The tubes may be of the forms shown in Fig. 12. Cross slots may be formed in the tube ends, which are circular, to allow the tubes to be turned by means of a screwdriver when they are being "boiled out" to remove grease.

24,798. Collins, E. N. Nov. 5.

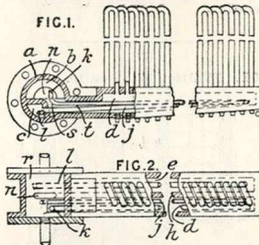


Heating water.—A gas burner is constructed so that the waste heat is utilized in heating water contained in the burner. The intercommunicating water chambers 16, shown in the sectional view, Fig. 3, occupy the spaces between radial lines of jets 14' supplied with gas through a tube 11 and chambers 14. An air opening 15 is left in the centre. The water chambers communicate with a reservoir by means of tubes (not shown).

25,097. Smith, M. H. Nov. 7.

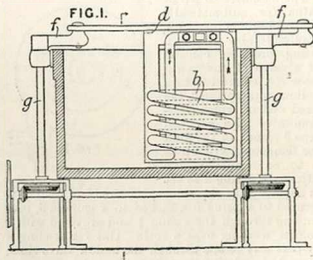
Heating gases and liquids.—Relates to tubular heat-exchange apparatus such as air-heaters, condensers, &c., wherein inverted U-tubes connect supply and exhaust chambers d , e , which are

formed by a hollow mounting divided longitudinally by a partition h , the two chambers being in communication at one end with entrance and exit chambers b , c formed by a partition r in the



drum a . To avoid short-circuiting and the escape of steam, the usual aperture in the partition h is replaced by an arrangement of pipes. A baffle n is also placed in the chamber b near the entrance to the supply chamber. A pipe j conveying liquid of condensation connects the supply chamber d at a point remote from the entrance with the exit chamber c . The pipe j may be wholly within the chamber d . A pipe k may lead steam from the entrance chamber to the extremity of the chamber d . A pipe l may also extend from the extremity of the exhaust chamber e to the exit chamber c . Several elements may be bolted together through the flange of the drum a . The partition r dividing the drum or the walls of the drum is formed so as to produce a downwardly-inclined supply duct t extending from the chamber b to a supply channel l leading to the chamber d .

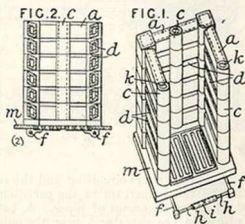
25,308. Barham, A. S. Nov. 9.



Heating liquids.—A coil b , through which a

heating-liquid is passed, is suspended by a bar *d* in a rectangular vat between two cranks *f* which cause the coil to move in a circular path. The cranks are mounted on shafts *g*, rotated through bevel-gearing. Specification No. 26,578, A.D. 1904, is referred to.

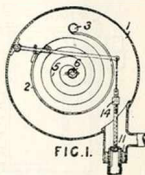
25,401. Müller, H. Nov. 10.



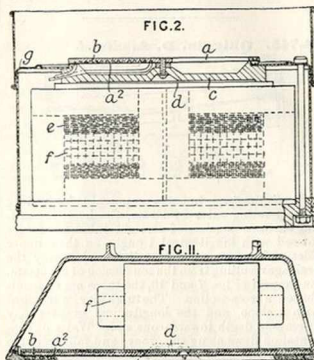
Heating water.—The sectional boiler, shown in Fig. 1 and in section in Fig. 2, is adapted for being placed within, or surrounded by a stove or suitable casing of brickwork or other material. Superimposed hollow elements *a* are provided at the ends of their arms and at their middles with apertures *c*, for the reception of pipe sockets *k*, connecting each two adjacent members. The elements are strengthened at their corners. The pipes secured to the uppermost heating-element are connected with the radiators.

25,405. Meyer, J. H. Nov. 10.

Thermostats.—A apparatus for automatically controlling temperature, applicable also for regulating pressure, consists of a valve 11 and ventilator &c. connected to a hollow spiral spring 2, the fixed end of which communicates with a closed pipe 3 placed in the fluid the temperature of which is to be regulated. To adjust the spring 2 to act at any desired temperature, the free end thereof is secured to a spring 5 attached to a spindle 6, protruding through the casing 1 and provided with a pointer working over a scale. Gas for feeding a by-pass may escape through the hollow valve stem, a nut 14 regulating its passage through an aperture into the stem.



25,411. Berry, A. F. Nov. 10.



Heating by electricity; heating liquids.—In electric heating-apparatus, such as cooking-apparatus, boilers, grillers, and hand-irons, of the induced current type, the secondary circuit includes a supplementary element which acts as a primary element to a tertiary circuit forming the heating-device proper, so that the tertiary circuit is heated by induction as well as by conduction. Fig. 2 shows an apparatus for heating kettles, saucepans, &c. in which the supplementary secondary element *b* is located in a groove on the underside of the hot plate *a*. A metal plate *a'* which protects the element *b* from the action of the air may be attached to the underside of the hot plate. The hot plate and an asbestos or like carrier *c* are held upon the iron core *d* carrying the primary and secondary elements *e*, *f* by a metal ring *g*. The secondary element *b*, which may consist of a wire of circular section or a metal strip, may be insulated and fitted in the groove; or it may be insulated, by means of enamel &c., after being placed in the groove. In a modification, the conductor with the carrier *c* is enclosed within a divided metal casing. In another arrangement, the top is cast on a spiral partition of brass which forms the groove for the conductor *b*. More than one layer of secondary elements may be employed, and the top plate may be perforated. When employed as a heat-radiating screen, the tertiary element consists of metal rings. Fig. 11 shows a hand-iron in which the supplementary element *b* is held in place by a metal plate *a'*. A layer of insulating-material separates the plate *a'* from the core *d* carrying the primary and secondary elements.

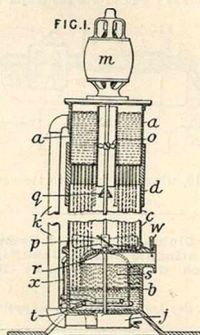
25,472. Toyn, H. Nov. 12.

Non-conducting coverings and compositions.—A heat non-conducting composition is composed of the following ingredients, preferably in the proportions specified, namely: yellow clay 30 parts, asbestos 15 parts, slag-wool 17.5 parts, fossil meal 17.5 parts, papier mâché 12.5 parts, binding-material such as hemp or flax waste 5 parts, and slaked lime 2.5 parts, or the lime may be omitted. It may be moulded into bricks and slabs.

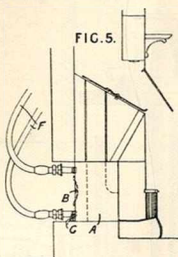
25,633. Evenden, R. E., and Baring J. L. Nov. 13.

Heating air.—In apparatus for moistening, washing, and removing dust from air, means are provided for heating the air. Water falling from a vessel *a* through a casing *c* into a vessel *b* induces a current of air through the openings between spaced stays *d*, and is returned to the vessel *a* by a pump *j* driven by an electromotor *m*. A heating-medium is circulated through a coil *t* in the vessel *b*.

(For Figure see next column.)

25,663.**26,263. Martin, P. J.** Nov. 20.

Heating water.—To diminish incrustation and to facilitate cleaning &c., boilers for heating water for domestic purposes &c. are constructed so that one portion extends beyond the influence of the fire and is directly accessible. This portion is fitted with a hand-hole *B*, a draw-off cock *C*, and circulating-pipes *F*, the latter being of lead to diminish furring. In the application to an open grate, shown in Fig. 5, the boiler *A* extends through the wall at the back; this form is stated to be particularly suitable for heating greenhouses. In another arrangement, the boiler is sufficiently long to pass through the wall into the scullery, or through the side of the chimney breast. In other modifications for portable ranges, the boiler is rectangular or of T-shape, with the hand-hole &c. at one side above the hot-plate.

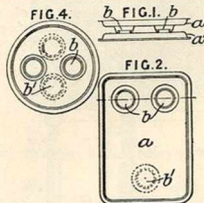


In the application to an open grate, shown in Fig. 5, the boiler *A* extends through the wall at the back; this form is stated to be particularly suitable for heating greenhouses. In another arrangement, the boiler is sufficiently long to pass through the wall into the scullery, or through the side of the chimney breast. In other modifications for portable ranges, the boiler is rectangular or of T-shape, with the hand-hole &c. at one side above the hot-plate.

26,464. Bergmann, T. Nov. 22.

Heating gases and liquids.—Surface apparatus for heating and cooling fluids and for condensing steam, applicable as a motor-car radiator, comprises a

series of rimmed trays *a, a'* secured together to form elements having intercommunicating apertures *b, b'*, Figs. 1 and 2, arranged so as to cause the fluid to separate into two streams in passing into one

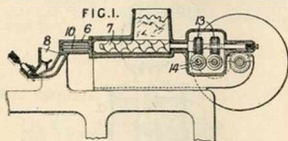


element and again to unite in flowing therefrom, or vice versa. In the construction shown in plan in Fig. 4, the non-coincident inlets and outlets *b, b'* for each element are equal in number.

26,692. Keller & Son, J., and Boyd, W. Nov. 24.

Heating liquids.—In a process of reheating cream used for making fondants, chocolate centres, &c., graining or firing of the cream is prevented by breaking it up and passing it through small tubes or channels heated by steam which does not come into contact with the cream. The heater consists of a closed vessel, having steam inlet and outlet pipes and being traversed by pipes 10. The

heater is attached to a feed-apparatus which may consist of screws 7 which force the cream through

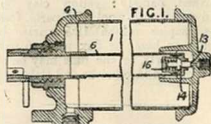


the tubes 10, whence it falls into the depositing-hopper 8.

26,754. Cloud, J. W., and Compagnie Internationale pour le Chauffage des Chemins de Fer Systeme Heintz.
Nov. 24.

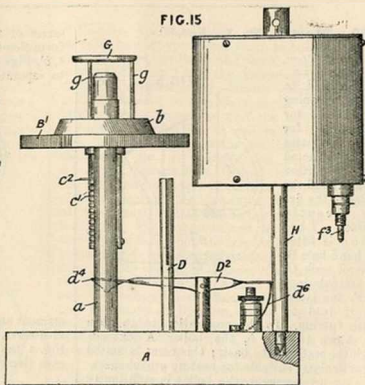
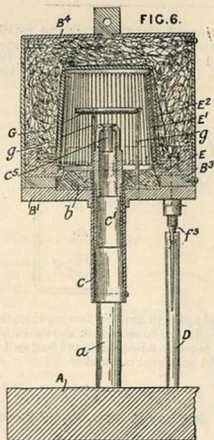
Thermostats; heating buildings.—Apparatus for

automatically controlling the admission of steam to a heater or heating-system comprises two concentric tubes 1, the annular space between which receives the steam admitted at 13. The inner tube



is open to the atmosphere at one end where it is screw-threaded into the cap 4, while at the other end it carries a valve 14 adapted to close the orifice 13 at the desired temperature by the differential expansion of the two tubes. A spring 16 is interposed between the inner tube and the valve. In its adaptation to a steam heating-system, the device is placed in the circuit so as to control the steam supply to the circulating injector.

26,929. Roach, F. E. Nov. 27.

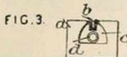


Thermostats.—An electric furnace is provided with a device for switching off the current when a predetermined temperature has been attained. A sleeve C projects downwards from the middle of the fixed base B¹ of the furnace and contains a tube c, Fig. 6, having a finger c¹, Fig. 15, which passes through a vertical slot in the sleeve. The upper part of the tube is of refractory material and

is shaped so as to support a fusible slug c² by means of a shoulder upon the latter. The tube is moved vertically to adjust the slug within the furnace or within the base B¹, and is retained in position by turning the finger c¹ into one of a series of horizontal slots in the sleeve, or by means of a lever (not shown) which engages the finger. This lever is pivoted to a ring on one of the pillars a and

is adjustable along the opposite pillar, which is graduated. A lever D^2 has one end formed into a pan d^1 vertically below the tube C , and the other into a catch to retain the end of a spring d^2 , with which it completes the electric circuit through the furnace until the lever is tilted by the fall of the slug into the pan.

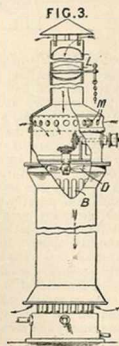
26,954. Kaiser, C. F., and Riche, C. G.
Nov. 28, 1905, [date applied for under Patents Act, 1901].



Heating by electricity.—Apparatus for singeing or torrefying threads consists of a long rectangular box or case a of slateite, refractory earth, or other refractory material, provided with a longitudinal passage c for a coiled wire d or other resistance adapted to be heated by an electric current. By these or by other means, the thin walls of a groove b shaped for the passage of the thread are rendered incandescent, and the latter is singed. The walls of the groove constitute part of the material of the box or case a . The apparatus may be modified to singe several threads simultaneously. The Specification in the original form as published under the Act of 1901 describes also the singeing of fabrics, a form of apparatus being employed in which the part to be rendered incandescent is preferably arranged to project from the box or case. The subject-matter does not appear in the Complete Specification as accepted.

27,070. Haylock, R. H., Pochin, F. H., and Pochin, H. S. Nov. 28.

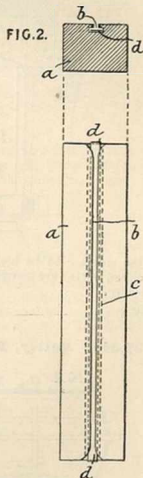
Heating air; heating buildings.—In air-heating apparatus for warming rooms, the air is drawn by a fan D either from the exterior through a valved shaft L , or from the apartment itself through a valve M , and is circulated downwardly among the heating-pipes B , emerging near the floor. The heater is preferably of the type in which tubes B extend vertically from a steam-chest, and contain longitudinal partitions to deflect a portion of the steam up each tube on one side of the partition and down on the other. The fan D may be arranged on an horizontal axis and the shaft L may



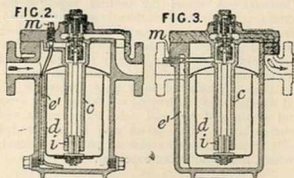
be dispensed with. The entire apparatus may be raised slightly above the floor, and secured to a column.

