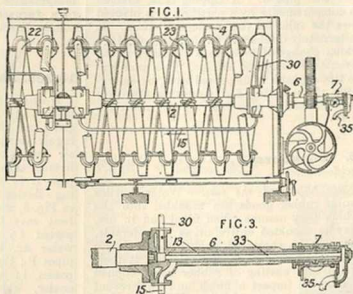
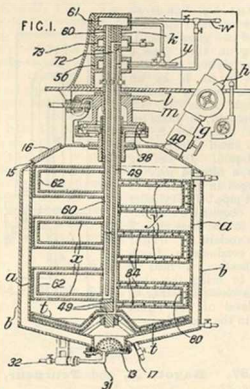


helices, to which the mixing-paddles 4 are attached. The shaft 2 has, at one end, a hollow shaft 6 on which a steam or water distributing box 7 is fitted, which is provided with inlet pipes for the steam and the cooling-liquid respectively, and with an exhaust pipe 35. The heating or cooling fluid passes along an annular space 13 in the pipe 6, and thence through a pipe 15 to the coils, the fluid finally returning through the pipe 30 and an inner passage 33 to the exhaust or outlet pipe 35. In the case of long troughs, two helices 22, 23 are preferably used, their respective shafts 2 being connected by a hollow shaft through which the fluid circulates. In this arrangement, the fluid is first caused to circulate through the coil 22 and then through the coil 23.



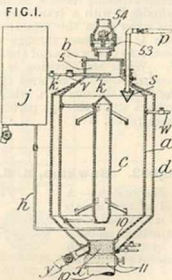
**18,741. Haddan, R., [Edson, E. R.].**  
Aug. 26.



*Digesters.* — Relates to apparatus for treating fish waste and other material with the use of a volatile solvent for the extraction of oil and the production of fertilizer. The casing *a* surrounded by a jacket *b* is provided with a charging-opening 15 closed by a cover 16, also with an outlet 17 closed by a door 13 carrying a strainer, and with an oil pipe 31 coupled to the pipe 32. The shaft *k* carries a frame and turntable *m* running upon

ball bearings 38, 40, and formed with a bevel-wheel *l* driven by another bevel-wheel. A series of tubular, unperforated, stirring and heating arms and connecting-arms 62 communicate through a passage 60 in the shaft *k* with the chamber 61 and through the passage 72 with the chamber 73, and a series of perforated tubular stirring and vapour &c. supplying arms 84 and connecting-arms 80 and also the two bottom arms *t* communicate through the passage 49 with the chamber 50. Steam or hot air is supplied through the pipe *u*, and compressed air through the pipe *w*. The pipes *x*, *v*, *t*, 62, 80 form wedge-shaped blades with the edges in the direction in which they move. After the extraction of the oil, the material is dried by the passage of compressed air, and all vapours are drawn off through the pipe *g* provided with a pump *h*.

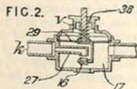
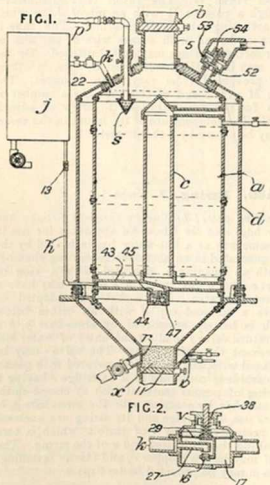
**18,742. Haddan, R., [Edson, E. R.]**  
Aug. 26.



*Digesters.* — Relates to a process and apparatus for the treatment of fish-waste, garbage, &c. for the extraction of oil and glycerine. The receptacle *a*, Fig. 1, heated by the jacket *d* and internal communicating chamber *c*, is provided with a charging opening 5 closed by a cover *b*,

and with an outlet 10 closed by a slide 11. Compressed air from the chamber *j* is admitted to the top of the receptacle through the pipe *k*, and, when required to disintegrate the matter under treatment, it is also admitted through the lower pipe *h*. When the air pressure becomes too great, the relief valve 53 is raised against the action of the adjustable spring 54. The valve *v* in the pipe *k* comprises an air-supply pipe 27, Fig. 2, adapted to be closed by the plug 16 when the air pressure in the chamber 17 is sufficient to raise the diaphragm 29 against the action of the spring 37 of which the pressure is adjusted by the screw cap 35. Water may be admitted through the pipe *w*, Fig. 1. The oil is drawn off through the strainer *s* and pipe *p*. The solution of gelatine flows through the filtering-material *x* to the pipe *y*. The residue and the filtering-material are discharged through the pipe 10 on withdrawing the slide 11.

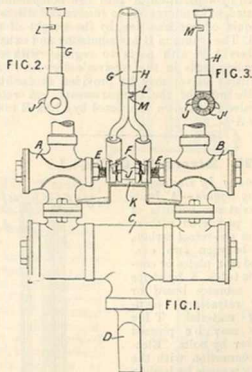
18,743. Haddan, R., [Edison, E. R.], Aug. 26.



*Digesters.*—Relates to apparatus for treating fish-waste, garbage, &c. for the production of oil,

grease, or gelatine. The receptacle *a*, Fig. 1, surrounded by a jacket *d* which communicates with the interior heating vessel *c*, is provided with charging and discharging pipes 5, 10 closed by slides *b*, 11. Compressed air from the chamber *j* is admitted to the top through the pipe *k*, and, when required to disintegrate the matter under treatment, through the pipes *h*, 43 to the perforated chamber 44 at the bottom. When the valve 13 is closed, any back pressure in the chamber 44 closes the valve 47 against the action of the spring 45. The valve *v* in the pipe *k* comprises an inlet pipe 27, Fig. 2, adapted to be closed by the block 16, when the pressure in the chamber 17 is sufficient to raise the diaphragm 29 against the action of the spring 38. When the pressure in the receptacle *a*, Fig. 1, reaches a certain limit, the valve 53 is raised against the action of the spring 52 which is regulated by the screw cap 54. Oil is drawn off through the strainer *s* and pipe *p*. The solution of gelatine passes through the filtering-material *x* to the pipe *r*. The residue and the material are discharged through the pipe 10 on withdrawing the slide 11.

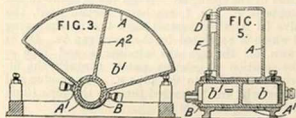
19,020. Stott, J. Aug. 29.



*Heating water.*—The handles of the water and steam cocks of a geyser or other apparatus, are locked together so that the steam or gas cannot be turned on without previously turning on the cold water. Fig. 1 shows a cold-water valve A and a steam, hot water, or gas valve B bolted to a plate or to a mixing chamber C, which opens into the bath by a nozzle D. A projection L, Figs. 1 and 2, is formed on the handle G of the water tap, and is received by a recess M, Figs. 1 and 3, in the under surface of the handle H of

the steam or gas cock. The handles can thus be operated separately, but the handle H cannot advance further than the handle G. Either valve can be given a lead in order to adjust the temperature of the heated water. For this purpose, the bosses of the handles have serrated faces J', Fig. 3, which engage with rings F, Fig. 1, secured on the valve-spindles E. The motion of the handles is limited by stops J, Figs. 1 and 3, which come in contact with the bridge K of the casing.

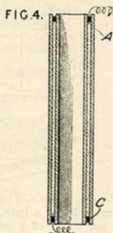
19,033. Ranoe, J. P. Aug. 29.



*Steam traps.*—A trap for use with steam engines &c. has a receiver A, preferably of the form shown, divided by a partition A<sup>2</sup> into two compartments oscillated, so as alternately to receive and discharge the liquid of condensation, by the weight of this liquid. The trunnion B has admission and exhaust chambers b, b' with ports to register with corresponding ports in the receiver's sleeve A'. Air or snifting valves may be provided to facilitate the discharge of the compartments. A rotary disc valve D is shown, connected by a link E to the sleeve A'.

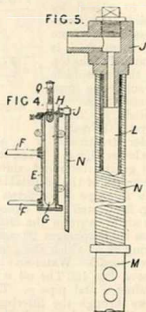
19,128. Rivers, E. G. Sept. 1.

*Heating by electricity; heating liquids.*—A heating-resistance consists of finely powdered carbon, such as gas-retort carbon, held between two enamelled iron plates or concentric tubes A by strips C of asbestos board or other refractory insulating material. The plates may be pressed together by bolts. Electric connection with the carbon is made by leading copper conductors into it; the carbon may be divided by insulating-strips to lengthen the path of the current. A number of the resistances may be connected in series or parallel, and used as a radiator or for heating liquids.



19,131. Royle, J. J. Sept. 1.

*Thermostats.*—In place of a diaphragm in pressure-actuated apparatus, an india rubber tube is employed, bound round with wire, wire rings, cord, or the like to prevent it from increasing in diameter. The elongation or contraction due to variations in the pressure of the contained fluid is used to operate a furnace damper or the like. Figs. 4 and 5 show an apparatus for controlling the flue damper or the air-inlet valve of a



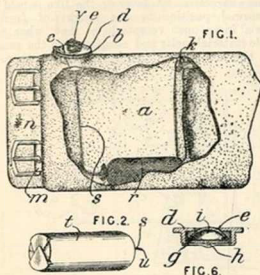
hot-water circulating-boiler. The flow and return pipes of the heating-system are connected by pipes F, with a vessel E, containing an inner copper vessel G. The vessel G communicates through a passage H with an elbow J, to which the actuating-tube L is attached. The tube is shown as bound with square wire N, but wire of other section or rings may be substituted. Or the tube may be braided with cord or wire, or otherwise prevented from varying in diameter. The piece M at the end of the tube has a number of holes for the connecting-pin to allow of adjustment. The temperature of the liquid in the vessel G may be shown by a thermometer Q.

19,189. Ewing, J. Sept. 1.

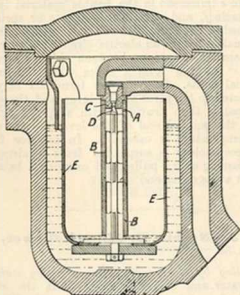
*Heating gases; heating by chemical action; hot-water bags and the like.*—An apparatus for use in the same way as a hot-water bag is heated by the heat generated in an acetylene-generating chamber a with an opening b, provided with a ring or socket c, and a gas aperture k which may have a non-return valve. The socket c is adapted to receive a screwed cap d with an orifice below which is loosely supported by cross-bars g, h a non-return valve i to allow the entry of water and to prevent the exit of gas. The valve i may be dispensed with, and the orifice e covered with gauze. The carbide is contained in a cartridge r having a covering of porous material such as cheese cloth, and attached by a string s to the cross-bars g, h. Before use, a cartridge and its string are enclosed in a protective casing t of tinfoil, which is torn by pulling the projecting end u of the string. The cap d may have a stopper v, and elastic fastenings n may be provided under flaps n.

(For Figures see next page.)