27,128. Kaiser, C. F. Nov. 28.

Heating by electricity.—Relates to the apparatus for torrefying or singeing threads described in Specification No. 26,954, A.D. 1906. A slot is made in the bottom of the thread channel or groove, or the bottom is omitted entirely, so that the resistance d radiates its heat directly on to the thread. Fig. 2 shows the refractory block a furnished with a longitudinal groove b enlarged towards the centre to form a passage c for the resistance d , which preferably consists of a strip of platinum coated with iridium or rhodium. The resistance d may be made integral with the refractory body by electrolytically or otherwise coating the latter with metal. The resistance may be fixed to the refractory body by means of a heat-resistant plaster or varnish.

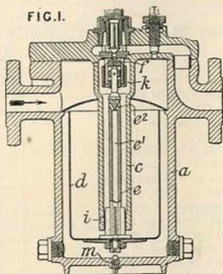


27,325. Mayer, I., and Mayer, E. Nov. 30.



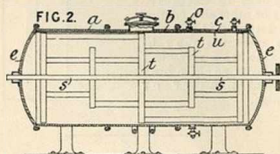
Steam traps.—In traps of the bucket type, means are provided whereby a portion of the water surrounding the bucket is blown out at each discharge. In the arrangement shown in Fig. 1, the space below the bucket d is connected with the space k surrounding the discharge valve f by a passage e^1 and ports e^2 in the stem e of the bucket. The discharge passage e^1 may be formed by a separate

pipe as shown in Fig. 2, or may be cast in the side of the trap as shown in Fig. 3. A set-screw *m* controls the passage *e'*. To enable the water in



the sleeve *c* to be blown out before the valve *f* closes, ports *i* are provided in the lower end of the sleeve.

27,343. **Bailey, R. D.** Dec. 1.

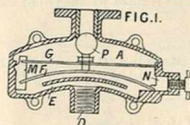


Digesters.—A vessel for boiling together de-husked maize grits with sulphuric acid in the production of brewers' wort consists of a vertical or horizontal cylinder formed of steel rings *a*, *b*, *c* and end plates *e* coated internally with glass fused on to the metal. The vessel is fitted with a perforated pipe *u* connected to a water supply *o*, an axial wooden shaft *s* carrying wooden stirring-arms *t*, and steam and hot and cold water inlets and discharge pipes. The vessel may be surrounded wholly or partly with a steam or hot-water jacket, or with a non-conducting covering.

27,357. **Hayton, J. W. P., Longley, J. W., and Slack, J. E.** Dec. 1.

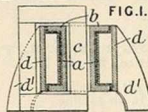
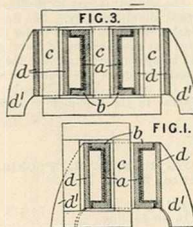
Steam traps.—In a steam trap of the expansion type, a straight and a bowed expansible member are employed, and are so arranged that the expansion of the former serves to increase the curvature

of the other and therefore the movement of the valve which it carries. The valve *P*, controlling the admission of steam and water to the box *A*, is attached to a bowed expansible tube or strip *F*,



one end of which is adjustably held at *N* while the other extremity bears against an arm of a lever *M* operated by the longitudinal movement of the straight expansible strip *G*. An arched piece *E* placed above the raised outlet *D* forms a water seal, preventing the escape of any steam until the water has been completely blown out.

27,421. **Reynolds, A.** Dec. 1.



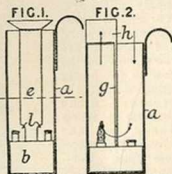
Heating by electricity.—In electric transformers arranged for heating, in which the heat is due solely to the iron and copper losses in the short-circuited secondary and in the core, the heat is radiated from special surfaces adapted to convey heat directly from the secondary or core. In the form of the apparatus shown in Fig. 1, the primary coil *a* wound on an insulated spool *b* encircles an iron core *c*. A cast-iron ring *d* having radiating wings *d'*, which also serve as feet for the apparatus, surrounds the primary, and may either itself serve as the secondary circuit, or the wings *d'* may be circumferentially slotted to receive a closed band or bands of copper. In a modification, Fig. 3, the transformer core *c* has a two-path magnetic circuit, and the secondary consists of a double cylinder of magnetic material *d*, *d'* connected by webs, which also serve as radiating gills, radiating feet *d'* being formed on the outer cylinder. The arrangement of the primary and secondary coils may be modified, and several radiators may be connected together.

27,498. Pöschl, A. Dec. 3.

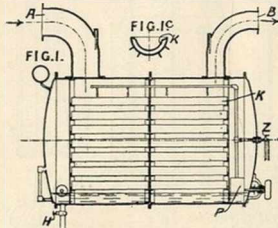
Heating liquids.

—Portable apparatus for immersion in the liquid to be heated consists of a cylindrical casing *a*, Fig. 1, closed at the bottom and fitted with an oil or spirit lamp *b*. Air is supplied to the burners through a central tube *e* with apertures *l*.

Fig. 2 shows the casing *a* with a central partition *g*, forming passages for the air and heated products. The passage for the latter is fitted with an extension *h*.



27,942. Maschinenfabrik Oerliken, Wüthrich, G., and Stirnimann, E. Dec. 7.

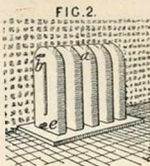


Heat-storing apparatus.—In regenerative accumulators for receiving an intermittent supply of exhaust steam from an engine and delivery steam continuously to a low-pressure turbine, a substance which changes its physical condition within the limits of the temperature of the steam is employed for absorbing and giving out heat alternately. Among the substances mentioned are naphthalene, beta-naphthol, and certain acetates or mixtures of acetates. As shown in Fig. 1, the material is contained in the double walls of the channels *K*, shown in section in Fig. 1c. Steam enters at *A* and is withdrawn at *B*. Water collecting at the bottom is pumped up to the highest trough by the pump *P*. When necessary, water is drawn off at *H* or admitted at *Z*. In a modification, concentric tubes surrounded by water are substituted for the channels *K*.

28,196. Ekstein, E., and Borsdorf, W. Dec. 11.

Heating buildings.

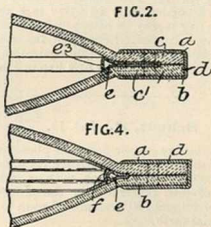
—Radiator units for hot-water or steam heating-systems are constructed of ceramic material in single pieces, and are either partly or wholly unglazed to allow the percolation of the moisture through into the atmosphere. The body of the radiator *a* is provided with an inlet *b* and an outlet at the other end, the connexion *e* being provided for joining the units.



28,261. Nathan, L. Dec. 29, 1905, [date applied for under Patents Act, 1901].

Heating liquids.—In addition to heating wort by means of steam coils or their equivalent, an electric heater of high temperature is suspended or otherwise arranged in the copper. The electric heater or the wort may be agitated.

28,331. Brooks, J. B. Dec. 12.

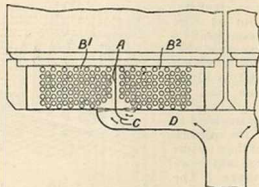


Hot-water bags and the like.—Rubber sheets *a, b* for making these articles are joined together both by vulcanizing and by stitches or rivets *c, c'*. Exterior and interior strips *d, e, f* may be added as shown.

28,416. Howden, J. Dec. 13.

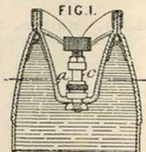
Heating air.—In a Howden or other air-heater, the pipe *D*, supplying air to the two sections *B', B''* of the heater, is divided into two equal

portions by a curved prolongation C of the partition A so as to produce an equalization of flow to the sections.



28,451. Brooks, J. B. Dec. 13.

Hot-water bags.—The metallic or similar valve attachment for hot-water bottles, or water beds or cushions, is inset within the receptacle, so as not to protrude beyond its general surface and so as to be cushioned by the contained fluid. As shown in Fig. 1, the valve c is secured to a cup-shaped piece a, which is attached at its mouth to the material of the bottle, so that it lies inside. According to the Provisional Specification, the cup-shaped portion may be fitted in a corner of a folded-in or in-curved edge; or the mouthpiece may be retained in one position against an interior wall of the bottle by means of a flap or tab.



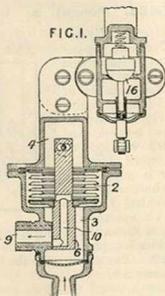
28,468. Schudt, H. Dec. 13.

Non-conducting compositions.—A plastic composition consists of linseed oil, molten resin, infusorial earth, glue, and soap solution, with or without the addition of tow, preferably in the proportion of 1½ litres of oil and 150 grammes of resin to 10 kilos of infusorial earth.

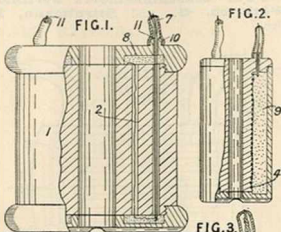
28,495. Deutsche Continental Gas Ges., and Mucke, F. Dec. 15, 1905, [date applied for under Patents Act, 1901].

Heating liquids.—In a device for opening the gas valve of a liquid heater as soon as the flow of liquid to the heater is started, an elastic box-diaphragm or the like 2, which carries a valve 6 interposed in the water supply to the heater and is connected by a lever &c. to the gas valve 16, divides a casing into two chambers, of which one 4 is exposed to the pressure on the heater side 9 of

the valve 6 and the other 3 to the supply pressure. Normally, these pressures are equal and the valves are closed, but on the flow to the heater being started the pressure in the chamber 4 is reduced and the valves 6, 16 therefore open. Communication is made with the chamber 4 through a passage 10 in the valve 6 or through a by-pass pipe.



28,549. Stapledon, C. H. Dec. 14. No Patent granted (Sealing fee not paid).

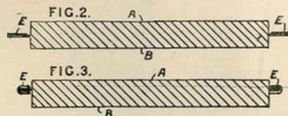


Heating liquids.—In a submissible electric liquid-heater of the kind described in Specification No. 10,310, A.D. 1906, the covers are sealed by arranging packing-material over the wire conduits, so that the wires are insulated independently of the covers. As shown in Figs. 1 and 2, annular recesses 8, arranged over the ends

of the conduits 2 containing the heating-wire, are filled with sealing-material. The covers are screwed on the ends of the body portion 1. Main wires 11, doubled to avoid heating, are inserted through nipples 10 formed integral with the upper cover and pass down to the lower end of the conduits, where they are connected to the heating-wire. The main wires are insulated outside the cover by rubber tubes 7. The double main wires 11 may be replaced by a single stout wire 13, as shown in Fig. 3. The upper end of the wire is formed with

an eye and surrounded by a circular block 14. The lower end of the wire has a loop or bend to prevent its removal. Fig. 2 shows a modification in which the heating-wire 4 is coiled around a central hollow core which is screwed into an outer casing, the annular space between the casing and the core being filled with insulating-material 9.

28,842. Foy, F. Dec. 18.

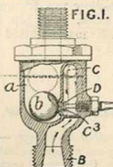


Heating liquids.—Relates to a method of forming corrugated rectangular tubes applicable to liquid heaters. A sheet-metal plate A is inserted between the folded edges of a second plate B, the space between the plates being occupied by a fusible or soluble core. The edges E are again

folded, forming the joints shown in Fig. 3. The plate is then corrugated by rolls or dies which at the same time crush or caulk the joints. The core is afterwards melted or dissolved out. The tubes may in one form of apparatus connect upper and lower liquid headers.

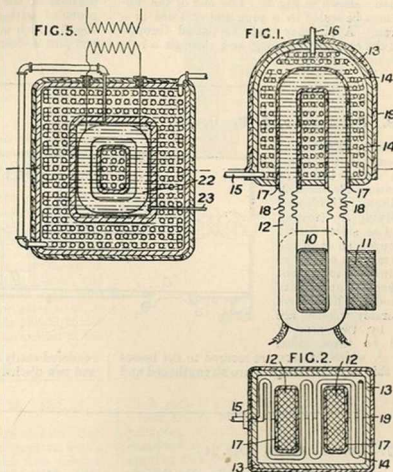
29,034. Malcolm, A., and MacPherson, A. Dec. 20.

Steam traps.—A steam trap for draining steam pipes and cylinders consists of a box a, containing an aluminium, brass, or cork ball-float b which, when the water has escaped, closes the opening c¹ in one limb of a siphon C, the other leg of which opens to the outlet B. The valve seating may be formed of woodite, and a screw-down valve D is provided to prevent or retard the escape of fluid when desired.



29,120. British Thomson-Houston Co., [General Electric Co.], Dec. 21.

Heating liquids.—Relates to an electric heater for fluids of the induced alternating-current type, in which heat is produced in a body designed to act both as an hysteretic core and as a closed secondary. The heavy secondary 12, Figs. 1 and 2, of an external transformer having a primary 10 and magnetic core 11 is surrounded by tubes 14 formed as passages in a magnetic shell or casing 13 jacketed with a non-conductor 17, 19; this shell forms the secondary and core within which heat due to hysteresis and eddy currents is produced. Liquid is caused to circulate through the tubes, which may be employed for generating steam or heating circulating water or oil, and enters and leaves by the pipes 15, 16, respectively. The coil 12 is narrowed or cut away at 18, as shown, so as to obviate the transfer of heat from the shell to the primary 10 without materially affecting the electric conduction. In one modification, the heating-coil is entirely surrounded by the casing; in a further modification, Fig. 5, the heating-coil 22 is arranged so that liquid entering at 23 may first circulate round it, and thence pass through the tubes contained in the casing as before.

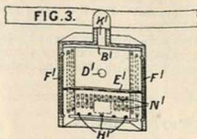


may first circulate round it, and thence pass through the tubes contained in the casing as before.

29,344. Drabble, H. Dec. 24.

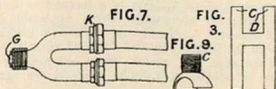
Heating water.—In a greenhouse gas water-heater, the air supply for the burners is heated in a chamber just above the burners and is led to the burner chamber by pipes which pass through the water space. The apparatus consists of two closed chambers separated by a partition E'. The air enters the upper chamber at D', is heated by the burners H' in the lower chamber, and flows through the pipes F' to the lower chamber. The combustion products pass through the hollow back and the hollow top B', and thence to the outlet K'.

The sides, back, top, flue, and the partition E' are formed by water-containing chambers. Water-tubes N' may be fitted.



29,349. Ford, W. Dec. 24.

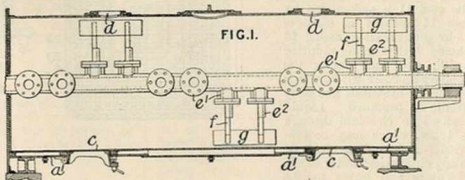
Heating buildings.—Relates to tubular circulating-coils for radiators, refrigerators, &c., in which the return ends of the coils are provided with projecting nipples which may receive plugs or caps. To facilitate the replacement of a damaged piece of tube, the straight portions of the coils may be connected to end tubular contrivances by means of screw unions K. To facilitate cleaning the tubes, a U-shaped bend or other part of the coil may be drilled and fitted with the screwed connexion c shown in Fig. 9. The end of the connexion may be sealed by a plug and enclosed in a metal cap. A pin may then be passed through holes in the cap and the plug, and through a hole



on a projection G of the plug; or a lock-nut may be screwed on to the projection. The straight portions of the tubes may be connected by bends provided with two openings C, D, as shown in Fig. 3, which are closed by the screw plugs, caps, and pins as described above.

29,378. Johnstone, J. F. Dec. 24.

Digesters.—Relates to improvements in the apparatus described in Specification No. 25,660, A.D. 1898, [Abridgment Class Drying], for treating offal. The steam jacket a' is stopped short of the bottom man-holes c as shown in order to prevent the leakage of steam into the cylinder. The scrapers g, preferably wooden, are carried by two arms f bolted to three-sided sockets e', which in turn are secured to the bosses e'. In this way the scrapers are strengthened and



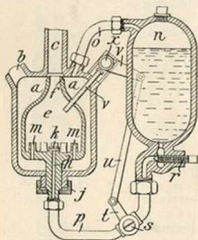
rendered easily replaceable. Two suction pipes d and two discharge openings c are provided.

29,397. Jones, A. E. Dec. 24.

Heating air.—An apparatus for heating the compressed air supplied to the engine of a torpedo is described. Air from the reservoir enters the chamber a by the pipe b, part of it passing directly to

the outlet pipe c, while the remainder circulates around the heating-bell e and enters it through a series of nozzles m, thence passing upwards to the outlet c. The quantity of air which passes directly

into the pipe *c* is regulated by adjusting the position of the nozzle *f* by the nut *j*. The liquid fuel stored in a reservoir *n* passes by gravity through the pipe *p* to the heating-bell, in which

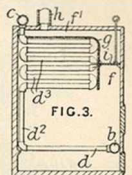


it is sprayed by a plate *k* and ignited by the flame from a slow-burning cartridge. The cartridge is exploded by a percussion mechanism *x* which is actuated by the links *t, u, v* when the cock *s* is opened during the launching of the torpedo. A second connexion is made by a pipe *o* between

the chamber *a* and reservoir *n*, so that the flow of the fuel may be independent of the air pressure. A needle valve *r* controls the fuel supply.

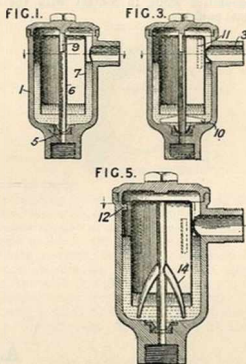
29,474. Fihelly, T. Dec. 26, 1905, [date applied for under Patents Act, 1901].

Heating water.—Boilers for hot-water or steam heating apparatus are composed of sinuous tubes *d* communicating above and below with transverse collectors *c, b*. The collector *b* is connected with each sinuous tube *d, d'*, which form the bottom and back of the grate; the sides of the grate are formed by sinuous tubes. Ordinary fire-bars are fitted between the tubes *d*. The nest of tubes *d'* is covered at the top and front by a baffle or diaphragm *g*, leaving spaces *f, f'* through which the gases pass to the outlet *h*. A damper *i* is fitted in the passage *f*.



29,625. Fickels, W. D. Dec. 29.

Steam traps.—Relates to water relief valves or traps principally employed upon steam systems to discharge the water of condensation. A casing 1, Fig. 1, is provided with a removable cap, and contains a float 7 which controls the discharge valve 6. The valve seat 5 is located in a conical fitting, as shown, below the bottom of the casing so that the valve is guided on to its seat when closing. The valve and float are guided at the top by a guide pin 9. The bottom of the casing preferably slopes to the centre so that any solid matter will be readily discharged. In a modification, shown in Fig. 3, the valve is fitted with stirrers 10 to agitate the water, the float being fitted with wings 11 on which the liquid impinges as it enters by a tangential inlet 3 so that the valve is rotated. In the construction shown in Fig. 5, the top of the float is entirely closed, and the float is loosely guided by lugs 12. Air vent tubes 14 are provided on the hollow valve stem, as shown; these also serve to agitate the liquid so that solid matter is not allowed to collect at the bottom of the casing.

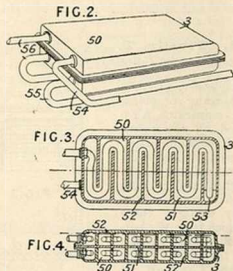


29,680. Rutherford, E. J. Y. Dec. 31.

Heating water &c.—A construction of feedwater-heater is described and shown in connexion with a steam-propelled motor-car in which the exhaust steam from the engine is used to heat the feedwater. A chamber 50 is formed in two parts bolted together and separated by a partition 51.

Each part is provided with a series of baffles 52 which are so arranged that a sinuous conduit is produced in each chamber, the conduit being in communication with each other at one end of the apparatus through an aperture 53 in the horizontal position 51. Inlet and outlet pipes 54, 55 are provided, and communicate with the chamber 50 at the end opposite to the aperture 52 at positions,

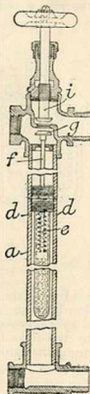
respectively, above and below the partition 51, by which means the exhaust from the engine is caused to traverse the whole length of the conduit



formed by the baffles and partition. The feed-water pipe 56 is formed to coincide with the exhaust-steam conduit, and is so arranged that the hot exhaust on entering comes into contact with the part of the feed-water pipe containing the heated feed-water, the cooled exhaust steam leaving the economizer while in contact with the cold water just entering.

29,755. Paetow, H. Dec. 31.

Thermostats.—In a thermostatic apparatus for regulating the admission of heating-medium to heating apparatus by the temperature of the medium on leaving, a pipe *a* connected with the pipe leading from the apparatus is provided with springs *d*, so as to ensure a continuous flow of heating-medium round a receptacle *e* for mercury, which on expanding or contracting operates, through a piston and rod *f*, the valve *g* controlling the admission. On the opposite side of the valve seat, another is arranged for receiving a screw-down valve *i*.



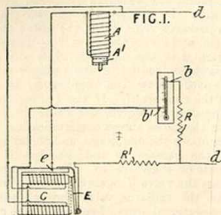
A.D. 1907.

45. Boaz, J. E. Jan. 1. No Patent granted (Sealing fee not paid).

Thermostats &c.—In heating-systems, a thermometer &c. is adapted at a predetermined temperature to close a circuit containing an electro-magnet, which is arranged either to operate directly a valve &c., or to break a circuit containing a valve-

operating electro-magnet. The wires *d*, Fig. 1, are connected to the electric supply, and the circuit is completed through the electro-magnet *A*, which has its armature *A'* connected to a valve, damper, &c., the frame *e*, and the armature or switch *E* of the electro-magnet *C*. When the temperature causes electric connexion to be made between *b*

and b^1 , the electro-magnet C is energized, and the consequent attraction of its armature E breaks the circuit through A and releases the armature A'.



Resistances R, R' may be employed in the several circuits.

[Reference has been directed under Section 7 of Patents & c. Act, 1907, to Specifications No. 10,569, A.D. 1893, Nos. 1704, 5009, and 17,103, A.D. 1904, and No. 11,970, A.D. 1906.]

418. Mewes, R. Jan. 7

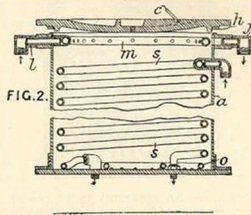


Heating air; heating liquids.—Relates to tubular elements applicable to apparatus for heating &c. in which several independent tubes of cylindrical or other section are united together by soldering or other means. The elements consisting of the united tubes *a* are filled with paraffin &c. and are then rolled flat. They are afterwards corrugated in any direction. The tubes may be of prismatic, oval, elliptical, or of other cross-section.

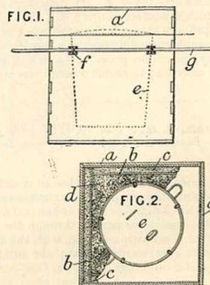
420. Baker, E. B. Jan. 7.

Digesters.—An apparatus adapted for curing meat, or tanning or otherwise treating hides or leathers or other materials with impregnating matter, comprises a chamber *a* provided with a heating or cooling coil S and an air-exhaust pipe *j*. Liquid is forced into the chamber by a suitable pump connected to the pipe *l*, which leads to a perforated coil *m*, and after circulation leaves by a coil O which may be connected to the pump or to a suitable receiver. The hides &c. are supported on a series of parallel bars, or perforated shelves which rest on brackets extending along the chamber sides. The lid *h* is provided with means of suspension *c* and with slots in its edge into which enter securing-bolts pivoted to the top of the chamber. Alternatively, the chamber *a* may be mounted on an hydraulic ram by which it can be forced against a

fixed cover. A thermometer and pressure gage are provided. The liquid may be forced in succession through a series of such chambers.



433. Gonella, A., and Scarfiotti, M. Jan. 7.



Non-conducting coverings.—A rotatable receptacle for keeping liquids, food-stuffs, &c. at a low temperature consists of an outer casing *a* and inner removable walls *b*, the intervening space being packed with sawdust, tan, tow, asbestos waste, or other non conducting material. The space *d* between the walls *b* and the receptacle *e* is filled with asbestos, wool, felt, or other packing. The outer casing is filled with lugs *f* for the carrying-sticks *g*. Specification No. 27,350, A.D. 1904, is referred to.

580. Ingham, W. P. Jan. 9.

Heating-apparatus.—To prevent the condensation of steam on mirrors, the mirrors are heated by hot water which flows through a pipe or pipes or through a chamber in contact with or close to the back of the mirror. To increase the heating-surface, a sheet of copper may be placed between the pipes and the mirror.

722. Felix, J. Jan. 10.

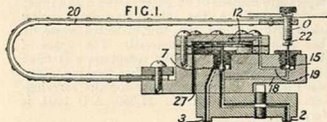


Heating air.—An apparatus to be placed in a fire-place, stove, &c. for heating, ventilating, and purifying structures consists of a chamber A having air inlet or outlet pipes C, D, which form the sole supports for the apparatus. The chamber A may be fitted with fire-tubes E. It may contain substances which disinfect, purify, or filter the air during its passage through the apparatus, or it may contain a substance generating a purifying gas such as oxygen. The pipes C, D, which may be detachable, may lead to rooms where there is no fire.

963. Bush, C. A. Jan. 15, 1906. [date applied for under Patents Act, 1901]. Drawings to Specification.

Heating buildings &c.—Relates to a combined internal-combustion engine, air-compressor, and compressed-air engine. The exhaust from the compressed-air engine is passed through the jacket of the internal-combustion engine, with the exhaust of which it is afterwards mixed; the mixture is used for heating buildings.

1159. Nash, N. E. Jan. 16.

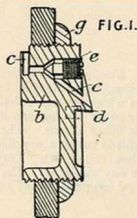


Thermostats.—In that class of apparatus in which the movements of a thermostat control the passage of compressed air to the diaphragm valve of a radiator, a special arrangement of air passages and valves is described, to minimize loss of the compressed air. The inlet 2 for the latter, and the outlet 3 leading to the radiator valve, communicate with a valve chamber containing a double-seated valve 7 controlled by a diaphragm 12. The space above the diaphragm communicates

with a second chamber containing a double-seated valve 15, operated by the steel and zinc blade 20 through a screwed stem 22 and adjustable pointer-carrying screw *o*. If the temperature is below the desired point, the valve 15 is forced against its upper seat; the compressed air thus has access through passages 2, 18, 19 to the space above the diaphragm, and forces the valve 7 to cut off communication with the outlet 3, while any pressure in the passages leading to the radiator valve, and in the space below the diaphragm, is released through the conduit 27. If the temperature rises above the desired degree, the blade 20 depresses the valve 15, and so allows communication between the space above the diaphragm and the atmosphere, through the passage 19 and the channel around the spindle of the valve 15. The compressed air then raises the valve 7 against its upper seat, and passes to the radiator valve through passage 3. The cross-sectional areas of certain of the passages, and the spindle of the valve 15, are so arranged that the valves move suddenly, with the result that no compressed air is wasted, except that in the spaces above and below the diaphragm and in the conduit leading to the radiator valve.