19,189.



19,218. Foole, W. J. Sept. 2.

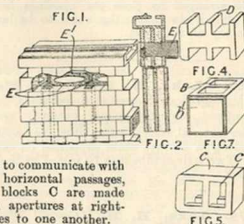


*Steam traps.*—In a steam trap, having an inverted bell-float E carrying a central valve spindle guided by a pipe B dipping from the steam outlet, an aperture A is provided to admit steam to the space about the valve D and its seat C. The invention may be applied to the traps described in Specifications Nos. 5938 and 11,801, A.D. 1901, and having means to cause the valve to grind on its seat after closing. In applying the invention to a trap of the kind described in Specification No. 17,281, A.D. 1902, an opening is formed through the main discharge pipe and the inner tube.

19,352. Morrison, L. A. Sept. 3.

*Heating buildings &c.*—Fireproof walls are constructed of cement or like hollow blocks B, C, D which are laid with cement to form continuous

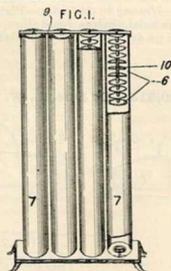
conduits or flues for water pipes, electric wires, heating, ventilating, &c. To enable the vertical



flues to communicate with the horizontal passages, the blocks C are made with apertures at right-angles to one another.

19,471. Bayles, A. G., and Untermann, J. Sept. 5.

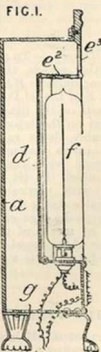
*Heating buildings, radiators for.* From a bar 9, fixed across the radiator tubes 7, depend rods 10, on each of which a number of baffle-plates 6 with serrated edges are mounted at intervals.



19,522. Veritys, Ltd., and Ebbutt, F. G. Sept. 6.

*Heating water; heating by electricity.*

—In an electric stove for warming a room, several incandescent lamps *f* are supported in front of a silvered metal reflector *d*, below a perforated plate *e*<sup>1</sup>, through which hot air can pass to openings in a front plate *e*<sup>2</sup>. An air channel is enclosed by back, top, and side plates behind the reflector, so that air entering bottom openings *g* may be warmed and pass out through the openings in the front plate *e*<sup>2</sup>. The top plate may be



provided with an opening and lid, and a shutter may be arranged to close the openings in the front plate  $e^2$ , to enable the water to be heated on the top of the stove.

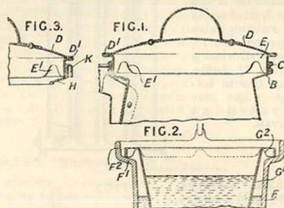
**19,569. Lake, H. H.,** [General Electric Co.]. Sept. 6. Drawings to Specification.

*Heating by electricity.*—Rough tubes of refractory material, such as fused silica, are smoothed by heating in an arc, while supported on carbon rods. Two ends of tube may be joined by heating in an arc.

**19,574. Lake, H. H.,** [General Electric Co.]. Sept. 6. Drawings to Specification.

*Heating by electricity.*—Plates made of refractory material, such as fused silica, are joined by heating in an arc, deflected by an electromagnet.

**20,313. Le Duc, E. W.** Sept. 17.

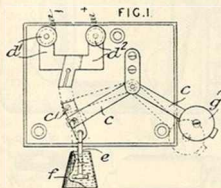


*Boiling-pans.*—To prevent boiling over in kettles and other vessels, the vessel is provided with a flange or shoulder B having a vertical wall C. The flange E of the lid D is scalloped, as shown at  $E^1$ , and rests on the flange B. The shoulder  $D^1$  does not rest on the top of the wall C. The flange B preferably slopes inwardly, so that any liquid which passes through the scallops  $E^1$  returns to the vessel, while the steam escapes. The flange upon which the lid rests may be fitted inside a vessel with vertical walls. Fig. 3 shows a detachable flange H having a bent-over flange K to engage the edge of the vessel. It may also be fitted by means of a vertical rim engaging the interior of the vessel. Fig. 2 shows the application of the invention to a double vessel.

**20,931. Venner, R. F. S.** Sept. 25.

*Thermostats.*—Relates to means for automatically operating a damper, water tap, air valve, or other controlling-device when the temperature

becomes excessive. A lever or the like is held in its normal position by the weight of fusible material in an open receptacle, so that, when the fusible material melts and escapes from the receptacle, the lever closes an electric circuit, thereby



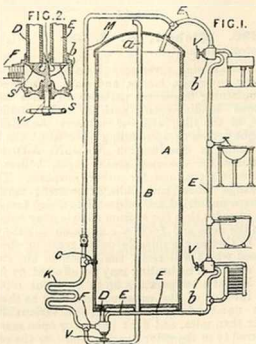
operating the controlling-device. In one form, an open receptacle  $f$  is suspended from one arm of a pivoted cranked lever  $c$  by a T-shaped or serrated eye-pin  $e$  immersed in the fusible material in the receptacle  $f$ , and a balance-weight  $g$  or spring is attached to the other arm of the lever  $c$ . The two terminals  $d^1$ ,  $d^2$  of an electric circuit are provided with spring extensions, between which a contact-piece  $c^1$  on the lever  $c$  slides when the fusible material melts. One of the terminals may be connected to the pivot of the lever, and the other terminal is then provided with a spring against which the pointed end of the lever  $c$  bears when the temperature is excessive. In another form, the receptacle  $f$  is suspended from a string or wire passing over a pulley and carrying a balance-weight at its other end.

**21,273. Nesbit, D. M., and Clowes, W.** Sept. 30.

*Heating by steam circulation; heating water.*—The water and steam escaping from the steam traps  $b$  of a steam heating-system or the like are collected and used as feedwater for steam generators and other purposes. The steam-trap discharge-pipes  $a$  lead to a main collecting-pipe  $c$  connected to the inlet of a condenser  $d^1$ , preferably a combined feedwater heater and condensing apparatus of the kind described in Specification No. 21,020, A.D. 1897. The water in the collecting-pipe  $c$  passes by a bye-pass  $e$ , through a straining-box  $f$ , to the lower collecting or settling chamber of the condensing-apparatus. The steam passes through a number of  $\cap$  or other tubes, surrounded by the water to be heated, and thence passes to a condensing-spray of water in a chamber connected to the collecting-chamber. The spray is fed preferably with water from the jacket surrounding the cooling and condensing pipes. When the water level has risen sufficiently, a float valve, controlling the passage to the feed-pumps, is opened, while the supply to the sprayer is cut off by another float valve. A vapour pipe  $r$  open to the atmosphere may have an inlet  $s$  for boiler fluid.



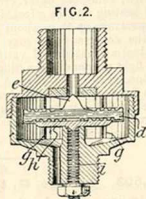
reservoir A is connected with the hot-water back K by the pipe C and by the pipes D, F. The distributing-pipe E for sinks, baths, radiators, &c. is connected with the upper part of the boiler and



with the casing *b* of the distributing-valve V, and also with the back K by the pipe M. There are two water-heating circuits in the arrangement, and the pipe M provides means for preventing thumping and bubbling of the water in the boiler due to superheating. The cold-water supply pipe B is led through the boiler, and has an aperture *a* near the top of the boiler to prevent drawing-off of water by a siphon action when the supply is shut off. The fluid-controlling valve V, Fig. 2, is arranged to operate in connection with the ports for the pipes D, E, and is adapted to open one port fully and close the other, or to close one to the same extent that it opens the other, by means of the discs S, S', the ports being arranged on one side of a diametral line of the casing *b*. The valve V is applicable as a radiator valve.

**21,571. Still, W. M.** Oct. 3.

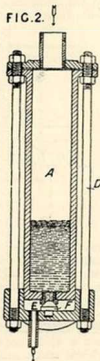
*Steam traps.*—A n expansible liquid, such as alcohol, is enclosed in a vessel *d*, made, preferably, with corrugated walls and carried by a disc *h* on an adjustable screw *i*. The top of the chamber *d* is fitted with a conical plug *e*, which, when the liquid expands, closes the inlet to the trap. Ribs *g* serve as guides to the



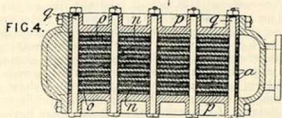
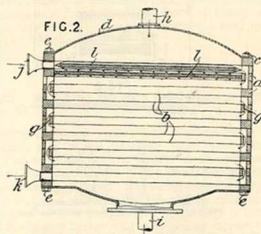
chamber *d*. The arrangement may be inverted, to act upon and close the outlet.

**21,673. Simpkin, F. H.** Oct. 6.

*Steam traps.*—The condensed steam collects in a cylinder A having an outlet E which is closed by a valve F carried by a cross head connected by side rods D to the flanges on the upper end of the cylinder. The valve is opened and closed automatically by the expansion and contraction of the cylinder A.



**21,701. Allen, R.** Oct. 6.



*Heating liquids and gases.*—Apparatus for heating and cooling liquids and gases generally, and applicable also as a condenser and feedwater or air heater for a steam engine, is composed of a number of thin flat or corrugated plates *b*, Fig. 2, disposed

one above the other and separated by frames *a* which form distance-pieces. Suitable packing is placed between the edges of the plates and the frames, and the whole is closed by end covers *d* and secured together by means of bolts *e*. The spaces between the plates are connected together alternately, to form two distinct continuous passages through the apparatus, by means of ports *g* in the frames *a*. Preferably, these ports are arranged so that the liquids or gases can pass through the adjacent passages in a direction at right-angles to each other. Inlet and outlet connections to the separate passages are shown at *h*, *i*, *j*, *k*, and filling-plates *l*, with bevelled ends, are placed between the plates to divide the currents passing through the spaces and force them into contact with the heating or cooling surfaces. In one modification, Fig. 4, the plates *a* are separated by solid bars or distance-pieces *n* and by perforated supports *o*, which also serve to prevent distortion of the plates. The plates are enclosed in a cast-iron casing *p*, and the whole is secured together by bolts *q*. Webs are provided on the inside of the end covers of the casing to make the liquids or gases pass in a sinuous course. In a second modification, the tiers of plates or distance-pieces are cast in one piece and enclosed in a casing, as before. When employed as a condenser and feedwater or air heater for a steam engine, the exhaust steam is passed through one set of alternate spaces, and the air or water, or both, circulated at right-angles to it through the other spaces. The invention is also applicable for warming buildings by passing steam and air through the two sets of spaces.

**21,744. Cohen, M. I.** Oct. 4, A.D. 1901,  
[date applied for under Patents Act, A.D. 1901].

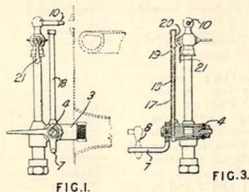
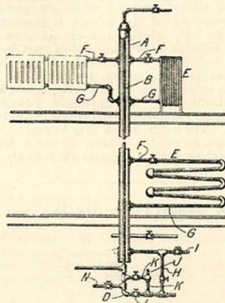


FIG. 1.

FIG. 3.

*Heating water.*—The gas cock 4 in the supply pipe 3 of gas burners, more particularly applicable to instantaneous water heaters, is normally locked in its closed position by a rod 17 which drops by gravity into recesses in the casing and the plug. The rod slides in a vertical guide-tube 18 and has a horizontal extension 19 projecting through a slot 20 into the path of an arm 21 which revolves with the thumb-operated cock of the pilot burner 10, so that the main cock 4 cannot be opened before the pilot cock. A horizontal arm 7 carried by the cock 4 engages the water valve operating-lever 8.

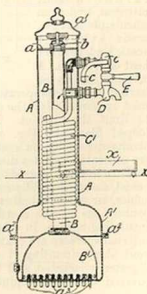
**21,784. Donnelly, J. A.** Oct. 7.



*Heating buildings &c.*—A hot-water heating-system for buildings consists of the water pipe or tube *A* extending from floor to floor and constituting the hot-water main, the circulating systems or radiators *E* communicating with the main *A* by the branches *F*, *G*, and the steam heating-pipe *B* extending longitudinally through the hot-water main *A* to heat the water therein. The water-feed pipe *I* is connected with the return-conduction pipe *D* by the valved discharge pipe *H*, and the return pipe is provided with the valve *L* and the air vent *N*. An automatic or thermostatic valve *J* may be employed in the return pipe and may be arranged in the valved by-pass *K* leading round the valve *L*, so that the automatic valve may be introduced or cut out as desired. The return pipe *D* may be connected with a vacuum pump or exhauster.

**22,085. Boulting,**  
**J.** Oct. 10.

*Heating water.*—Relates to apparatus for use in refreshment bars and the like, from which water can only be drawn off when in the boiling condition. Cold water is supplied to the apparatus by an inlet pipe *c* and cock *C*, fitted to the upper part of the outer column. The water passes through a spiral tube *C'*, into the boiler *A'*, through holes in the baffle *B'*, and up the inner tube *B*, and is delivered through the cock *D*.





The cocks C, D are operated by a common handle E. The tubular column A is enclosed at the top by an outer cap  $a^1$ , which is movable, and an inner plate  $a$ , both of which are perforated. The lower end of the column is connected to the boiler A', which is made in two parts jointed together at  $a^2$ , the bottom part being in contact with the source of heat. Copper studs  $a^3$  are fitted to the bottom, projecting by equal amounts on each side, the object being to transmit the heat efficiently. The upper end of the tube B is attached to the plate  $a$ , and closed by the safety-valve  $b$ . The boiler, which may be heated by gas, is arranged below the counter X, and a tray  $x$  is fitted to the column A, beneath the cock D.

22,233. Mare, F. de. Oct. 13.

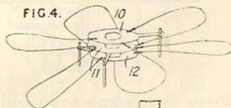
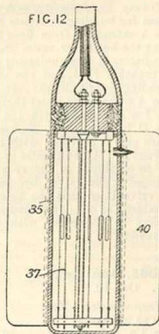


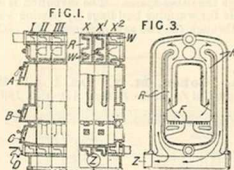
FIG. 12

*Heating by electricity; heating liquids; digesters.*—Cooking-vessels or other apparatus are heated by electric resistances of carbon or metal, which are supported in blackened metal, black or dark red glass, or other casings, containing a gas or vapour such as ammonia, carbon dioxide, nitrogen, hydrogen silicide, olefiant gas, acetic ether, or acetic acid, to allow heat convection. A metallic resistance having a large temperature-resistance coefficient is used in series with the carbon heating-resistances, to limit the current. The resistances may be looped filaments, Fig. 4, several of which are arranged radially on metal discs 10, 11, 12, which are separated by mica discs; these can be placed in recesses in the underside of a digester or cooking-vessel, and enclosed by a metal plate, attached with solder, or with asbestos and red lead. Electric connections to the metal discs are passed through insulating-bushes in the enclosing plate. The internal surfaces are coated with red lead, to prevent short-circuiting if a filament breaks. The digester is jacketed, and the enclosing plate is also covered with non-conducting material, to reduce

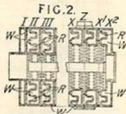


loss of heat. The lid of the digester may also contain heating-resistances, and may be used separately as a hot-plate; in this case, a safety-valve is placed on one side of the digester itself. Straight resistant filaments 37, Fig. 12, may also be employed, carried by nickel wires at their ends, each filament being, however, made with a small loop at the middle, to permit of contraction; such filaments may be used in the base of a rectangular digester, or in a cylindrical heater 35, provided with radial metal plates 40, for immersion in a liquid to be heated. Carbon resistances may otherwise be made on the surface of porous or non-porous porcelain, or enamelled metal. In one method, the surface is painted with a mixture of carbon and tar, gum, sugar, dextrin, glucose, gelatine, albumen, or other material, which is afterwards carbonized by heating. In another method, a fine nickel wire is embedded in an enamelled surface, or a metal such as gold or platinum is deposited thereon, and is then heated electrically in a liquid or gaseous hydrocarbon, from which carbon deposits on the surface about the metal. This process may be used to thicken carbon coatings made by the painting method. The coatings may be covered with soluble glass or enamel, which is then fused on them.

22,263. Ruef, J. Oct. 13.

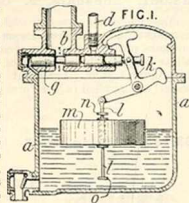


*Heating water, boilers for.* A sectional boiler for heating water for water-circulating heating-systems is shown in sectional elevation and plan views in Figs. 1 and 2 and in elevation in Fig. 3. The boiler is composed of a number of members I, I', X, X', X''. The member I contains the feed-door A, the furnace door B, the ashpit door C, and the outlet cock D. The smoke-flues R branch off from the bottom part of the space F, and the gases pass round and downwards to the base of the boiler and to the chimney Z, as shown by the arrows in Fig. 3. The water spaces W jacket the smoke-flues. The grate is fixed and formed by bracket-shaped lugs, which have hollow spaces connected with the water space of the boiler so that the grate is water-cooled.



**22,516. Day, C. G.** Oct. 16.

*Steam traps.*—The vessel is be drained is connected to the inlet *b* of the trap casing *a*, and the inlet *d* is connected to a steam supply or is open to the atmosphere. The inlets *b*, *d* are governed by the piston valve *g*, which, in turn, is controlled by the float *m* and associated mechanism.

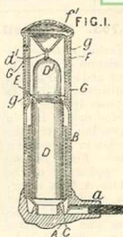


The rod *l* having upper and lower stops *n*, *o* for the float is connected to the pivoted lever *k*, which is connected to the piston-rod stem.

**22,559. Leuthesser, F. W.** Oct. 16.

*Heating buildings &c., radiators for.* Relates to air valves for radiators, and more particularly to means for preventing the sparking out

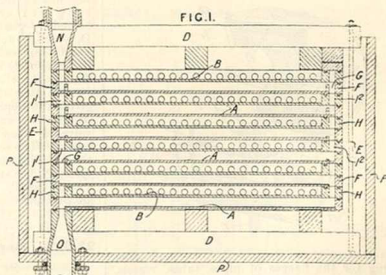
of the water of condensation through the vent for the air. The air vent is controlled by the valve stem *d*<sup>1</sup> carried and actuated by the float *D*, *D*<sup>1</sup>. The float is open at the bottom, and is provided with a guiding or centering ring *E*. The external wall *B* and the internal wall or shell *C* are fixed to the base or cup *A*, by which the nipple or stem *a* of the valve is attached to the radiator. The protecting cap or cover *F* surrounds the upper part of the valve casing, and is spaced therefrom to form a chamber



for the reception of the water of condensation, the water being evaporated or vaporized in this chamber. The cap has a closed top and escape openings leading from the chamber *G*. The body of the cap *F* and its top *f*<sup>1</sup> may be in separate pieces, the top fitting inside or outside the body. Indentations *g* are provided, and the cap is brazed or otherwise fixed to the casing to prevent leakage.

**22,571. Guttman, O.** Oct. 16.

*Heating liquids and gases.*—Relates to heat-exchanging apparatus or apparatus for condensing gases and vapours by cooling, for vaporizing liquids by heating, or for attemping liquids and gases. The apparatus is constructed from the plates *A*, *B* arranged to form two separate series of zig-zag channels, one series being for the circulation of the liquid or gas being heated or cooled and the other series for the fluid to be condensed, vaporized, or attemped. The plates *A*, *B* are secured together by bolts or screws *E*, and each plate *A* or *B* is flat or corrugated and has a raised rim *F* or *H*. The receiving-plates *A* are provided with perforated partitions or projections for the purpose of uniformly dividing the streams of liquid and for maintaining a definite level of liquid on the working-surface of the plate. One slot *G* is provided in the plate *A*, while two slots *I*, *I*<sup>1</sup> extend across the covering-plate *B*. Suitable tongue-and-groove joints or ground-surface joints are provided between the plates and

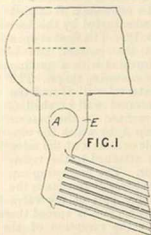


rims or other parts. Inlet and outlet pipes *N*, *O* are provided, and are held in place by means of the joints *G* or by separate screws or bolts. The whole apparatus may be placed in a suitable surrounding vessel *P*, which contains the condensing, vaporizing, or attemping medium.

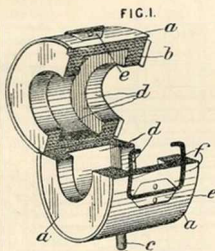
**22,763. Campbell, J. M.** Oct. 20.

*Heating water.*—The circulation of water in steam and other boilers is utilized for motive purposes by placing a turbine or the like in a position where the circulation is concentrated. Fig. 1 shows the application of the turbine A to a water-tube boiler between the steam- and -water drum and the water tubes. Similarly, in the case of cylindrical boilers, the turbine is mounted in the connection of the boiler with an upper drum.

In each case, the motive power is produced without loss of heat, owing to the water-space E in which the turbine is placed being surrounded by the furnace flues.



**22,976. Barratt, S. H. H., and United Asbestos Co.** Oct. 22.

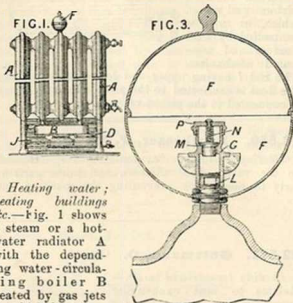


*Non-conducting coverings.*—A non-conducting covering for the flanges of pipes, tubes, vessels, and the like is shown in Fig. 1. The protective metallic removable cover *a* is constructed with a non-conducting lining of corrugated asbestos paper, or millboard *b*, the inside surfaces of which are also protected by waterproofing with varnish or coating with a suitable material or by a metallic lining *d*. The cover fastening consists of U-shaped staples *f*, the ends of the staples being slid from each side into the horizontal sockets *e* fastened on the upper and lower halves of the covering. A drip pipe *c* for the cover is provided.