1370. Haden, J. P., Haden, W. N., and Haden, C. I., [trading as Haden & Sons, G. N.], and Wats, C. J. Jan. 18.

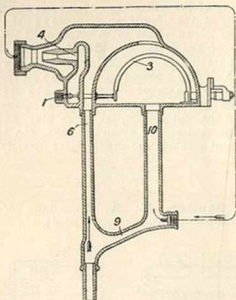
Heating buildings.—The plugs of radiators are formed so as to contain the air-escape valve. The plug *b* is fitted with an external thread for screwing into the radiator and is held in position by a lock-nut *g*. An air-passage *c* is formed from near the edge of the plug and terminates at any suitable place outside the radiator. A screw or spindle valve *e* is arranged so that it can seal or throttle the passage *c*. The plug is so arranged that the opening *c* is at the top. A lip *d* prevents any water from trickling down the outside of the radiator.



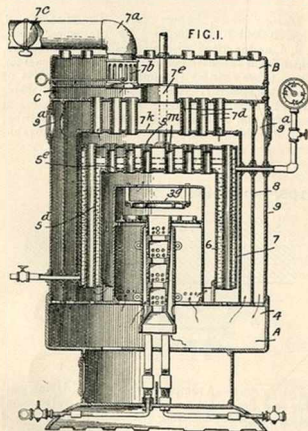
1680. Skipworth, G. P. Jan. 22.

Heating buildings; thermostats &c.—Relates to a heating-system in which a mixture of air and steam is circulated by an injector controlled by a thermostatic device. The thermostat 3, controlling the steam inlet 1 to the injector 4, is influenced solely by the return vapours of the system, which enter the casing containing the thermostat by the pipe 10. The air inlet 6 communicates directly with the system without influencing the thermostat. To drain water of condensation, the return pipe may be connected to the lower end

of the air pipe by a passage 9 which may contain a non-return valve.



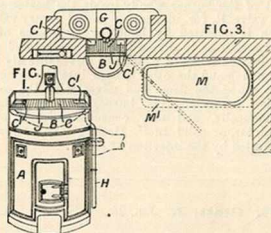
1706. Blanchard, V. W. Jan. 22, 1906, [date applied for under Patents Act, 1901].



Heating water.—A gas stove for generating mixtures of hot air and combustion products for heating rooms &c., or for producing hot pure air, is adapted also for heating water or generating steam for use in heating-apparatus. The apparatus, which is a modification of the stove described

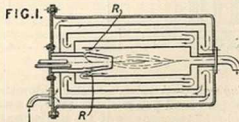
in Specification No. 109, A.D. 1900, and is heated by the burner 3 described in Specification No. 1703, A.D. 1907, [both in *Abridgment Class Stoves &c.*], consists of a series of cylinders 4, 7, 8, 9 and a water-heater or steam generator 6; the baffle 3^d may form the top of the cylinder 4. The hot gases from the burner circulate between the cylinders 4, 6, 7 and pass through the fire-tubes 5^d, 5^e. The tubes 5^e are partly closed by perforated plugs 5^m. Air enters the stove at the apertures 9^a, passes downwards to the distributing-chamber A, and thence to various parts of the stove.

1776. Cornes, J., and Haighton, W. Jan. 23.



Boiling-pans.—In a combined copper and sink or washing-basin, preferably arranged in conjunction with a bath, the sink or washing basin B is hinged above a copper A, a draining-board C, with scap receptacles C', being also provided. A channel J conveys to the waste pipe H the water escaping from the sink when turned up. The combustion products from the fire of the range G &c. may be diverted, by means of dampers, to heat the copper. The bath M may be supplied with hot water by a pipe leading from the copper, and is provided with a cover M'.

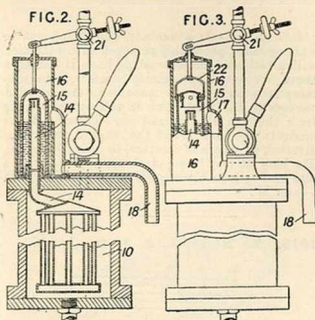
1919. Le Rond, L. J. J.-E. Jan. 25.



Heating air and gases.—Air or gas is compressed by a pump to a high pressure, and is then passed through a heater direct to a motor. The heater may utilize the waste heat from steam-engines, internal-combustion engines, furnaces, stoves and

fire-places, &c., or it may be provided with a burner. In the case of a furnace, a surface heater is arranged in the path of the gases to the chimney, this heater being provided with baffle-plates, series of tubes of any shape, smooth or alternately widened and reduced, straight or coiled, or provided with helical or straight ribs, disks, or rings. Heaters which are provided with burners preferably have the heat generated in the midst of the compressed gas passing therethrough. Fig. 1 shows such a heater, which consumes alcohol or like fuel; it is divided in known manner by concentric partitions into annular flues so that the compressed gas has to pass in a zigzag path from the circumference to the centre, and thereby gradually attains the temperature of the flame by the time it reaches the burner, while losses by radiation are minimized. The apparatus is characterized by the arrangement of the burner wholly inside the heater, and by a valve R, for instance a ported rotary valve, which is operated by hand, or by means of a governor, so as to divide the hot compressed gas into two currents, of which one serves directly for combustion and the other passes into the annular space round the flame and mixes with the combustion products. The burner may be lighted automatically, and may consume mineral oils, petrol, tar, or solid fuel. Heating may, however, be effected by the injection of steam.

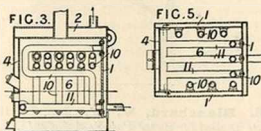
1950. Stott, J. Jan. 25.



Heating water.—A valve, operated automatically by the displacement power of the water, is used for controlling the temperature of the issuing water in a geyser of the type described in Specification No. 7610, A.D. 1906. The water, having been heated to practically the boiling point in the steam chamber 10, rises through the pipe 14 until it overflows into the bell 15 and thence passes under the bottom of the bell into the expansion chamber 16; it then

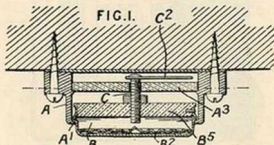
flows away down the pipe 18. If the water becomes too highly heated in its passage through the tubes in the chamber 10, the extra pressure due to the boiling of the water causes it to lift the bell 15 and so, by means of a lever connected to the regulating tap 21, to admit more water until the temperature of the water is reduced to just below boiling point again. A relief valve 22 allows any steam which may collect in the bell to escape into the expansion chamber 16 and thence to the open air. The bell may be connected to either the steam or the water cock, and gas may be used instead of steam. In a modification, the bell is pivoted and actuates the supply valve directly.

2017. Keller, K. A. R. Jan. 26. No Patent granted (Sealing fee not paid).



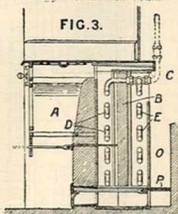
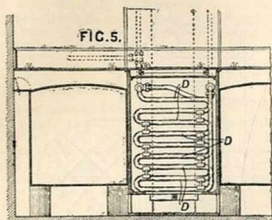
Heating water, boilers for. The fire-box 6, Figs. 3 and 5, is enclosed by the water spaces 1, 2, 4, and is fitted with a series of bent tubes 10, which form the main portion of the heating surface. These tubes connect the upper and lower parts of the water spaces 1. The grate is formed of water tubes 11, communicating with the water spaces at the sides and back and with the longitudinal tubes 10. The sides and top of the boiler are removable.

2106. Francombe, F. W. Jan. 28.



Thermostats.—A temperature-operated device, suitable as a fire-alarm or for operating a valve, comprises a capsule consisting of volatile liquid enclosed between a corrugated disk B' and the rigid face of the casing B. Upon expansion taking place, contact is made by the disk B' with an adjustable screw C, provided with a pointer C' moving over a dial A'. The capsule casing B, provided with an ebonite cover B'', is supported on a flange A' of the main casing A.

2181. Menzies, C. Jan. 29.



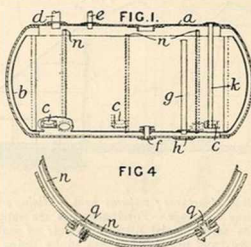
Heating water.—The hot gases from the fire of a cooking-range are led over pipes fitted at the back of the range and connected with a hot-water tank and supply pipe. The gases from the fire-place A pass down the front side of the partition B underneath it, and then up the farther side into the flue C. The pipes are arranged in two zigzag rows D, E, one on each side of the partition, and are connected to the hot-water tank and supply pipe in the usual manner. Dampers may be arranged to direct the gases round the ovens before passing over the pipes E. A foot-box O, with a door P, prevents the pipes from being damaged when the flue is cleaned. All parts are readily removable for repairs or cleaning. A rectangular boiler, connected to the pipes D, E, may be used instead of the fire-brick partition B.

2442. Laeuffer, J. Jan. 31, 1906, [date applied for under Patents Act, 1901].

Non-conducting compositions.—A composition consisting of vegetable matter, such as sawdust, straw, stall refuse, corn stalks, or tan bark, with Portland cement, plaster of paris, and swine blood, and with or without sulphur, sugar, or oil, is used as a wood or stone substitute. The composition is fire-proof, a non-conductor of heat and electricity, and practically waterproof. The blood is aged before use, and a mixture of creosote and paraffin may be used to coat the moulded blocks. The Specification in the original form as published

under the Act of 1901 describes also the addition of small quantities of animal hair and cream-floated barytes. This subject-matter does not appear in the Complete Specification as accepted.

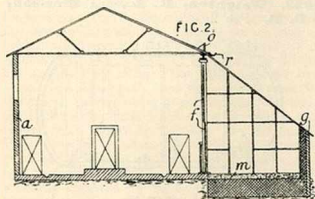
2622. Weighton, R. L., and Morison, D. B. Feb. 2.



Heating water.—In an apparatus, applicable at electric power stations, on warships &c., as a feed-water heater and storage reservoir, an outer steam-holding shell *a*, which is subjected to the full steam load, encloses an inner water-holding tank *b* arranged to be free from stresses due to steam pressure. The inner tank fills the interior of the shell with the exception of a narrow annular space adapted to hold steam, the shell being so arranged that the whole of its interior surface is exposed to the same temperature. The tank *b*, which is supported by blocks *c* &c., may have an open top into which the steam supply pipe *d* and the water supply pipe *e* project. The heated water is discharged through a pipe *f*, or through an overflow pipe *g* which discharges through an opening *h* in the outer shell. Water of condensation from the space between the shell and the tank also escapes by the opening *h*. The piping may be placed outside the tank. A blow-off pipe *k* is also provided. To permit the inside of the shell to be examined, the tank may be adapted to be rotated. In the arrangement shown in Fig. 4, rollers *q* mounted on blocks are passed through openings in the shell which are normally closed by doors. The rollers, which preferably bear against strengthening-hoops *n* on the tank, raise the tank off the blocks *c*. The rollers may be attached to the doors. In other arrangements, the tank rests on trunnions supported in bearings in the outer shell. The apparatus may be arranged vertically; or an axial tube, containing an inner stay and supported in bearings in the shell, may support the tank. In a modification applicable for use on ships, the top of the tank is closed and steam is admitted to the upper part of the interior of the tank by tubes which are in communication with the space between the tank and the outer shell. The heater may be used to generate steam of low pressure.

Two heaters, used alternately, may be combined with a steam generator.

2788. Saul, M. Feb. 4.



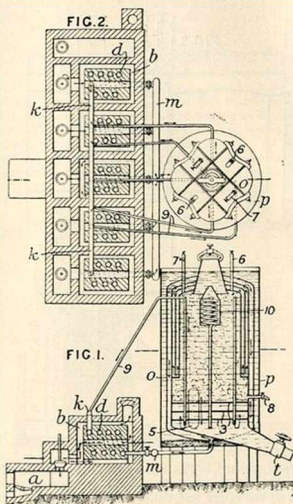
Heating structures; natural heat, utilizing; non-conducting coverings.—Forcing-houses are supplied with the warm, moist nitrogenous air of stables, byres, &c., and are further heated by lining the walls with dung. In the construction shown in Fig. 2, the forcing-house *g* is built against one wall of the stable *a*, while the intervening removable division is composed of vertically slidable panes of glass *f*. The walls of the forcing-house are insulated by means of layers of dung, which is also contained in a ditch under the sand floor *m*. A snow trap *o* and gutter *r* prevent snow &c. from falling from the stable roof upon the glass roof of the forcing-house.

2994. Karysheff, A. A. de. Feb. 6.

Heating liquids; digesters.—The apparatus shown in Figs. 1 and 2 is used for treating vegetable matter, with aluminium and magnesium hydrates and an alkaline solution under a pressure of 12 to 15 atmospheres at a temperature of 200° C. The mixture is placed upon the upper of three sieves 3, and the alkaline solution is introduced through pipes 6 until the apparatus is completely full. The annular space between the outer boilers *o*, *p* is then closed, and heat is admitted from a furnace *a* to chambers *l*, which contain heating-coils *d* embedded in refractory material. The hot water from these coils passes into a collecting-pipe *k* and thence through pipes 9 to the internal boiler, circulating between the various walls as indicated by the arrows, until it reaches the collecting-pipe *m* and the heating-coils *d*. From time to time samples are taken through pet cocks 8, air and steam are allowed to escape through valves in the pipes 7, heavy bodies such as silica are removed through the valve *l*, and the treated material is discharged through an opening 5. At a further stage, material is charged into the boiler and the whole is heated by steam entering through a coil 10.

(For Figures see next column.)

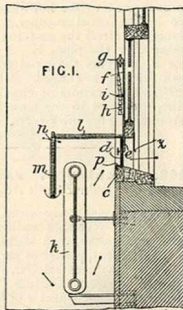
2994.



3006. Nesbit, D. M. Feb. 6.

Heating buildings.

—The incoming air for ventilating apartments, wards, and the like passes through an opening in the window or casement covered with a filtering-medium and over a radiator or other heater before entering the room. The lower sash is made shorter than usual so as to leave, when closed, an opening between the bottom sash rail and the frame through which the air enters, the amount being regulated by slides *e*, louvers, or hinged shutters. The air is guided before entering the room over a radiator *k* by a glass



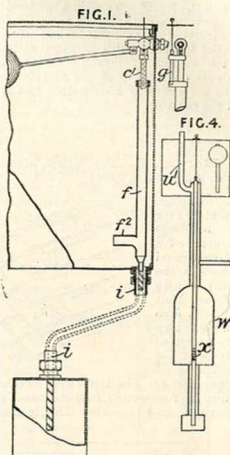
shelf *l* and a glass front shield *m*, in which are openings *n* regulated by a shutter or louver device. Similar side shields may be used, if necessary. In other forms, the air-inlet opening is arranged in the top or sides of the window.

3027.

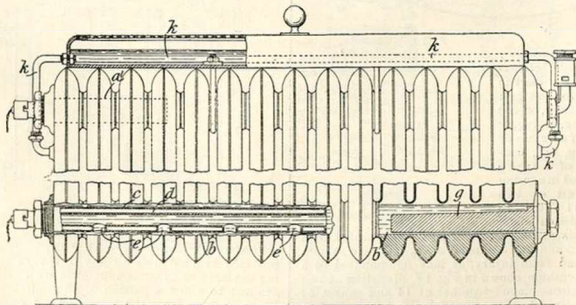
3027. Preston, J. R. Feb. 7.

Heating water.—In apparatus for domestic hot-water supply, such as that described in Specification No. 19,512, A.D. 1906, the flow and return pipes are arranged one within the other to save separate connexions for the circulating-pipes. The return pipe also serves to convey the feed-water from the tank or ball tap to the boiler. Means are provided for lifting or removing the inner tube. As shown in Fig. 1, the return pipe is placed within the flow pipe *i*. The return pipe has an extension *f* in a cistern into which the water supply pipe *c*¹ depends. The pipe *f* is suspended from a collar on the pipe *c*¹ and is provided with a rod *g* extending through the lid of the cistern, so that the inner pipe may be easily lifted. The pipe *f* has at its lower end an opening *f*² which allows circulation of the water between the cistern and the boiler. In modifications, the inner return pipe is separate from the inlet pipe *c*¹ and may be bent over at its upper end. The inlet pipe reaches nearly to the bottom of the cistern. Fig. 4 shows another arrangement in which a hot-water cylinder *w* is placed between the cistern and the boiler. The inner return pipe passing from the tank to the boiler is perforated at *x*. The outer flow pipe has an escape pipe *u*.

(For Figures see next column.)



3078. Nobbs, C. G., and Nobbs, C. G. Feb. 7.



Heating buildings; heating by electricity; heating liquids.—In an electrically-heated steam radiator, an electric heating-element is immersed in a small quantity of liquid contained in the lower part of the radiator. The heater, which may be inserted

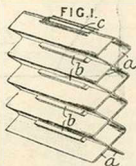
in the lower limb *b*, may consist of two concentric cylinders *c, d*. The liquid may be admitted to the interior of the inner chamber by passages *e*. The heating-wire is wound on the outside of the inner cylinder. The steam generated may be superheated

by a second heating-element a' ; or, according to the Provisional Specification, by a part of the element which heats the liquid. To adjust the level of the water or the volume of the liquid, an adjustable plug g may be inserted in the lower limb b . The lower parts of the loops may also be filled with lead to reduce the volume of liquid. An evaporating-basin, placed on the top of the radiator, may be heated by a steam-pipe k connected to the steam space of the radiator.

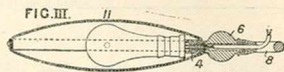
3088. Moreux, G. Feb. 7, 1906, [date applied for under Patents Act, 1901].

Heating buildings.

—A radiator for heating buildings is constructed of a series of corrugated metal sheets a , the contiguous bends of which are bent backwards at b so that when the sheets are assembled a gap is left for the reception of the heating-pipe c . The latter may be other than rectangular in cross-section, in which case the shape of the corrugations b is correspondingly altered.

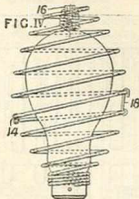


3116. Cunningham, J. G. S. Feb. 7.

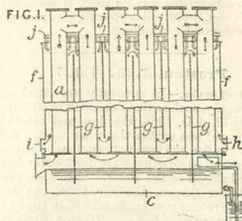


Bed-warmers; heating by electricity.

—An electric heater for use as a bed-warmer, or for warming, drying, or airing fabrics or clothing, &c., consists of a lamp mounted in a casing formed of two plates 11 . The lamp is fitted to a holder which is attached to a nipple 4 , connected to a handle 6 and ring 8 outside the casing. To protect the lamp from injury, it may be mounted in a spring cushion, shown in Fig. IV, consisting of two wire helices hinged together at 14 and connected by a clip 18 . The upper helix has a portion embracing a short tube 16 in which the sealing point of the lamp fits.

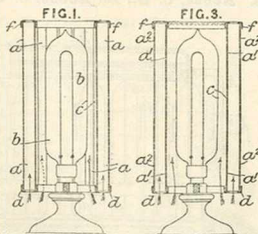


3138. Rowan, F. J., and Dempster, R. & J. Dec. 10.



Heating air.—The waste heat in ammonia-recovery plant, employed in connexion with the condensing and cooling apparatus of gas-producers &c., is utilized to heat air required for the producer blast. Means are also provided for moistening the air. The pipes a through which the gases pass are enclosed in a casing f provided with an air inlet h and an outlet i . Between the pipes, baffle-plates g extend from the tar-collecting vessels c , and from the top of the casing, distributing-devices j are arranged so that water &c. flows down the outer surfaces of the pipes. The pipes and baffles may be corrugated, fluted, or formed with projecting baffles. Series of pipes may be arranged in parallel rows.

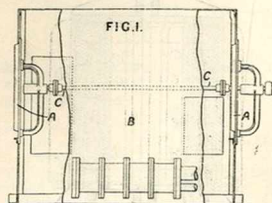
3226. Holmes, A. B. Feb. 9.



Heating by electricity.—An electric heater is provided with a double air-way or space surrounding the lamp or other heating-element, and is also adapted to allow a portion of the light from the latter to issue from the apparatus. A concentric ring of tubes a , Fig. 1, open at both ends and preferably made of brass, copper, &c., is placed round the lamp b , and supported by channelled rings d, f , which are perforated to correspond with the open ends of the tubes. Air passes through, and is

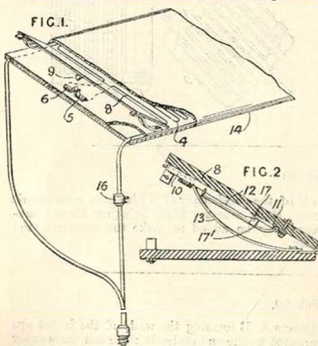
heated in the tubes *a* and also the space *c* between the lamp and the tubes, which is open at the top and bottom, and light issues from the lamp through the spaces between the tubes. In a modification, shown in Fig. 3, the lamp is surrounded by two concentric tubes *a'*, *a''*, which may be provided with openings covered by a translucent material, and are supported in perforated rings *d*, *f*.

3487. Mower, C. H., and Thursfield, G. R. Feb. 12.



Heating gases.—A pair of fans *A* are arranged on a shaft *C* on opposite walls of a heater *B*. They work in series and create a current of air through the heater, the air current being broken up by the heater in its passage.

3543. Shellhamer, L. W. April 2, 1906, [date applied for under Patents Act, 1901].



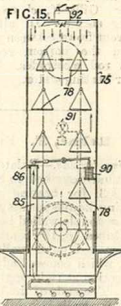
Heating by electricity.—Pads for applying heat generated by electricity to the human body are

provided with a switch operated by the weight of the body so as automatically to break circuit when the pad is not in use. A resistance wire 4 is secured to the surface of the pad, which is covered by a slip 14. An ordinary switch 16 is provided in the electric leads; in addition, a weight-operated plug switch is inserted in the resistance wire. The switch consists of two contacts 5, 6 attached to the base of the pad, and a plug 9 attached to a hinged leaf 8, which is normally held up by springs 13. The contact 9 is secured to the end of a bar 10, hinged to the leaf at 11 and pressed upwards by a light wire spring 12. In order to obtain a rapid break when the weight of the user is removed from the pad, the engagement between the plug 9 and the contacts 5, 6 is such that the bar 10 will turn on its hinge until it engages the turned-over end 17' of the stop 17, and thus permit the springs 13 to withdraw the stud 9 from the contacts.

3682. Savy, A. H. Feb. 14.

Heating apparatus; thermostats.

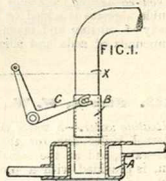
—A stove 75 for heating chocolate moulds is heated by means of hot air entering through a pipe 85 fitted with a valve 86 operated by an electro-magnet 90 under the control of a thermostat 91. The air is circulated by means of a fan 92. The filling-apparatus of the machine and also a chamber through which the returning empty moulds pass are heated and maintained at a constant temperature by similar means.



3704. Moore, S. Bramley. Feb. 14.

Heating air; thermostats.

—In internal-combustion engines using a liquid fuel, the orifice of the air-inlet pipe is provided with a heating-device so arranged that the temperature of the air may be varied as desired. As shown in Fig. 1,

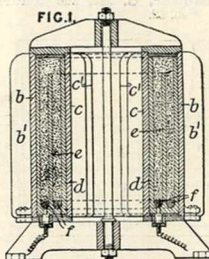


the orifice of the air-pipe X is arranged above or below an annular chamber A heated by the exhaust of the engine or by the cooling-water. A sleeve B sliding in or on the chamber A or on the inlet pipe X is operated by a bell-crank lever C or other means so that the air entering the pipe is caused to

pass more or less into the chamber. In lieu of an annular chamber, a band may be provided in the exhaust or water pipe and the sleeve arranged to slide over it. By connecting the sleeve with a float resting on a column of mercury, the device may be rendered automatic in action.

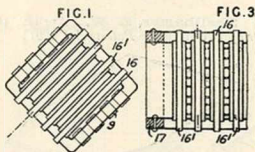
3915. Reynolds, A. Feb. 16.

Heating by electricity; heating water.—The air of rooms, carriages, &c. is heated by the passage of a current through powdered carbon, or through a mixture of powdered carbon and material of greater resistivity enclosed within walls of carbon or iron, provided with radiating gills and with or without a lining of electrically insulating but thermally conducting material. In Fig. 1, two concentric cast-iron cylinders *b*, *c* are fitted with a non-conducting lining *d*. The space between the cylinders is filled with the carbon mixture, and contact is made by electrodes *f*. An insulating-partition *e* causes the current to travel up and down the cylinder. Gills *b'*, *c'* are fitted to increase the radiating surface. In alternative arrangements, the current flows between annular electrodes at the top and the bottom respectively, or between vertical rod electrodes. The apparatus may be used for heating water.



4124. Rehn, F. Feb. 19

Heating liquids.—Relates to portable apparatus of the kind described in Specification No. 22,560, A.D. 1903, for heating and evaporating or refrigerating liquids in vats &c. by immersion therein. A hollow double-walled body is provided with concentric tubes 16, 16', connecting opposite sides of the inner and outer walls, and with short cross-tubes 9, which connect adjacent walls and extend in a direction at right-angles to that of the tubes 16, 16'. The ends of the body are open, the space between the walls being closed as at 17. In a modification, the body is open along one edge to allow the body to expand without straining the tubes.



4193. Liverpool Borax Co., and Fry, A. Feb. 20.

Non-conducting coverings and compositions.—A soluble alginate is added to borax mud, consisting chiefly of calcium and magnesium carbonates and compounds of soda and silica, the mixture being

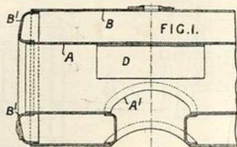
made of the consistency of a plastic or semi-plastic mass. Hair, asbestos fibre, or other fibrous substance may be added to make the material bind firmly.

4222. Strode, W. W., and Holmes, C. A. Feb. 20.

Heating water.—A water jacket placed around an external boiler flue for the purpose of heating feed-water, and at the same time reducing radiation, is provided with a protection plate at that part subjected to the greatest heat. The concentric

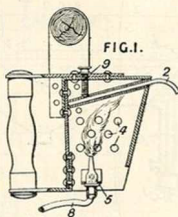
cylinders A, B forming the walls of the jacket are connected by the end plates B'; the hot gases enter by the aperture A', strike the protection plate D, and pass along the central shaft, which constitutes the flue. Water is admitted and drawn off by

suitable connexions, and the necessary man-holes are provided; the chamber may be of any shape to suit the construction of the flue.



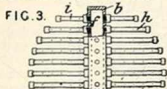
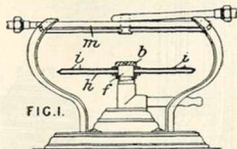
4256. Storm, J. H., and Haselen, P. H. van. Feb. 20.

Heating by electricity.—In removing paint from a painted surface, the surface is heated by radiant heat and is scraped by a tool which is combined with the heating appliance. A burner 5, supplied with combustible from a reservoir by a flexible tube 8, is surrounded by a perforated casing 4.



A scraper 2 is attached by a screw 9 or is screwed into the casing. The heating-agent may be acetylene gas, petroleum, &c., or an electric heater may be used.

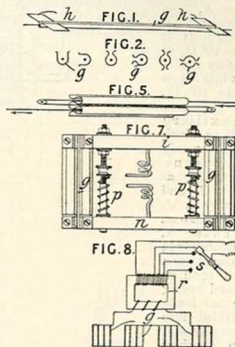
4264. Schmidt, H. Feb. 20.