**23,061. Lonsdale, T.** Oct. 23.

*Non-conducting coverings and compositions.*—The composition, for lagging steam boilers, pipes, &c. contains pulverized cork, magnesia powder, French white clay, finely-cut asbestos, hair mixture, and kieselguhr. The ingredients are mixed with water, and applied in the form of a paste.

**23,163. Fenlon, H. T.** Oct. 23.

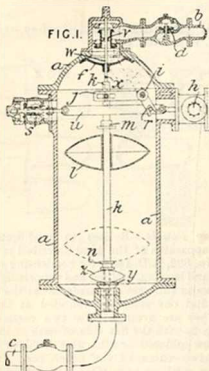


*Heating water ; heating buildings &c.*—Fig. 1 shows a steam or a hot-water radiator A with the depending water-circulating boiler B heated by gas jets D, which, however, may be replaced by oil burners, or by means for heating by electricity. The radiator is of an ordinary type. When gas jets are used, a copper reflector J is provided for giving the appearance of a fire. Fig. 3 shows in section the appearance of a fire. Fig. 3 shows in section the water-feeding cup F with a safety-valve M when the apparatus is used as a steam heater. The seating G of the valve is secured to the socket I, the valve M being kept down by a spring N, the strength of which is adjustable by a screw cap P. The usual draw-off and air taps are provided.

**23,299. Barker, A. H.** Oct. 27.

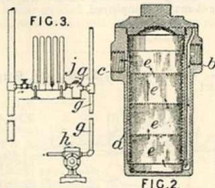
*Heating water ; heating buildings &c.*—In apparatus for heating and circulating water for heating buildings and rooms, or for the supply of hot water, the equilibrium water supply-valve *v*, the high-pressure steam valve *s*, and the low-pressure steam valve are operated by a float *l* in a closed vessel *a*. Water from the return pipe *b*, having a check valve *d*, is sprayed by a rose *f* into the vessel *a*, where it is heated by low-pressure steam admitted at *h*. As the water accumulates, it raises the float *l* until it engages a collar *m* on a rod *k*, which is connected, by a pin and slot, to a lever *j* on a weighted spindle *i* carrying a fork *r* engaging a pin on a rod *u* connected to the steam valves. The water-valve spindle *w* engages a recess in the rod *k*, which engages pins *x* to close

the valve. The water and low-pressure steam valves being closed and the high-pressure steam valve opened, an outlet valve *y*, having a float *z*, is also allowed to open, and the hot water is



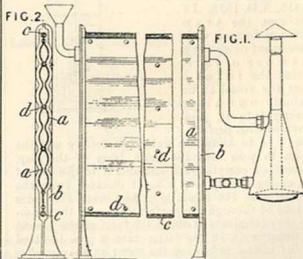
forced past a check valve in the outlet pipe *c*. When the float *l* descends, it acts on a collar *u*, so as to move the valves back to the initial position. The supply of the low-pressure steam may be controlled by a thermostat exposed to the temperature of the water in the return pipe *b*. In a modification, a single throttle screw-down steam valve is used, the screw engaging a nut fixed to the valve-box cover and the spindle carrying a lever connected to the rod *k*. In this case, the supply of low-pressure steam is obtained by throttling the high-pressure steam. Inversely, the supply of high-pressure steam may be dispensed with by employing a steam pump worked by the low-pressure steam to remove the water. In this case, the high-pressure steam valve may be replaced by the steam-supply valve of the steam pump, the water piston of which is suitably reduced in diameter. Two floats may be used, the lower one being connected to the upper one, its spindle, or lever, by a chain or other flexible connection. In this case, the upper float acts by its buoyancy, when the water is at the higher level, to cut-off the low-pressure steam supply and the water supply, and the lower float acts by its weight, when the water is at the lower level, to shut off the high-pressure steam supply. This arrangement is described in the Provisional Specification. A tank of greater capacity than the vessel *a* may be used to receive the excess of water or provide a sufficient head to feed the boiler automatically.

23,530. Piatt, R. F. Oct. 28.



*Heating buildings.*—The outlet of a radiator *j*, Fig. 3, is provided with a steam-condensing chamber *a*, Fig. 2, having the inlet *b* connected to the radiator and the outlet *c* connected with the return pipe *g*, in which a partial vacuum is maintained by the exhaustor *h*. The inlet communicates with the bottom of the water-seal chamber *a* by the narrow passage. Baffles *e* are arranged in the vessel *a*, and these baffles are preferably perforated diaphragms arranged at intervals in a cylinder of wire cloth.

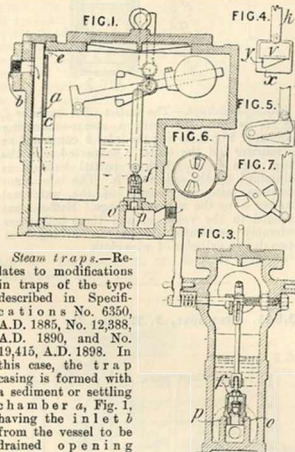
23,841. Bennett, J. E. Oct. 31.



*Heating buildings &c.*—A portable heating or cooling apparatus for rooms, offices, conservatories, and the like is shown in Figs. 1 and 2. The apparatus is constructed of the corrugated metal sheets *a* so secured together by the rivets *d* and the slit tubes *c* and to the standards *b* by soldering &c. as to form, in effect, a hot or cold wall with corrugated faces. The plates may be arranged with their corrugations in opposite or parallel relation, and may be distanced apart to leave a clear space between them from end to end and top to bottom, or to form to-and-fro channels for the circulation

of the medium. A gas or oil boiler, a steam boiler, or an air heater may be used for heating, and, for cooling fermenting rooms &c., brine or other agent may be employed.

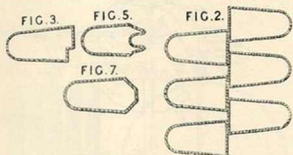
**23,854. McDougall, I. S., and Sugden,**  
T. Oct. 31.



*Steam traps.*—Relates to modifications in traps of the type described in Specifications No. 6350, A.D. 1885, No. 12,388, A.D. 1890, and No. 19,415, A.D. 1898. In this case, the trap casing is formed with a sediment or settling chamber *a*, Fig. 1, having the inlet *b* from the vessel to be drained opening directly into it, and provided with perforations *c*, *e* to allow the water to overflow and the steam to pass into the main body of the trap. Instead of carrying the chamber *a* to the top of the casing, it may stop a short distance from the top, so that the steam can pass over the sides instead of through the perforations *c*, or the chamber may terminate at about the level of the lowest perforation *c*. In the latter case, a pipe is fitted to the inlet *b* to convey the water in the chamber *a*. The seat of the equilibrium discharge valve *f* is made of a metal having the same coefficient of expansion as the valve, and is provided with a tubular extension *o*, Figs. 1 and 3, which is screwed into a hole *p* in the valve casing. Suitable passages are provided for the flow of water. Four forms of slide valve to take the place of the equilibrium valve are described and shown in Figs. 4, 5, 6, and 7. In Fig. 4, the valve *v* is shown pivoted to the end of the rod *k*, and sliding over a seat *x* provided with a discharge port *y*. This port is so formed that the valve, in lifting, will uncover it gradually at first. Fig. 5 shows the valve pivoted at one end

to the rod *k* and at the other to the seat. In Fig. 6, a hit-and-miss arrangement is adopted. A similar arrangement is shown in Fig. 7.

**23,985. Robinson, P.,** [trading as Morton & Co., R.]. Nov. 3.

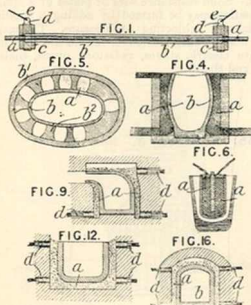


*Heating liquids.*—Relates to modifications in tubular apparatus of the kind described in Specification No. 802, A.D. 1882, for condensing steam or vapour, and heating, cooling, and vaporizing liquids. The tubes in this case are made flat at the top and bottom and one side, and rounded at the other side. They are arranged into two vertical rows, as in Fig. 2, with the flat side of each of the tubes in one row soldered or otherwise fixed to the flat side of two tubes in the other row. In this manner, a continuous surface is provided for the liquid to flow downwards from the outside of one tube to the outside of the next. The flat sides of the tubes may be modified as shown in Figs. 3, 5, and 7, to facilitate holding them in their proper positions while the joint is being soldered.

**24,235. Bronn, I. J.** Nov. 5.

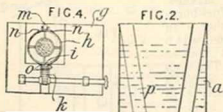
*Heating by electricity.*—Conductors of carbon or other material of sufficiently high resistance are enclosed in refractory and non-conducting sheaths or tubes and employed for heating purposes. Fig. 1 shows a carbon rod *a* enclosed in a porcelain tube *b*, the current being supplied through the conductors *c*, annular clips *d*, and carbon collars *e*. Several such conductors coupled in parallel or series may be employed in heating, say a glass furnace, the porcelain tube preventing contact between the glass and the carbon conductor. Casings filled with pounded, flaky, or granular carbon (coke, charcoal, or graphite) may also be used. The metallic conductors to the furnace &c. may be water cooled. Fig. 5 shows a section of a vessel comprising an inner wall *b* and an outer wall *b'*, with intermediate portions *b''* separating the chambers *a* which receive the carbon conductors. The chambers are spaced unequally to produce a higher temperature at one part than at another. Fig. 4 shows a crucible *b* heated by a carbon resistance *a* surrounding it, and Fig. 6 shows a crucible heated by suspending the heating-body *a* within it. The current may

also pass from end to end of a box or trough containing the granular carbon. Fig. 9 shows a pot or crucible furnace for glass-making, and Fig. 12 shows a melting or heating furnace of large



dimensions, *d* denoting the conductors and *a* the carbon mass in each case. Fig. 16 shows a heating-conduit for progressive drying, calcining, &c. Mixture of clay and graphite &c. may be used instead of granular carbon. Among the purposes to which the invention may be applied are the heating of rooms, and of cooking-apparatus, distilling-retorts, apparatus for vaporizing liquids, &c.

**24,241. Bangert, M. Nov. 5.**



*Heating liquids.*—

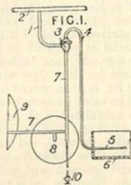
Apparatus for heating water or other liquid to a predetermined temperature by the consumption in a spirit lamp or the like of a definite quantity of combustible is shown in vertical section in Fig. 2. The water reservoir *a* is traversed by three pipes or flues

*p*. The spirit or other lamp employed, shown in plan in Fig. 4, has a small container *h* enclosing

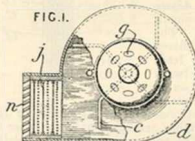
the wick, and of definite capacity, and adapted to be immersed in the large container *g*. The container *h* is elevated by the segment *k* and racks *i*, being guided by the bar *m* and rails *n* on one side and by the rails *o* on the other side.