Heating air; heating water.—Apparatus for heating air or water comprises a closely-wound horizontal spiral coil *m*, through which the fluid is passed, and which is heated by a burner *b*. The burner consists of a distributing-pipe *f*, from which

project burner tubes *h*, having perforations *i* corresponding with the coil turns.

4550. Gin, G., and Courtecuisse, V. Feb. 25.

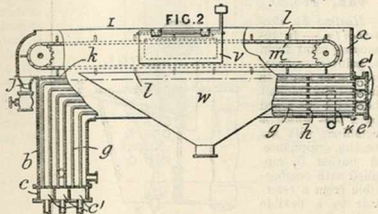
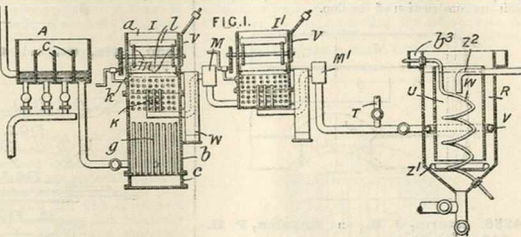


Heating by electricity.—In the singeing of yarns and threads, the material is passed through one or more split, opened, or divided metallic tubes of platinum, iridium, rhodium, &c., which are heated electrically and may be of any of the sections shown in Figs. 1 and 2; or a number of tubes or channels may be formed side by side by folding a single piece of sheet metal in the manner shown in Fig. 5, the tubes being provided with ears *h* for connexion to electric terminals. To prevent distortion of the tubes during heating, a number of them are secured at one end to a cross-piece *i*, Fig. 7, which is fixed in position, while the other ends are secured to a cross-piece *n* which is free to move either by being suspended from the lower ends of the tubes, which are arranged in a vertical or inclined position, or by being arranged to slide on rods carrying springs *p*. Fig. 8 shows an electric arrangement whereby the temperature may be regulated &c. The current is passed through a transformer *r* through a number of groups of tubes arranged in series, the tubes of each group being arranged in parallel, while the current to the transformer is regulated by means of a number of contact-studs and a switch *S*. When a single long tube is employed and the natural access of air to it is insufficient, a stream of air may be directed by a blower into the tube, and the latter may be contracted at the part where the blast enters to compensate for the cooling effect of the air current.

4620. Altolaguirre, M., and Zubillaga, J. Feb. 25.

Heating liquids.

—In apparatus for defecating cane juice, the liquid passes, after being limed, to a decanting-tank A, then to a primary heater I in which it is heated to 90° C., to a secondary heater P in which it is heated to 96° C., and, if necessary, to an auxiliary heater R in which it is heated nearly to boiling point. The tank A has partitions C, and preferably a V-shaped bottom. The heater I, shown separately in Fig. 2, comprises a casing a open at the top and having a leg b and heads c, e divided into steam-supply and eduction chambers c', e', respectively, each pair being connected by one or more pipes g. Steam is supplied to each chamber c' as the liquid level rises. Scum is removed through an outlet j by an endless carrier m having one or more rigid blades l resting upon horizontal supports k. One or more doors r may be provided, through which the scum is removed to a receiver w when the carrier m &c. is out of order. The juice flows through pipes K, placed on the further side of a partition h, and a receptacle M to the heater P, which is similar to the heater I but has no leg b, to a receptacle M', and then to a pipe T or by a circular pipe V with a downward discharge to the heater R, which is preferably upright and cylindrical and contains an open cylinder U. The cylinder U and pipe V facilitate the settling of the liquid. A coil W is connected at the top to a steam supply, and has a larger surface at the top than at the bottom. Scum is removed and placed in a box b² having a discharge pipe, and sediment and liquid are discharged by a stream of water from a circular pipe Z'. The juice is led off by a pipe Z' to triple-effect apparatus.



fitted with baffles 6, Fig. 5, and material 7 charged with gasoline &c. A pilot burner 13 is provided.

FIG. 2.

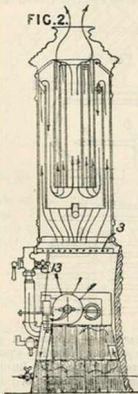


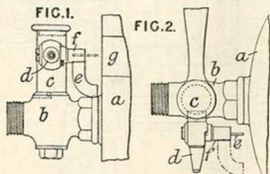
FIG. 5.



4686. Houdret, J. G. Feb. 26.

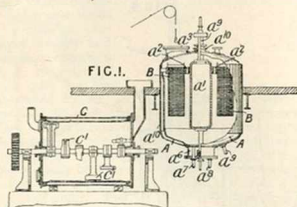
Heating water.—Apparatus intended chiefly for heating water for baths and composed of narrow annular water spaces arranged concentrically, as shown in Fig. 2. is fitted with a burner 3 using carburetted air. The air is carburetted in a reservoir, contained in the lower part of the apparatus and

the pilot-jet has been turned on, the tap *f* of the pilot-burner *d*, which is carried on the plug *c* of the main gas cock *b*, is provided with an arm *e*; when the tap *f* is shut, the arm *e* occupies the position



shown in full lines, so that it would come into contact with the geyser casing *a* if any attempt were made to open the main cock *b*. On the tap *f* being opened, however, the arm *e* is raised into the position shown in dotted lines, opposite the opening *g* in the casing *a*, and the main cock can then be turned to bring the pilot-jet in position to light the main burner.

5377. Holt, W. March 5.



Digesters.—A digester for extracting fats &c. from condemned meat &c. comprises a jacketed cylinder *A* enclosing a rotary hollow spindle *a*¹, which carries radial arms *a*² supporting the removable cylindrical wirework containers *B*. Steam is passed into the jacket *a*¹⁰, cylinder *A*, and spindle *a*¹, the extracted fat and size accumulating with the condensed steam in the neck *a*⁶, which is provided with a pipe *a*⁷ for the surface layer of fat to flow out, and with a pipe *a*⁸ for drawing off the whole mixture. After the extraction, the steam is cut off from the cylinder *A*, and the heat of the jacket *a*¹⁰ and spindle *a*¹ is used for drying the material left in the containers *B*, after which the latter is successively removed through the opening *a*⁹ to be discharged.

5285. Adcock, E. O. March 5.

Heating water.—To facilitate the disconnection and renewal of the tubes *a* of a water-tube boiler, the ends of the tubes are flanged and bent over at right-angles so as to enter the headers *b* at the top

or bottom face. The tubes are secured by bolts *c*, which pass through lugs *a*⁷ cast on the tubes and flanges *b*⁷ projecting from the faces of the headers.

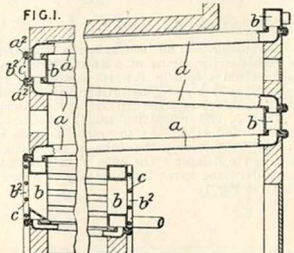
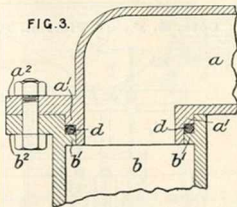
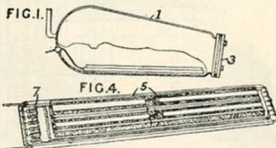


FIG. 3.



Tight joints are made by packing-rings *d*, which are placed between the flanges *a*¹, *b*¹ on the tubes and headers respectively.

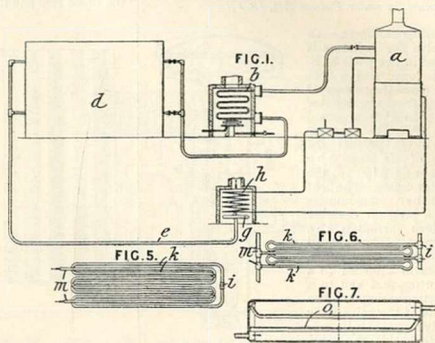
5575. British Thomson-Houston Co.,
[General Electric Co.], March 7.



Heating by electricity.—Crude electric-lamp filaments and the like are baked in a glass vessel *1*, Fig. 1, connected with a vacuum pump and having a removable cap *3*. The heater, consisting of iron resistance coils *7*, Fig. 4, between sheets of mica, rests on the bottom of the vessel but is separated therefrom by an aluminium plate. Above the upper sheet of mica is a thick copper plate on which rest graphite or carbon holders *5*, grooved to receive the bundles of bent incandescent bodies.

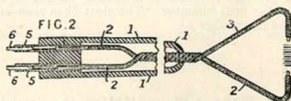
5757. **Humphrey, G. F.** March 9.

Heating by steam circulation.—Bakers' ovens are heated by superheated steam which, after circulating through the radiating devices, passes to the atmosphere or to a condenser, or it may be utilized for heating the feed-water for the steam generator. As shown in Fig. 1, the steam generated in the boiler *a* passes through the independently-controlled superheater *b* to the oven *d*, whence it flows through pipe *e* and escapes at *g* into the atmosphere, heating on its way the feed-water in the coil *h*. Suitable radiating coils are shown in Figs. 5 and 6, the steam entering at *i* and leaving at *m*. Fig. 7 shows a form of radiating-box fitted with longitudinal baffles *o*.

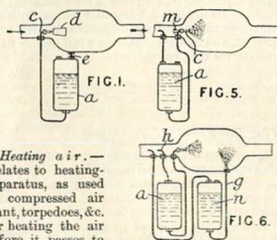


5937. **Lord, C. N.** March 12.

Heating by electricity.—Electric heaters for dentists' instruments &c. consist of a handle *l* enclosing conducting-wires *2, 3*, which terminate in small metal sockets *5*. These sockets are fitted with carbon or other electrodes *6*, which are placed in contact with the instrument to be heated. Electricity is supplied from a dry-cell battery, lighting system, or the like.



6081. **Armstrong, Whitworth, & Co., Sir W. G., and Sodeau, W. H.** March 13.

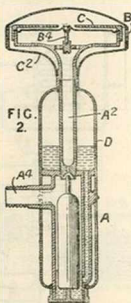


Heating air.—Relates to heating apparatus, as used in compressed air plant, torpedoes, &c. for heating the air before it passes to a motor, in which the energy of the air is increased by burning liquid fuel therein. The

fuel, water, or the like is supplied to the air or combustion products proportionally to the kinetic energy of the air passing a given section of the pipe leading the air to the engine. In one arrangement, a closed fuel tank *a*, Fig. 1, is connected to the combustion chamber by a pipe *e* and to a nozzle *c* pointing into an open cone piece *d*. In another arrangement, a Pitot tube *h*, which faces the current of air passing into the combustion chamber, is employed instead of the injector cone *d*. To increase the pressure on the fuel, a resistance may be placed between the Pitot tube *h* and the combustion chamber, or a reverse Pitot tube may spray the fuel into the chamber. In other arrangements, means such as a cone *m* aid the spraying of the fuel. In addition to the fuel chamber, a second chamber *n*, containing water, a solution of ammonia, salts, &c. may be connected to a Pitot tube and to the combustion chamber so as to mix water vapour &c. with the air or combustion products. The supply pipe *g* from the reservoir *n* may be continued in the combustion chamber as a coil terminating in a spray nozzle, so that the water &c. is heated before being sprayed.

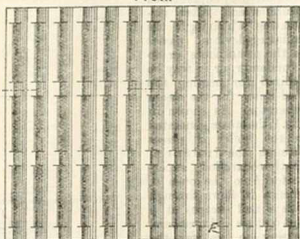
6178. Allen, E. P. March 26, 1906, [date applied for under Patents Act, 1901].

Heating buildings.—An air-valve for radiators is formed in two parts A, B. In the lower part, a float valve closes the passage A² leading from the radiator connexion A¹ to a second valve B¹. The valve B¹ serves to prevent the entry of air when the steam supply to the radiator ceases. The float chamber communicates with a pressure chamber D which surrounds the passage A². The valve B¹ closes an aperture in a diaphragm attached to a supporting-part and to a protecting casing C. The spindle of the valve B¹ is loosely mounted in its support to enable the valve to seat readily. In operation, air entering by the connexion A¹ flows up the passage D, past the valve B¹ into the casing of the upper part B, and escapes by openings C². When steam follows and passes the point controlled by the float valve, the air in the pressure chamber D is heated, forcing liquid into the float chamber. The float then rises and closes the passage A².

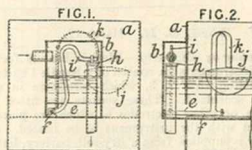


The joint in the tube is preferably arranged along the broad side and not along the edge.

FIG. 1.



6320. Ewart & Son, and Ewart, G. H. March 15



Heating water.—Relates to gas-regulators for water heaters. The gas valve chamber *b* is attached to the upper part of the casing *a* of the water-heater, and is in communication with it by an opening *e*, through which extends the spindle *f* carrying the arms *k*, *i* of the float *j* and the gas valve *h*. The fitting is adapted for use with the automatic device described in Specification No. 9749. A.D. 1902, and is such that the stuffing-box fitted in that device may be omitted.

6287. Behr, J. F., and Zoller, G. March 15.

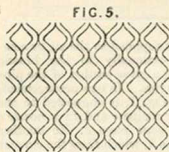


FIG. 5.



FIG. 4.

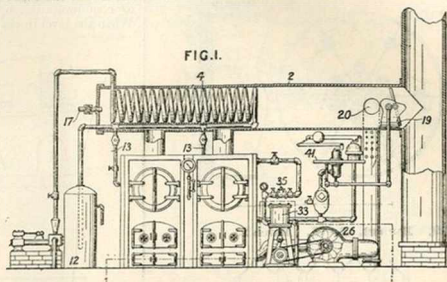
Heating buildings.—Tubes for radiators, surface condensers, &c. are made by making a flattened pipe out of a sheet of metal or by flattening a round tube. The flat tube is then filled with a gelatine plate having longitudinal fillets, and corrugated in rolls and pressed in dies. The filling-material is afterwards removed by placing the tube in boiling water. Protuberances *F* are left at intervals so that when the tubes are assembled, as shown in Figs. 4 and 5, air passages *B* will be left.

6475. Ziegler, J. J. March 18.

Non-conducting coverings and compositions.—The lathing or other material used for fixing plaster upon girders, struts, beams, and the like is soaked in magnesium-chloride solution and dried, after which it is immersed in a solution of silicic acid. The material is then fixed in position and covered with plaster in the usual manner.

6579. Miller, J., Winter, M., and Wurster, W. F. March 19.

Heating water.—In a steam-boiler furnace in which a portion of the combustion products is returned to consume smoke, a water-heater 4 is arranged in the flue 2 between the furnace and the return flue 20. Water may be supplied by it through pipes 13 to the boilers, or to a reservoir 12 for use in any suitable manner. A steam or air jet 17 is provided to remove soot &c. from the water-heating coil.



6623. Oltmanns, J. F. W. March 19.

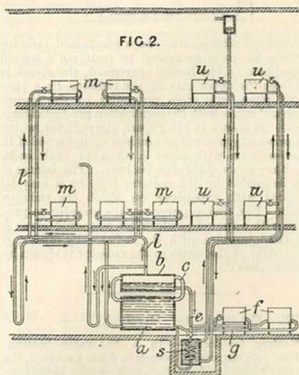
Drawings to Specification.

Non-conducting compositions.—A material for building-blocks, walls, heat non-conducting, and the like is made by soaking excelsior, straw, or

vegetable or other fibre in a binder, such as a mixture of plaster of paris and dextrin, squeezing to remove excess of binder, and moulding under slight pressure so as to form an initial body. The slab &c. may be coated with plaster, cement, or the like.

6727. Haden, C. I., [Meyer, R. O., (Firm of)]. March 20.

Heating buildings; heating by steam circulation; heating by water circulation; heating water.—In a combined low-pressure steam and hot-water heating-apparatus having upper and lower boilers *a*, *b*, connected with each other and with the heating-systems, the lower boiler *a*, which is filled with water, is connected with the steam space of the upper boiler *b*, so that the water cannot circulate before the steam circulation comes into operation. Fig. 2 shows one arrangement in which, when sufficient steam is generated in the lower boiler, water is carried through the pipes *c* to the upper boiler. The water then passes by a flow pipe *e* to radiators *f*, which are at or below the level of the boiler, and returns by a pipe *g* to the lower part of the lower boiler. The steam-supply pipe *l* leads steam to other radiators *u*, and the condensed water returns to the lower part of the boiler *a*. To supply water to radiators *u*, or baths &c. above the level of the boiler, a closed water tank *s*, connected to the radiators *u* &c. by flow and return pipes, is heated by a coil connected with the lower boiler and with the water space of the upper boiler.



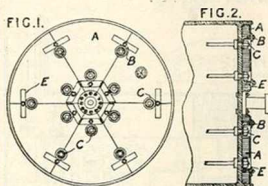
7096. Fuessli, C. H. March 25.

Non-conducting coverings.—The ends of steam-heated drying-cylinders, for example those used in sizing yarns, bleaching, and paper-making, are

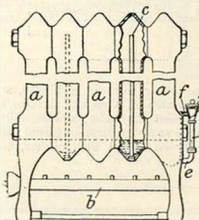
covered with cork in sections A, which are held in position by clips E secured to brackets B attached to the cylinder end by the existing stay-bolt nuts C.

(For Figures see next page.)

7096.



7102. Ewart, J. W. March 25.

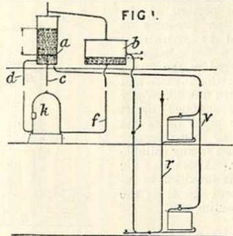


Heating buildings &c.—In a gas-heated radiator wherein steam is generated to maintain a humid atmosphere in the heated apartment, the steam is led from the upper part of the radiator, by a pipe or by pipes, into close proximity to the burner flame and mixes with the combustion products therefrom. As shown in the Figure, the radiator, which comprises any number of sections *a*, is provided in some sections with pipes *c*, open at both ends, which are screwed through its base. The burner *b* may be carried by the radiator legs, or it may be provided with extensions on which the radiator stands. For fitting purposes, the radiator is provided with a funnel *g*, which has a screwed cover *h* and communicates with the radiator by pipes *e*, *f*. The height of the water in the radiator is shown by a gauge-glass *d*.

7125. Goebel, A. March 25.

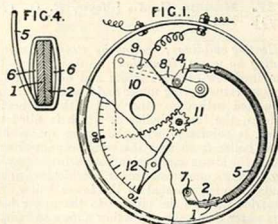
Heating buildings.—In a hot-water heating-system, two expansion vessels *a*, *b* are provided, the former, which is of smaller cross-section, being connected by pipes *c*, *d* with the boiler *k*, and by the flow pipe *e* with the main heating-system. The return pipe *r* terminates above the initial water level in the vessel *b*, which is connected to the boiler by a pipe *f*. The working of the system is stated to be as follows. When the level in the tank *a* rises owing to the increasing temperature of

the auxiliary circuit *c*, *d*, the level in *b* falls below the exit of the pipe *r* and a temporary interruption of communication between the pipes *r*, *f* occurs. When the level in the vessel *a* has reached a certain



height, the additional hydrostatic pressure, acting through the flow pipe *e*, produces a circulation through the heating-system, and the pipe *r* again discharges into the tank *b*, so that the level therein attains that of the exit point of the pipe *r*. The cycle may then recommence.

7127. Wurmb, T. H., and Baumann, R. March 25.



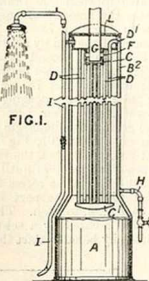
Thermostats &c.—The compound springs of bimetallic thermometers &c. are formed of two strips of metal 1, 2, Figs. 1 and 4, joined at their ends by rivets and by soldering, and a wire 5 is bound round the strips and soldered to their ends. The wire 5 is wound so as to leave a ventilation space 6, Fig. 4, between it and the strips 1, 2. The outer strip 1 is of steel, and the inner strip 2 of cold-rolled or hardened german silver, zinc, or zinc alloys, the wire 5 being preferably of the same material as the spring 2. Fig. 1 shows the application of the spring to an automatic fire-alarm. The spring is pivoted at 7 to the casing, and its free end 4 actuates the pivoted arm 8. The pointer 12 is set to the temperature at which the alarm is to be given, and a pinion 11 on the spindle of the

pointer turns a pivoted sector 10, a metal contact 9 on the latter thereby being set to a position corresponding to the position of the pointer 12. When the specified temperature is reached, the arm 8 touches the contact 9 and completes the alarm circuit.

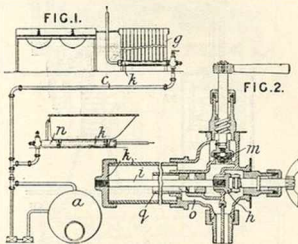
7142. Jackson, J. D. March 25.

Heating water.—

A water-heater for baths consists of an outer double casing, forming an annular water space B', and inner tubes D connecting upper and lower water vessels C, C'. The upper circular vessel C, which has a removable top plate L, has a depending chambered portion connected by tubes to the lower circular vessel C', which has a convex bottom. A chimney G passes through the top plate into the chambered portion and is connected to orifices in the side walls by passages F. The lower end of the annular space B' slopes outwards to the top of the burner chamber A. Water entering by a pipe H flows upwards through the space B' and through a pipe D' to the lower vessel C'. Thence it passes upwards through the tubes D into the vessel C and to the outflow pipe I. This is provided with a rose and safety-valve and also with an outlet to a plunge bath &c. The combustion products escape by passages F into the chimney G.



the water in each unit and containing the expandible members of a thermostatic valve controlling the steam supply to the pipe. In the general arrangement shown in Fig. 1, each radiator *g*, bath



vessel *n*, or other unit containing water, is provided with a pipe *k* supplied with steam from the boiler *a* through the mains *c*, which preferably consist of divided piping as described in Specification No. 17,750, A.D. 1905. The lavatory basins may be supplied with hot water from the neighbouring radiator *g*, as shown. In the preferred construction of thermostat, Fig. 2, which is similar to that described in Specification No. 17,339, A.D. 1906, the pipe *k* is connected by a rod *i* with the valve *h*, which regulates the supply of steam to a hand-operated valve *m* and the pipe *k*. A tube *q* is provided to prevent short-circuiting of the steam flow; or it may serve instead of the pipe *k* as the expandible member, in which case it is perforated to permit the withdrawal of condensation water through the duct *o*. For automatically adjusting the supply of steam to the pipe *k* according to the temperature of the room, the hand valve *m* may be replaced by a diaphragm-controlled valve operated by a thermostat exposed to the temperature in the room, as described in Specification No. 27,687, A.D. 1904. According to the Provisional Specification, when the invention is applied to drying or enamelling stoves, or to bakers' ovens, the water may be heated to a high temperature by sealing up the apparatus, which is fitted with a safety valve. Reference is also made in the Provisional Specification to Specification No. 12,852, A.D. 1904.

7214. Pitt, W. A. March 26, 1906, [date applied for under Patents Act, 1901]. Drawings to Specification.

Non-conducting coverings.—A steam boiler, stated to be particularly applicable to automobiles, is enclosed by a casing constructed of an outer sheet of Russian iron and an inner thicker sheet, the space between the sheets being filled with asbestos or mineral wool.

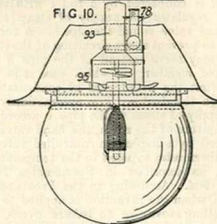
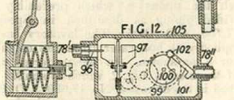
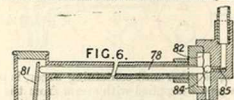
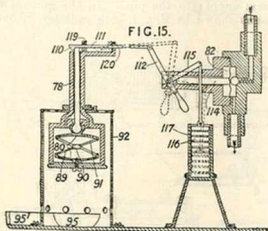
7280. Atkinson, R. E. March 26.

Heating buildings; heating water; thermostats.—In apparatus for heating water by steam for various purposes, for example for heating buildings, ships, &c., for enamelling or drying stoves, bakers' ovens, &c., or for hot-water supply to baths, lavatory basins, &c., steam is supplied to a pipe immersed in

7407. Allgemeine Electricitäts-Ges. March 30, 1906, [date applied for under Patents Act, 1901].

Heating by electricity.—Filaments of tungsten are made by squirting colloidal tungstic acid, alone or diluted with water, and heating the threads thus obtained in a reducing-atmosphere. The acid may be obtained by Graham's method.

7497. **Meissner, A., and Danischevski, J.** March 28.

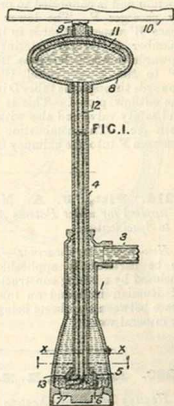


Thermostats.—A device for automatically permitting the flow of liquid fuel to the vaporizer of a lamp, when the vaporizer is sufficiently heated by the starting-frame, is operated by one or more bimetallic plates, each consisting of two plates, such as steel and brass, of different co-efficients of expansion, welded together. The curved bimetallic plates 80, Fig. 15, which straighten out when heated, may be connected together by rods 89, 91, jointed to a central piece 90, or may be arranged with their edges in contact, and may press directly, or through a lever 81, Fig. 6, on a rod 78, acting through a diaphragm 82 on a ball valve 84 in opposition to a spring 85. The thermostat chamber is placed in a casing, Fig. 10, at the side of the flue 93, and is shielded from the main burner by the starting-cup 95. In a modification, the thermostat is placed in a casing 92, Fig. 15, away from

the lamp, and the lighting-cup is connected by a passage 95¹ with a second cup 95 at the bottom of the casing, so that the alcohol in the two cups is simultaneously ignited. The rod 78, operated by the thermostat, engages a catch 110 on a rod 111 connected to a lever 112, an eccentric projection on which holds a rod 114 against the diaphragm 82. On the catch being released, a weight 116, connected to an arm 115 on the lever 112 and working loosely in a cylinder 117, turns the eccentric projection, thereby releasing the rod 114 and allowing the valve to open. A screw 119 on the rod 111 regulates the amount of engagement of the catch 110 with the rod 78, and limits the backward movement of the rod by abutting against a projection 120. In a second modification, clock-work 105, Fig. 12, is arranged between two parts 78¹, 78¹¹ of the operating-rod 78, one part 78¹ having a finger-piece 96 for engaging the vanes 97 of the clock-work, the other part 78¹¹ being normally pressed against the diaphragm 82, Fig. 6, by a projection on a lever 101, Fig. 12. When the thermostat becomes heated, the vanes are released and the clock-work revolves until the roller 102 on the lever 101 drops into a recess 100 in a cam-wheel 99, thereby releasing the part 78¹¹ and allowing the valve 84, Fig. 6, to open. The finger-piece may be detachably secured by a set-screw, so that it may be shifted by hand to start the clock-work.

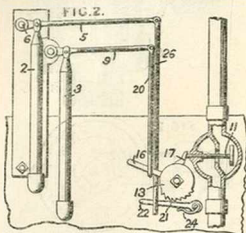
7512. **Honeywell, M. C.** March 28.

Heating by water circulation.—In an apparatus for maintaining a pressure in a hot-water circulating system by means of a mercury column, provision is made for the escape of liquid to allow for expansion. A main casing 1 is provided with a plug 7 at the bottom in which is a depression 6, and with a pipe 3 communicating with the circulating system. Extending the length of the body 1 is a pipe 4 provided at its lower end with a bell 5, which lies in the shallow basin 6. The pipe 4 communicates with the ordinary expansion vessel 10 through a separating-chamber 8 furnished with a baffle 11 and pipe 9. Mounted in the pipe 4 is a smaller pipe 12, which is bent outward at its lower end and projects at 13 through the side wall of the bell 5.