**24,302. Knowles, W. Nov. 6.**

*Heating liquids.*—A device for supplying dry steam to heat the size contained in the size box 6 of sizing or slashing machines, also applicable to mercerizing, bleaching, dyeing, and other apparatus in which boiling backs and drying cylinders are employed, consists in passing the steam from the supply pipe 2 along a branch pipe 1 to a steam separator 3, which allows the dry steam to pass along the pipe 4 and delivers the water of condensation, together with some steam, down a pipe 7. The pipe 7 communicates with drying-cylinders 8, 9, and is fitted with a relief valve 10. Steam may be taken from the pipe 4 to a boiling back. The Provisional Specification describes a modification in which the separator is dispensed with and the pipe 4 is connected to the pipe 1 leading to the pipe 7.



**24,340. Petersen, M. Nov. 6.**



*Heating by electricity.*—A centrifugal air-fan *c*, an electromotor to drive it, and frames carrying zig-zag resistant wires *j* to heat the discharged air, are contained in a portable casing *d*, which may be ornamented. Air holes *g* are provided in the part of the casing containing the motor, so that air is drawn in through the motor. Resistances for use with the motor may be placed in front of other air inlets. The air is discharged through inclined slots *n*, to direct it downward upon the floor of a room to be heated. The supply of current to the apparatus may be controlled by a thermostat.

**24,359. Weber, A.** Nov. 6.

*Non-conducting coverings and compositions.*—Relates to the manufacture of a substitute for stone, wood, cork, and the like, which is a non-conductor of heat, and is fireproof, sound-proof, and damp-proof. The material may be moulded into plates, tiles, bricks, &c., for flooring, roofing, and other building purposes, or as a non-conducting composition for chimney stacks, ice-cellars, cooling-plant, &c. It does not decay, and is proof against parasites and vermin. When treated with oxygenized linseed oil it is quite waterproof. The material is prepared as follows:—Sawdust, wood shavings, &c. are boiled in a copper, and are treated for three days with lime water. The sawdust &c. is then mixed with pumice powder, Portland or other cement, burnt clay, and a solution of clay acidulated with sulphuric acid. Scrap iron and sulphuric acid are added. The compound is kneaded, stamped, and mixed, and is pressed into moulds. The blocks &c. produced may be coloured, ground, stained, and polished to imitate natural wood. Separate parts may be united with glue, cement, lime mortar, &c.

**24,517. Hankin, M.** Nov. 8.

*Heating by electricity.*—Resistances for use in electrical heating apparatus consist of partly metallic powder contained in insulating cylinders having means for varying the degree of compression of the powder. The resistance is placed in circuit by leads *g* clamped between nuts *h, n* on a screwed spindle *e* projecting into one end of a cylinder or tube *c*. There is a similar arrangement at the other end of the tube. The tube *c* may be of porcelain, fireclay, or other insulator, but is preferably of mixed mica and fireclay. It is filled with a powder *d* composed of metals such as tin, iron, lead, copper, gun-metal, or aluminium, and of fireclay, mica, asbestos, or slags, the material and size of the particles depending upon the electric resistance required. The constituents may be mixed as powders, or the metals may be melted and the other substances added. The pointed end of the spindle *e* is provided with projections to secure good contact. A tube *a*, preferably of iron or steel, surrounds the insulating-tube *c*, which may be actually made inside it by filling up with the insulating composition and pushing a rod in centrally. To the end of the outer tube is screwed the cap *b*, and to this the spindle is secured by the nuts *n, n'* and washer *c'* bearing on the shoulder of

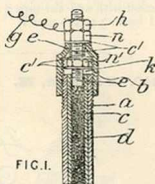


FIG. 1.

the cap. These nuts also clamp insulating-washers *c'*, and the space *k* may be filled with insulating-composition. By screwing the cap up or down, the compression of the resistance powder may be varied. Solid resistance bars or plates of a similar composition may be formed by adding a binding-material and subjecting to pressure. The resistances may be arranged in series for heating purposes in electric stoves, radiators, ovens, boilers, grills, and the like.

**24,655. Kitchen, J.** Nov. 11.

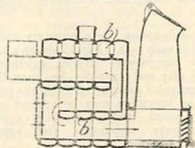
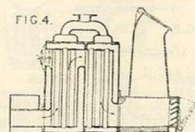
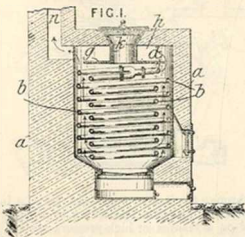


FIG. 8.

*Heating water.*—Fig. 1 shows a simple arrangement of fuel-burning chamber *e* in conjunction with the hot water boiler *b*. The deep hopper *l* supplies the chamber *e* to which air is admitted through the grating *i*, the supply of air being controlled by the hinged door *k*. Firebrick *g*, or water spaces in substitution thereof, are provided. Cross water-tubes *e* are fitted to the boiler, which may be of cast or wrought iron, or of steel plates, as also the stove. Fig. 4 shows another form of boiler made up of sections, the water-spaces of which are connected by vertical tubes. The course of the gases is indicated by the arrows. For steam-generating purposes, the upper space is enlarged, while the boiler is constructed of wrought iron or steel. Fig. 8 shows a cast-iron boiler with transverse and

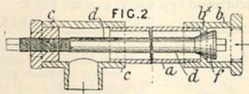
vertical water-spaces *b*, the gases in taking the circuitous path indicated by the arrows being baffled by the opposition of vertical water spaces to blank spaces between the neighbouring water-elements.

24,814. **Ralph, J.** Nov. 12.



*Heating water.*—A boiler, which may be used for greenhouses and conservatories, consists of two helical coils of piping *b* joined together at their inlet and outlet ends *d* and enclosed in a "wall and covering" *a*, which also contains a grate and a smoke-box *h*, the latter being formed by the plate *g* and provided with an opening surmounted by a tube *k*. The products of combustion are compelled by the plate *g* to pass through and around the water coils to the flue *n*. The tube *k* serves for feeding.

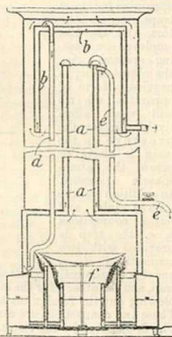
24,996. **Thomson, G. H.** Nov. 14.



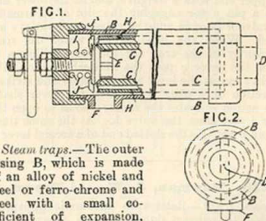
*Steam traps.*—The trap comprises the external copper or brass tube *a*, to which is screwed the coupling *b* having the valve seating *b^x*, the internal adjustable rod *d* of iron or steel provided with the conical or spherical valve *f*, and the tee-piece *c*. The parts are so arranged that at a normal temperature the seating *b^x* is at a distance from the valve *f* sufficient to allow air and water to escape from the steam pipe, but when the temperature is raised by the admission of steam the seating is forced against the valve and the escape of steam is prevented.

25,028. **Kemper, A., and Damhorst, F.** Nov. 14.

*Heating water.*—The water heater consists of a principal inner heater having a narrow cylindrical portion *a*, a cap-shaped feed-heater or preliminary heater *b* fitted over the upper portion *a*, and a spirit or other burner *f*, the gases from which flow over the walls from the inside to the outside. Water is fed to the bottom of the water chamber or heater *b*, and afterwards passes by the pipe *d* to the bottom of the heater *a*, from the top of which it is withdrawn by the pipe *e*.



25,135. **Granger, W. A.** Nov. 15.



*Steam traps.*—The outer casing *B*, which is made of an alloy of nickel and steel or ferro-chrome and steel with a small coefficient of expansion, carries the usual valve *E* which seats on the end of an expanding tube *U* of steel or brass fixed to the cap *D*, which, upon the entry of water, contracts and opens the valve to allow of the ejection of water through an opening *F*. A second expanding tube *H* comes into play at high temperatures by abutting against flanges *J* on the valve and thus keeping it open against a spring *I*. In a modification, the valve is operated by one end of a lever pivoted at the middle to a rod of nickel-steel and acted upon at the other end by an expanding tube connected to the expanding casing by a non-expanding rod. A similar compound system may act upon the fulcrum of the lever acting on the valve.

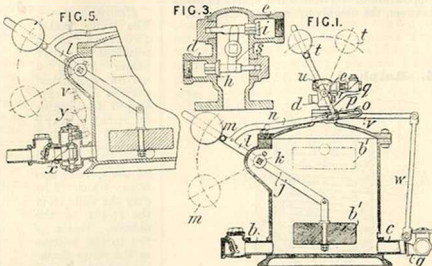


**25,234. Nesbit, D. M.** Nov. 17.

*Steam traps.*—

Relates to blow-out apparatus for steam traps, grease separators, and the like employed on heating systems &c., the object being to provide a form of apparatus which will work effectively whether the pressure in the main is above or below the atmospheric pressure. In addition to the usual inlet and outlet connections *b*, *c*, the trap is provided with two connections *d*, *e*,

one *d* from the main to balance the pressure in the trap, and the other *e* for the inlet of air or steam for blowing out the foreign matter which accumulates. These two connections are controlled by valves *h*, *i*, Fig. 3, operated by the rise and fall of the float *b'*, which is carried by an arm *j* on a shaft *k*. Outside the casing, the shaft *k* is fitted with an arm *l*, carrying a balance weight *m* and having an extension to which is attached a link *n* with a slotted end *o*. A lever *q*, mounted loosely on a shaft which carries a rocker *s* for the valves *h*, *i*, is provided at its upper end with a weight *t*, and at its lower end with a pin *p* for engaging the slot *o*. Normally, the valve *h* is open and the valve *i* and outlet *c* are closed. When the level of the water has risen sufficiently in the trap for the slotted link *n* to throw the lever *q* past the vertical position, the weight *t* causes the lever to fall rapidly and strike a projection on a plate *u* fixed to the lever shaft. This action operates the rocker *s* so as to open the valve *i* and close the valve *h*. At the same time, the pin *p* engages the slotted end of a second lever *v*,

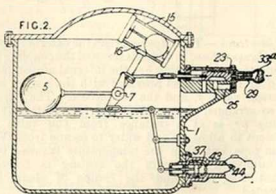


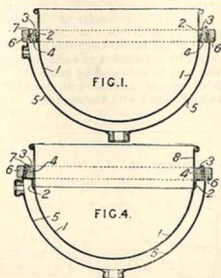
and, through the link *v*, opens the valve *g* in the outlet *c*. Air or steam, according to whether the trap is on a vacuum or high-pressure system, then enters the top of the trap through the connection *e* and causes the water to be discharged. As the level falls, the float *b'* drops and the slot *o* of the link *n* slides freely over the pin *p*, until the float approaches its lowest position, when the link *n* throws the lever *q* back past the vertical position. The weight *t* then brings the lever into contact with a second projection on the plate *u* so as to open the valve *h* and close the valve *i*. At the same time, the valve *g* is closed by the pin *p* operating the link *v*. Waste of steam is prevented by so arranging the links *n*, *v* that the valve *g* is operated before the valve *i*. In the arrangement shown, an ordinary gate valve is provided at *g*, but any other suitable form of valve may be used. For example, an equilibrium valve may be used as shown at *x*, Fig. 5. In this case, the lever *v* is worked off a pin on the lever *l*, and the valve *x* counterbalanced by a weight *y* on the link *v*.