In operation, the vessel 1 is partly filled with mercury to the level X-X, the rest being then filled with circulating medium. At the normal pressure, the mercury is driven up the pipes 4, 12 into the position shown. On further expansion, the aperture 13 is uncovered and the fluid escapes up the pipe 12, projecting the column of mercury in that pipe into the chamber 8, where it separates from the fluid and falls down the pipe 4, thus keeping up a circulation until the excess pressure is relieved. In a modified form of cup 5 both pipes 4, 12 open downwardly, but the inlet of the pipe 12 is slightly higher than that of the pipe 4.

7537. Phipps, M. L. March 28.

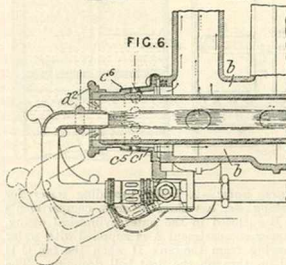
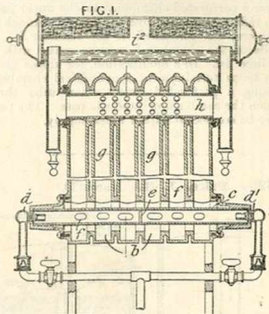


Thermostats.—Apparatus for automatically controlling the supply of feed-water to steam boilers comprises two copper tubes 2, 3 communicating with the boiler at the high and low water levels respectively and carrying at their upper ends rods 5, 9 provided to a standard 6. A valve 11, regulating the passage of steam to the feed-pump, is actuated by a toothed disk 13 having arms 16, 17, while a pivoted lever 22, pressed upwards by a spring 24, carries a pawl 21 for preventing rotation of the disk in one direction. In operation, if the level falls below the lower end of the tube 2, steam enters and causes its upward expansion, whereby, through the lever 5 and a forked rod 26 striding the arm 22, the pawl 21 is caused to engage with a tooth of the disk 13. On the level sinking below the tube 3, the tube 3 expands and so through the tube 3, rod 20, and arm 16 actuates the disk 13 to open the valve. When the level rises again, the contraction of the tube 3 tends to rotate the disk to close the valve, but this is prevented by the pawl arm 22, until the latter is depressed by the contraction of the tube 2 upon the level reaching high-water mark.

7575. Darwin, H. March 30.

Heating buildings.—Relates to the construction of gas-heated radiators of the kind in which radiating-elements are arranged above and in connexion with a chamber containing atmospheric gas burners,

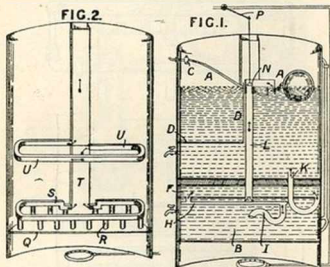
which supply hot air and the combustion products to the elements. Means are also provided for purifying the combustion products before they escape from the apparatus. A chamber *b*, which



is in communication with the atmosphere and with the loops *g*, encloses a tubular muffle *c* heated internally by burners *d, d'*. The muffle is constructed of magnesium clay or other highly refractory material, or of metal which is treated or coated with a refractory paint or surfacing. The combustion products escape through openings *f* and pass with the heated air into the loops. The openings *f* are so arranged that the induced draught tends to keep the flame out of contact with the walls of the muffle. These openings, which increase in size as they approach the centre of the tube, are also arranged in the plane of the axes of the radiator loops, so that the combustion products are prevented from coming in contact with the metal walls by the heated air. The muffle tube may be provided with a partition *e* and fitted with a burner at each end; or the partition may be dispensed with and only one burner employed. To facilitate lighting the burners, they may be hinged to the supply pipes, as shown in Fig. 6.

The burners extend through caps c^1 provided with air regulators d^2 . Atmospheric air enters the chamber b through openings c^2 regulated by a perforated sleeve c^3 . The combustion products may enter a perforated chamber h in the upper part of the radiator and pass over water and through lime, bog ore, &c. contained in the chamber i^1 . The walls of the chamber h may be coated with milk of lime &c. In a modification, the upper ends of the loops terminate in a cylindrical chamber enclosing a perforated lime-coated tube through which the combustion products pass. The purifier may be connected with a water supply.

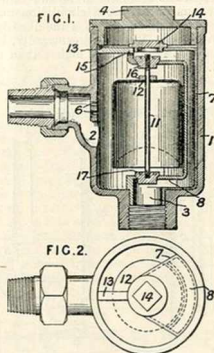
7622. Pike, J. G. March 30.



Heating water.—A boiler providing water for tea-making &c. has three separate compartments A, F, B enclosed in the outer cylindrical casing. The upper compartment A is supplied with water overflowing from the tank D when the tap C is turned on through the float ball dropping. The siphon pipe K provides a passage for the water into the middle compartment F, whence it may flow by the pipe D, the hollow metallic disk H, and the siphon pipe I into the heating-chamber B. The compartments A, F are separated from each other by a layer of non-conducting material between two metal walls. Fig. 2 shows the arrangement of the heating-apparatus separated from the compartments. The base Q of the compartment B is fitted with tubes R, through which the heated gases from the stove pass to the flue S and thence to the main flue T. A baffle in the flue T also compels the gases to pass through the tube U, which is situated in the upper compartment A. The flue T is formed by bending the outside casing of the heater to form a suitable recess and then providing a back-plate. A pipe L with a siphon end gives communication between the compartments A, B and also serves to conduct the steam and boiling water from the heated chamber B, when the water there boils violently, into the cold water in the upper chamber. The boiling

water in the tube L may also be used to regulate the gas supply by means of a valve N actuating the gas tap P.

7667. May, E. B. April 21, 1906, [date applied for under Patents Act, 1901].

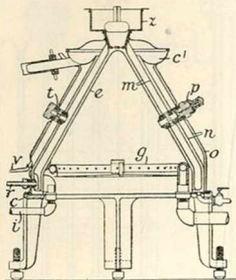


Steam traps.—The float 12, which when solid is shaped as shown by the dotted line in Fig. 1, simultaneously operates the preferably duplicate valves 16, 17 which control communication with a duct 8 in a removable structure 7 fitting fluid-tight in the outlet 3. The structure 7, which is shown in Fig. 2 segmental in form, is provided with a distance-arm 13, a screw cap 14, and, preferably, an air-escape duct 15, and after the parts have been assembled is placed in the shell 1, upon which the cap 4 is then fastened. Air or steam may pass by way of the openings 6 in the baffle-plate 2 into the shell until sufficient water has accumulated to operate the float.

7690. Pfeiff, A. T. May 12, 1906, [date applied for under Patents Act, 1901].

Heating liquids.—Relates to apparatus for heating liquids in which the heating-elements are arranged concentrically so as to form channels, which are U-shaped in vertical section, for the liquid to be heated. The heating-elements taper in an upward direction, and the inlet and outlet for the liquid are situated at the top of the apparatus. Steam is supplied by a pipe g to an inner casing e , the water of condensation escaping by the outlet pipe i , which has its inner end covered by a hood forming a water seal. Outer double casings m, n are arranged round the inner casing e , so as to form alternate steam and liquid spaces. Plug cocks p, t allow the steam to pass from the inner casing e to the interior of the casing m , and from the interior of the casing m

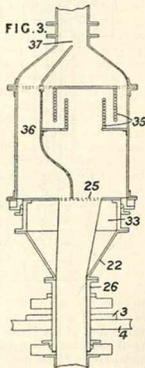
to the interior of the casing *n*. Outlets *r*, *v* for water of condensation and waste steam are also provided, the outlet *v* being fitted at its inner end with a hood forming a water seal. The liquid



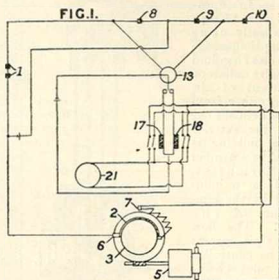
supplied from a tank *z* having a perforated bottom passes downwards between the casing *e* and the casing *m*, around the bottom of the casing *m*, and upwards between the casings *m*, *n* to the annular receiver *c'*. The plug cork *p* may be provided with a spring-controlled lift valve to prevent the formation of a vacuum in the steam spaces. An outer casing *o* may form an air space with the casing *n* to prevent loss of heat.

7691. Abell, W. S. April 2.

Heating air; heating buildings; thermostats &c.—In apparatus for heating buildings, ships, &c. by the circulation of a gas or liquid, a single automatic electrically-controlled valve divides the circulating medium into two portions. One portion passes through a heater and afterwards mixes with the other portion which is untreated. Fig. 1 shows the electric connexions controlling the motor which operates the valve. The valve and apparatus for heating are shown in Fig. 3. In a Wheatstone-bridge arrangement, the electric resistance thermometers 1, placed in the room &c. the temperature of which is to be controlled, are balanced by a resistance 2, which is



carried on a drum 3 rotated by a reversible motor 5. The resistance 2 is connected to the circuit by a brush 6 and a terminal 7. In the other arms of the bridge are adjustable resistances 8, 9, and a



resistance 10 balances the resistance of the thermometer leads. If the balance of the bridge is disturbed, the current works a reversible relay 13. The current from a battery passes through one of the electro-magnets 17, 18, which close spring switches. The current from a dynamo 21 then flows through the motor 5 and rotates the drum 3, thus increasing or diminishing the resistance 2 until the balance is restored. At the same time, a cylindrical portion 33 carrying a plate in which is cut an eccentric hole 25 is rotated, thus regulating the supply of liquid to the heating chamber 35 and to the by-pass 36. The cylindrical portion 33 is attached to a conical portion 22 which is connected to a sleeve 26 driven through a worm-wheel by the motor 5. The heated and the untreated air are afterwards mixed at the outlet 37. Contacts fitted to the drum 3 may actuate signals to indicate whether the whole or no part of the resistance 2 is included in the circuit. Signals may also be provided to indicate failure of the batteries. A scale may be attached to the drum 3 to indicate the temperature of the space affected.

7759. Carter, H. April 3.

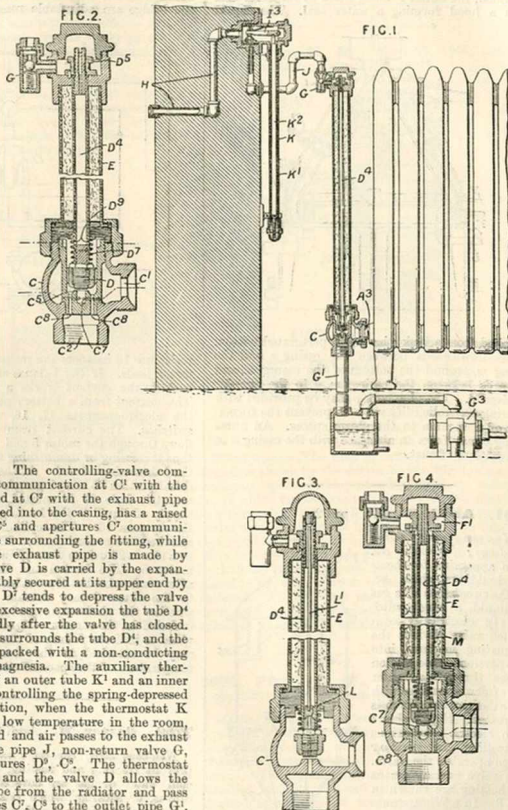
Non-conducting coverings and compositions.—To prevent freezing and rusting, pipes for conveying cold water or gas are covered with rough cloth, canvas, or sacking, which has been impregnated with a composition consisting of gas-tar, boiled oil, and resin. The pipes are preferably coated with the composition before and after the impregnated fabric is applied.

7810. Mallory, H. C. April 3.

Heating buildings; thermostats; steam trap. — In apparatus for thermostatically controlling the passage of heating-fluid through radiators, a current of air, drawn either from the apartment or from the exterior of the building, is caused to act upon the thermostat, which is uninfluenced by the temperature of the room. The flow of the air current may be controlled by a pilot thermostat exposed to the temperature of the room. As shown in Figs. 1 and 2, a stream of air is drawn from outside through the pipes H, J, and passes through the expansible tube D⁴ and pipe G¹ to the

usual exhauster G². The controlling-valve comprises a casing C in communication at C¹ with the radiator outlet A³ and at C² with the exhaust pipe G¹. A fitting, screwed into the casing, has a raised annular valve seat C³ and apertures C⁷ communicating with the space surrounding the fitting, while connexion with the exhaust pipe is made by borings C⁸. The valve D is carried by the expansible tube D⁴ adjustably secured at its upper end by a nut D⁵. A spring D⁷ tends to depress the valve and tube, but upon excessive expansion the tube D⁴ may elongate upwardly after the valve has closed. A protective tube E surrounds the tube D⁴, and the intervening space is packed with a non-conducting material, such as magnesia. The auxiliary thermostat K consists of an outer tube K¹ and an inner adjustable rod K² controlling the spring-depressed valve P. In operation, when the thermostat K contracts owing to a low temperature in the room, the valve P is opened and air passes to the exhaust main by way of the pipe J, non-return valve G, tube D⁴, and apertures D⁹, C⁸. The thermostat therefore contracts and the valve D allows the heating-fluid to escape from the radiator and pass through the apertures C⁷, C⁸ to the outlet pipe G¹.

In the form shown in Fig. 3, which may be employed without the pilot thermostat, a valve L is carried by a rod L¹ of small expansibility and prevents the flow of air through, and the entry of steam into, the tube D⁴ when this tube contracts. In another construction, Fig. 4, applicable chiefly to steam heating systems, an additional tube M surrounds the thermostatic tube and opens at the



top into, the casing F¹. The flow of air through the tube M and the thermostatic tube causes the contraction of the latter and the consequent opening of the controlling-valve to allow the water of condensation to escape. Upon steam also escaping, the increased temperature produces expansion and the closure of the valve.