**25,236. Newman, J. W., and Brown, C.**

Nov. 17.

*Steam traps.*—Relates to automatic apparatus adapted to exhaust liquid from a separator, or vacuum pan, or from any reservoir containing liquid whether the pressure in the reservoir is above, below, or the same as atmospheric pressure. The exhaust water trap or similar apparatus is provided with the inlet and outlet ports 25, 43, and their controlling slide and piston valves 23, 37, with the float 5 on the transverse shaft 7, the box 15 and the movable weight 16 connected to the shaft 7, and the valve-operating links, and with the inlet check valve 33<sup>a</sup>, the vent valve 29 controlled by the valve 23, and the outlet check valve 44. The various link connections are made by pins and slots, and discharge takes place when the weight 16 is overbalanced and the valves occupy the positions shown in Fig. 2. The vent valves 29 breaks any vacuum that tends to form within the vessel 1.

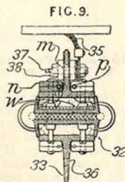


**25,248. Missner, M.** Nov. 17.


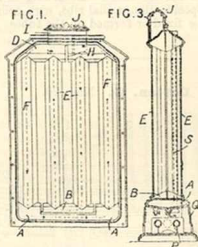
*Boiling-pans.*—Relates to a method of fastening the jackets of double-walled vessels, the object being to fasten the jacket without rivets or screws. A steam-jacketed boiler is shown in Fig. 1. To the outer surface of the inner wall of the vessel the annular trough 2, 3 is fastened by soldering, and the outer wall of the trough is folded or bent over the ring 4, the outer face of which is slightly conical or bevelled, and the jacket 5 is placed round the bent part 3 of the trough and pressed against it by the ring 6 preferably shrunk on and provided with a suitable conical or bevelled face. The projecting ends of the parts 3, 5 may be jumped or upset, as at 7, or they may be bent or flattened, and the ring 4 may be flanged. In Fig. 4 the joint is shown formed between the jacket 5 and the vessel 1 by the trough 3 of the vessel with the rings 4, 6, the rim 8 being riveted to the lower part 1 of the vessel.

**25,314. Perky, H. D.** Nov. 18.

*Heating by electricity.*—Relates to apparatus for baking biscuits, crackers, and the like, formed from fibrous, filamentous, or shredded grain or other material. The apparatus comprises an oven or casing fitted with an outer and an inner endless baking chain or band each having irons preferably heated by electricity, and provided also with a continuous feed and cutting device, a pneumatic feed-transfer device, and a discharge device and conveyer. The links of the baking-bands comprise elongated body portions or plates 32, Fig. 9, having middle ribs 33 provided with

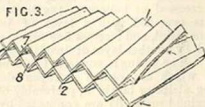


arms forming the link connections. Detachable irons are arranged in series along the plates 32, and are recessed or hollow at the back, and this portion is provided with a layer of insulating material or paint, and receives fine wiring *w*, which is covered by another layer of insulating material or paint. The wiring is connected to conducting-wires *p*, which are seated between detachable insulating strips or blocks *n*, preferably of porcelain. Spring brushes 35 are connected by flexible wires 38 to their respective wires *p*. The brushes are carried by short conducting bolts or pins 37 seated in non-conducting bushings *m* located in openings 36 in the ribs 33, and corresponding insulated outer and inner contact-bars are provided. The outer band extends beyond the inner band for feeding and discharging purposes, and this extension is not required to be heated, and in order to cut off the current gradually, one of the outer contact-bars is separated at the feed end of the oven into contact sections, which are connected to the body portion of the bar by a graded series of resistances. The spring brushes are usually formed of two leaves so that the breaks of the current at the cut-off intervals will not be too pronounced.

**25,339. Sinclair, D.** Nov. 18.


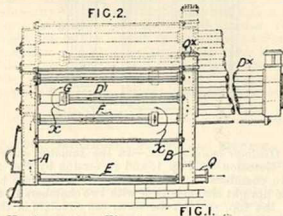
*Heating buildings &c.*—In the radiator shown in elevation by Fig. 1, and in section by Fig. 3, two chambers A, B in the base communicate by the upright channels E, F with two chambers D, H at the top, so that the water can circulate in the way indicated by the arrow. A water reservoir I, fitted with a perforated cover J, is placed at the top. The apparatus is placed upon a loose foot Q in which a gas burner &c. P may be fitted. The inner joints connecting the uprights are left open to allow of a limited lateral flow. A tube S may be fitted to carry off the fumes. An electric heater may also be employed. The resistance coil is separated by packing from a wrought-iron tube introduced to one of the water spaces.

25,409. Greiner, H. R. Nov. 19.

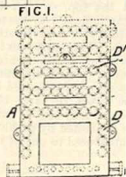


*Heating liquids; heating buildings &c.*—An apparatus, intended chiefly for use as a water cooler for motor cars, but applicable also as a liquid heater or radiator, comprises a number of corrugated flat tubes disposed one above the other, with the corrugations in each tube arranged at an angle with those in the adjacent tubes. In the accompanying Figure, only two tubes 1, 2 are shown. The water to be cooled passes through the tubes and the air enters the channels 7, 8. This air is prevented from passing straight through the channels by the corrugations, and is thus forced to remain for some time in contact with the cooling-surface. The tubes are connected at one end with a common supply tube and at the other with a collecting pipe or tank, or each tube can have its own supply and collecting pipes. Instead of the arrangement shown, each wide tube may be replaced by a number of narrow tubes. According to the Provisional Specification, radial ribs, wire coils, or the like may be fixed or formed on the tubes.

25,462. Cotton, G. Nov. 20.

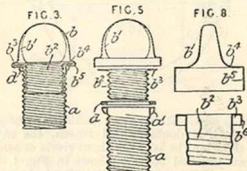


*Heating water.*—Fig. 1 shows a front view, and Fig. 2 a longitudinal section, of a hot-water circulating boiler in which the walls of the grate, flues, &c. are built up of laterally-abutting tubes. Headers A, B are connected by a number of tubes D, D', which form the walls of the spaces. Water enters at Q, and



passes by the hollow firebars E to the header A, from which, by the tubes forming the side walls and the tubes F, it returns to the header B to pass again to the header A by tubes G returning by tubes D' to the outlet Qx. At opposite ends of the boiler, the tubes are shortened and connected by cross-tubes to form flue openings z. The flue may be extended by tubes Dx. Each tube D is of square section with rounded ends stepped to make joint with the header.

25,573. Purser, A. J. Nov. 21.

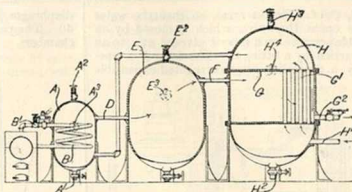


*Hot-water bottles and the like.*—A screw stopper for hot-water bottles and other receptacles consists of a socket a and a plug b. The socket a has a flange a' and is formed of aluminium or other sheet metal, as is also the plug part b, which is formed preferably of a head b', shaped conveniently for turning, and a shank b'', which has a screw to fit the socket. The shank b'' has a flange b'', and the head has a base b', Fig. 5, with a hanging flange b', which fits on to the flange b'', the two parts being secured together without soldering by turning over the edges of the flanges or in other suitable ways. Fig. 8 shows a method of securing the parts, in which the flange b' has hanging portions b'' over which the edges of the flanges b'' are turned. A washer d is used. When used with rubber water-bottles, the neck of the bottle is moulded to the socket a; with glass bottles, the socket a is fixed in cork.

25,620. Tuckfield, C., and Garland, W. G. de F. Nov. 21.

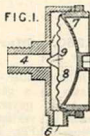
*Heating water.*—Water for domestic or general purposes or for boilers is purified, softened, and sterilized, and matter contained in it is separated, by a heating and settling process. Water forced through the pipe H' into the chamber H, passes up through the pipes G' of the heat-exchanger G, and through the pipe J to the chamber A, where it is superheated by means of the pipe B. The heated water flows through the pipe D into the chamber E, thence through the pipe F to the body of the heat-exchanger G, and is drawn off through the cock G'. The impurities deposited in

the chambers A, E, H are drawn off through cocks A', H' etc. The chambers are lagged or steam-jacketed to prevent loss of heat, and are provided with scum cocks A'', E'', H'' and with thermometers A<sup>3</sup>, E<sup>3</sup>, H<sup>3</sup>. The steam admission valve B is governed by means of the thermometer A<sup>3</sup>. The pipe B may be perforated. The Provisional Specification states that a coil is used in place of the heat-exchanger G.

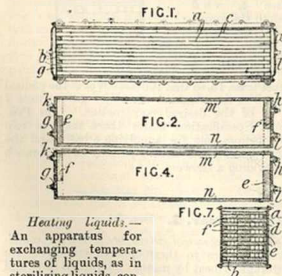


### 25,858. Still, W. M. Nov. 24.

*Steam traps.*—Relates to improvements on the invention described in Specification No. 21,571, A.D. 1902. A fluid-containing expanding chamber is formed between a corrugated diaphragm 8 and a dish cover 7, exposed to the atmosphere, which is screwed into the casing 1, which is screwed into the casing 1. The diaphragm 8 is made with a central cone-shaped projection, which seats upon the inlet 4. The water escapes by the outlet 6. The trap is regulated by screwing the cover 7 more or less into the casing. In the Provisional Specification it is stated that the fluid-chamber may be formed between two diaphragms.



### 26,073. Desmaroux, L. Nov. 26.



#### Heating liquids.

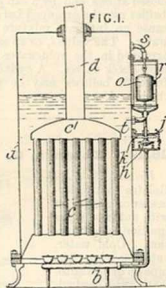
—An apparatus for exchanging temperatures of liquids, as in sterilizing liquids, consists of two series of compartments *a, b*, formed by metallic sheets *c*, separated by rods *d*, through which the liquid to be heated and the heating-agent respectively flow. Blocks *e, f* are placed at alternate and opposite corners as shown in Figs. 2 and 4, and the alternate

compartments *a, b* are connected to collectors *g, h, k, l*, which are bolted to the lateral cheeks *m, n* to form the ends of the apparatus. By means of baffles, the liquids may be made to travel successively through two or more compartments.

### 26,171. Jones, C. J., and Still, W. M. Nov. 27.

#### Heating water.

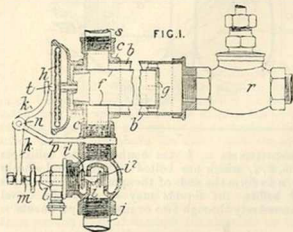
—Relates to apparatus for making tea, coffee, and other infusions. The water is heated in a vertical boiler *a*, the supply to which is regulated by a valve which turns on a horizontal hinge and is actuated by a float *o* in a small chamber *r* connected at its top and bottom by pipes *s, t* to the steam and water spaces, respectively, of the boiler. The boiler is heated by a gas burner *b*, the flames of which pass up vertical tubes *c* arranged in the water space of the boiler and opening into a common chamber *c'* leading to the chimney *d*. The gas supply is regulated by a valve *h* carried by the lower of two corrugated metal discs *j*, forming an enclosed chamber *k* which is in communication with the steam space of the boiler. A bye-pass prevents the gas from being entirely shut off from the burner.



### 26,283. Buley, J. Nov. 28.

*Thermostats.*—The temperature of the water supplied through a valve *r* to a bath or other receptacle is controlled by a valve *i* in the hot-water inlet *j*. This valve has a spindle *l* and two

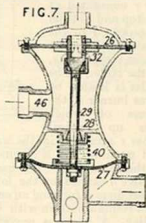
parts  $i^1$ ,  $i^2$  of different areas, so that the water pressure opens the valve, which is closed by an adjustable screw  $m$  on a lever  $k$  pivoted at  $n$  to an arm  $p$  carried by a fitting  $c$ . The lever  $k$  is operated by a projection  $t$  in a corrugated expandible



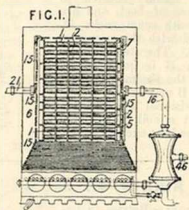
chamber  $h$  communicating with a closed tube  $f$ ; this tube is enclosed by a chamber  $b$  situated between the valve  $r$  and the fitting  $c$  into which the hot and cold water inlets  $j$ ,  $s$  open. The tube  $f$  may be closed at one end by a cap  $g$ , and helical or other baffles may be arranged between the two tubes to cause an intimate mixture of the hot and cold water. The valve  $i$ , or an additional valve, may be arranged in the cold-water inlet, and both inlets have check valves. A cylinder and piston or any form of bellows may be used in place of the chamber  $h$ .

**26,297. Losange, C.** Nov. 28.

*Heating water.*—Relates to a water-heater or gas geyser with automatic gas ignition and extinction. Cold water, entering by the pipe 46 of the automatic gas-controlling device shown in Fig. 7, passes through the openings 32 in the upper end of the rod 29 to the supply pipe 16, and to the pipes assembled in groups to form a casing round the tubes 1 and plates 2, after which the water passes from the box 7 through the tube system 1 to the bottom pipes or tubes 1 and to the outlet pipe 21. The tubes 1 are semi-annular or U-shaped in section, and are assembled in groups by means of casings or boxes mounted upon the outer plates 5, 6. In the distributing-device, Fig. 7, the flexible diaphragms 26, 27 are connected by the rod 29, and the gas-control

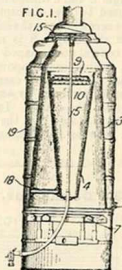


diaphragm 27 is pressed downwards by the spring 40. The partition 28 separates the water and gas chambers.



**26,360. Marks, G. C.,** [Cohen, M. I.] Nov. 29.

*Heating water.*—Relates to a gas-heated geyser, shown in vertical section in Fig. 1. Water is admitted by the pipe 5, and discharged in the first place through perforations in to the space formed between two shallow trays 9, 10 having waved edges. Thence it trickles down the conical surface 4, and passes to the annular chamber 19 by the pipe 18. A further quantity of water is discharged by cross-arms 15, so that it descends over the conical surface 3 to the chamber 19. The gas burners 7 may be of the desired construction. The Provisional Specification states there may be two draw-off pipes, one for supplying a basin and the other a bath. The bath pipe may have a branch for providing a shower.



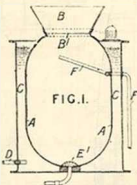
**26,411. Timar, I.** Dec. 1.

*Heating by chemical action or molecular combination.*—Relates to thermophores employed for the storage of heat by means of liquefied salts, and especially to thermophores such as hot pillows or bolsters, the sides of which are made of india-rubber or other soft substance. To prevent damage to the sides of the receptacle, owing to the formation of hard lumps as the salt mixture crystallizes, and also to avoid the usual disagreeable odour from the salt, as when sodium acetate is

employed, sunflower seeds, Greek hay seeds, or similar vegetable seeds which contain viscous substances and a fat which does not affect the india-rubber &c., are added to the mixture of salts. The seed is dissolved in hot water and mixed with the thermophore salt.

**26,728. Johnson, A.** Dec. 4.

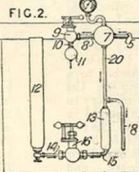
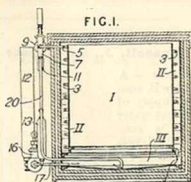
*Boiling-pans.*—Apparatus for extracting oil from fish livers or the like, for use on board ship or on shore, comprises a vessel A furnished with a hopper-shaped top B, forming a baffle B', and surrounded by a water-jacket C. Any suitable mixing apparatus may be employed. The water-jacket C is heated by means of the steam pipe D, and steam is introduced to the vessel A through the rose E'. The fish oil is drawn off through the siphon F. In modifications, the water-jacket is heated by solid or by liquid fuel, and steam from the water-jacket is supplied to the contents of the vessel A.



**26,792. Seifert, A. E.** Dec. 4.

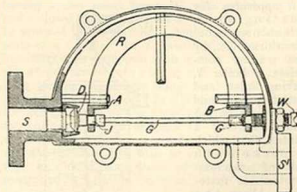
*Thermostats and other apparatus for automatically regulating temperatures.*—In producing constant previously-determined low temperatures for scientific and technical operations, apparatus such as that shown in Figs. 1 and 2 is used. Liquid carbon dioxide stored in a vessel 12 flows through the pipe 14, reducing-valve 16, and pipe 17 to an expansion chamber III, where it expands and crystallizes, and is dissolved by ether, which also enters the chamber III from the vessel 13 through the pipe 15, valve 16, and pipe 17. The gas escapes from the chamber III through a pipe 4 to a coil 3 in a chamber or space II containing a cryohydrate of a determined critical or cryohydral temperature and surrounding the chamber I which is to be kept at a constant low temperature. The coil opens at the top to a pipe 5 leading to a vessel 7 in which the gas is separated from any ether carried with it, the ether flowing back by the pipe 20 to the vessel 13. From the vessel 7, a pipe 8 leads to a pressure-regulating valve 9 and from this a pipe 10 leads to a thermo-regulator 11 from which the spent gas escapes to the atmosphere. When the cryohydrate congeals, it is adapted to give off heat while maintaining a constant temperature and thus to serve as a "cold" accumulator. The valves 9, 16 are so adjusted that this constant temperature is maintained. The ether returns to the chamber 13 by a pipe 18. A modification is described in which the cold accumulated in the

ether is also utilized in cooling the cryohydrate, the expansion chamber being in this case surrounded by the cryohydrate and fitted with a wool



or like texture to permit the ether to act on the crystallized carbon dioxide in a uniform manner.

**26,981. Russell, F. M., [Heintz, A.]** Dec. 5.



*Steam traps.*—Relates to improvements in the automatic steam trap described in Specification No. 15,581, A.D. 1901. The ends of the expansion tube R terminate in sliding pieces A, B which are slotted to receive a neck J on the spindle of the valve D and a neck on the regulating-screw W respectively. A rod G is supported in a socket in the end of the screw and connected to the valve spindle, and the movement of the valve is directed by guides projecting from the valve seating which is fitted in the trap inlet S. The tube R is contracted, and the valve remains open until steam and

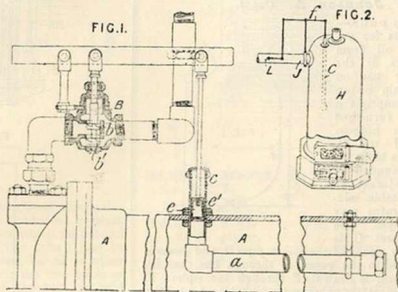
water of condensation passing through the trap to the outlet S' heats the tube sufficiently to expand it and thus to close the valve. As the trap cools,

the tube contracts and opens the valve, and collected water followed by steam passes through the trap until the heat again closes the valve.

27,271. Russell, J., and Rosser & Russell. Dec. 10.

*Thermostats.*—A balanced valve B, controlling the supply of steam to a hot-water cylinder A, is connected through levers to a float e, resting on the surface of mercury in a closed tube a, which is supported within the cylinder A. The damper L, Fig. 2, in the flue J of a boiler H, may also be controlled through levers f attached to a float resting on the surface of mercury in a tube c supported in the boiler H. The two valve heads b, b' of the valve B have their edges notched, and work as pistons through their seats.

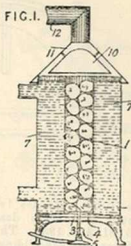
The float e is preferably hollow, and has longitudinal tapering grooves e' to allow the mercury to return freely as it contracts.



27,365. Woodcock, J. T. Dec. 11.

*Heating water.*—

An apparatus for heating rooms, greenhouses, conservatories, &c., by hot water comprises a boiler 7, having inlet and outlet pipes, and a stove or burner placed under a central flue, which is packed with balls of some non-combustible material. Above the flue 1 is a conical baffle 10, which is surmounted by a cover 11, allowing space for the products of combustion to pass to the chimney 12. Air inlets 4 and fuel inlets 3 are provided in the bottom of the flue 1.

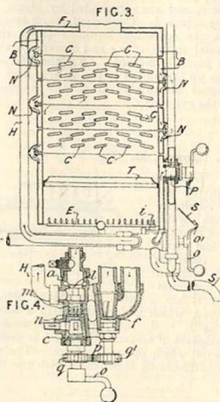


27,389. Spühl, H. Dec. 11.

*Heating water.*—The water to be heated for baths &c. flows through a series of flat pipes C, arranged over a gas burner E and connected to hollow frames B. A combined gas and water cock controls the supplies of gas and water. The hollow frames B are connected by nipples N to each other and to the hollow cover F, through which water from the supply pipe H flows. The pipes C slope one above the other, so that any water which may leak falls ultimately into the channel T. The combined cock is shown in section in Fig. 4, and comprises a gas valve f, a water valve a for controlling the supply of water to the heater, and a water-outlet valve c for emptying the heater when not in use. The valve cone l is operated by a tappet n secured to the plug p of the valve c, both valves c and a being thus operated by a handle o which carries a pointer o' moving over a plate s. The valve f is also operated by the handle o through the toothed segments q, q'. As the handle o moves, the valve c is first closed, and the valves a, f are gradually opened, the "lighting" pipe i being supplied before the burners E. By means of a cock P, the heater may be connected either to the shower or the discharge pipe S.

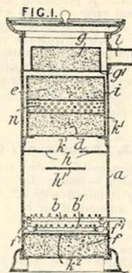
(For Figures see next page.)

27,389.



27,546. Souheur, J. Dec. 13.

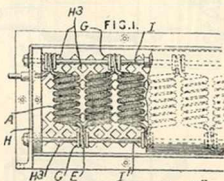
*Heating buildings &c.*—One or more masses of refractory materials, such as fossil meal, kieselsuhr, ground or flaked mica, asbestos, talc, graphite, and French chalk, separately or in combination, are arranged in the interior of a heating apparatus burning gas, coal, alcohol, petroleum, or the like. These masses absorb heat from the products of combustion and the vapours which condense when the stove is extinguished. A gas stove is shown



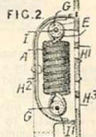
having a double burner ring *b, b'* enclosed by a casing *a* with air inlets *f* and baffles *h, h'*. Three permeable heat retainers *d, e, f* and an impermeable heat retainer *g* are shown. The retainers *d, e* have a perforated metallic casing *k* divided by transverse perforated partition plates *k'* so as to form an intermediate chamber *n*. An annular space *i* is left round the casing *k*, or valves are provided in the retainers *d, e*. The retainer *f* has a perforated

cover *k'*. The casing of the retainer *g* has a perforated projecting rim *g'*, through which the products of combustion pass to the chimney flue *l*.

27,757. Carolan, E. A., [General Electric Co.]. Dec. 16.



*Heating by electricity.*—The heating-coils *A* are built up from a flexible insulated core bent into a series of alternate helical coils and bends or loops, with a resistance wire or wires helically



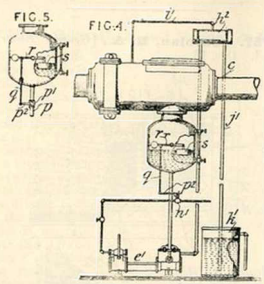
wound round about the coils of the core. The core is sufficiently rigid to retain the shape into which it is bent, and is supported at the bend or loops *E* by the grooved insulators *G* on the rods *I, I'*. The coils *A* are mounted in the case *H* having a cast-metal front *H'* with openings *H''*, and a closed sheet-metal back *H*. The case may be screwed to the wall of a building or under the seats of a vehicle. In a modification, the flexible insulated core is wound with resistance wire, and the whole formed into a helix and inserted into a tube, the resistance wire being insulated from the tube by insulated wire. In a further modification, the coil is made in the form of a flat spiral and the core is included as part of the circuit. A number of connections may be made with intermediate points of the coils to vary the amount of wire in circuit, and these connections may be controlled by suitable switches.

28,085. Osbourn, M. P. Dec. 19.

*Steam traps.*—An apparatus for discharging the oil and oily water separated from steam consists of a drip chamber, the discharge valve of which is controlled by a float-and-lever arrangement. Where a pressure is maintained in the separator, the valve *p'* in the discharge pipe *p* is controlled directly by a float-and-lever arrangement, Fig. 5, so that the drips will be discharged only when a certain level has been reached. Where a partial



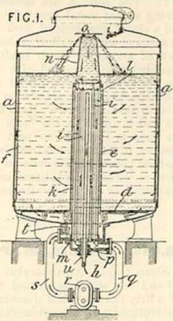
vacuum is maintained, the float-and-lever arrangement is connected to the valve  $n^1$ , Fig. 4, which controls the supply of steam to a pump  $e^1$  employed to force the drips from the drip chamber to a



chamber  $h^2$ , which communicates by a pipe  $i^1$  with the separator, and by a pipe  $j^1$  with a seal pot  $k^1$ . The automatic float-and-lever regulator consists of a float  $s$ , Figs. 4 and 5, connected to a lever  $r$ , which has one arm inside the drip chamber, and the other connected by rods  $q$ ,  $p^2$  to the valves  $n^1$  or  $p^1$  outside. The pump  $e^1$  is preferably below the level of the contents of the drip chamber.

**28,100. Gebauer, J. Dec. 19.**

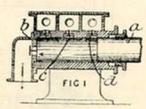
*Heating liquids.*  
—Relates to apparatus for treating fibres, yarns, fabrics, and other materials with heated liquid in dyeing, bleaching, scalding, scouring, &c. The materials to be treated are placed in a vessel  $a$  above a perforated false bottom  $d$  between a perforated cylinder  $f$  arranged near the outer side of the vessel and an inner perforated tube  $e$  arranged outside a heating-appliance  $k$  terminating in a conical tube  $n$  provided with a deflector  $o$ . The spaces between the parts  $e$ ,  $k$  and under the plate  $d$  communicate with a tube  $s$  leading to a pump  $r$  connected by a pipe  $q$  to a



chamber  $p$  arranged under the heater  $k$ . Pipes  $i$  connecting plates  $l$ ,  $m$  lead from the chamber  $p$  to the tube  $n$ , and are surrounded by steam which enters by a pipe  $h$ . Condensed steam escapes by a pipe  $u$ . In operation, liquid is drawn through the material to the tube  $e$  and chamber  $t$ , where it becomes partially heated. It is then forced by the pump up the pipes  $i$  to the tube  $n$ , from which it is ejected uniformly on to the material and through the cylinder  $f$ .

**28,242. Josse, E. Dec. 22.**

*Steam traps.*—For removing the water of condensation from water separators, heating-jackets, and intermediate receivers of steam engines, with a minimum escape of steam, a pump with a long plunger  $a$  is employed, which is provided with a series of feed-valves  $b$ ,  $c$ ,  $d$ , that open in succession to higher pressures of steam. Thus each is closed by the pressure which opens the next. The pump may be double-acting if provided with two sets of valves.

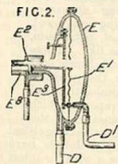


**28,339. Rollins, R. W. Dec. 23. Drawings to Specification.**

*Thermostats.*—In refrigerating-apparatus, a thermostat is preferably used, which may consist of a bent strip of metal which, on expanding by reason of a rise in temperature, makes an electrical circuit which controls the valve for admitting the refrigerating-fluid; or, instead of a strip of metal, the thermostat may consist of a column of mercury, which on expanding serves to make contact with an electrode at the top.

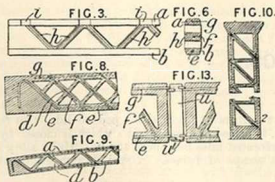
**28,343. Armstrong, C. G. Dec. 23.**

*Heating buildings &c.; thermostats.*—Steam for heating is mixed with a certain amount of air or other gas which does not condense with the steam. The gas accumulates in the radiator when the steam condenses, and thus prevents the ingress of further heating-fluid until the gas has been discharged. By regulating this discharge, the heat given out by the radiator is therefore also regulated. The gas may be fed to the boiler by a pump, or it may be mixed with the steam after leaving the boiler, a thorough mixing being secured by passing the two together through a



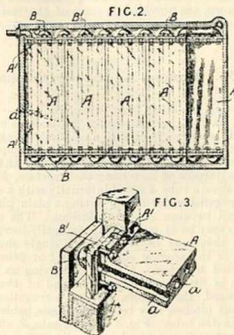
chamber furnished in the baffles. The discharge of gas from the radiator may be regulated either by hand or by an automatic device, part of which is shown in Fig. 2.  $E^6$  is a non-conducting or other connection with the radiator leading to a chamber  $E$  which is divided into two parts by a flexible diaphragm  $E^1$ . The diaphragm actuates a valve  $E^7$ , which controls the discharge of gas to a suction exhaust  $D$ . A pipe  $D^1$  leads to a distant thermostat device only when the temperature falls below the normal. The end of the pipe  $D^1$  which is within the right-hand part of the chamber  $E$  is closed by a small pin, which passes loosely through the diaphragm  $E^1$  and is controlled by a thermostatic device  $E^8$ . If the temperature falls, the distant end of the pipe  $D^1$  is opened, and air enters the chamber  $E$ , and the suction through the pipe  $D$  moves the diaphragm  $E^1$  and thus opens the valve  $E^7$ . The discharge of gas now proceeds, until heating-fluid reaches the thermostat  $E^8$ , which then closes the pipe  $D^1$ . The suction now equalizes the pressure on both sides of the diaphragm  $E^1$ , the space round the pin allowing air to pass to the left-hand side. When this takes place, the diaphragm closes the valve  $E^7$ . The thermostat  $E^8$  then cools, and opens the end of the pipe  $E^7$ , and, unless the distant end of this pipe has in the meantime closed in consequence of the rise of temperature in the room, more air enters the chamber  $E$ , and the operations are repeated. If the thermostat  $E^8$  is found not to act rapidly enough, heating-fluid may be admitted directly, without passing through the radiator, to the connection  $E^8$ , in the manner shown.

## 28,382. Visintini, F. Dec. 23.



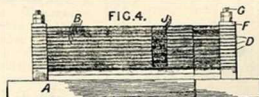
*Heating buildings &c.*—Cement or artificial stone lattice girders are strengthened by tie-rods  $g$ ,  $e$  connected by hooked diagonal rods  $f$  embedded in the flanges  $a$ ,  $b$  and the ribs  $d$  in tension. The girders are laid side by side to form ceilings, floors, and walls with continuous flues or passages for heating or ventilation, and are connected by cement run into recesses  $i$ ,  $h$  in the edges of the flanges  $a$  and webs  $d$ .

## 28,682. Shiels, A. Dec. 29.



*Boilers.*—Each element of a sectional boiler consists of a block of copper, gun metal, &c.  $A$ , Figs. 2 and 3, in which the tubes  $a$  are formed. The ends of these tubes are connected by short curved lengths  $B$  made with flanges  $B'$ , by means of which they are bolted to corresponding flanges  $A'$  on the blocks. The inner faces of these flanges may be ribbed to engage a packing-strip of copper. A number of units, such as shown by Fig. 2, may be arranged one above the other in a vertical casing, springing alternately from opposite sides so as to form a zig-zag flue of gradually-decreasing cross-section.

## 28,792. Krueger, M. C. Dec. 30.



*Heating by electricity.*—

Resistances for heating consist of strips  $B$  of tinned iron or other material, preferably of V-shape in section, arranged in piles with distance-pieces  $D$ , alternately of insulating and conducting material, between their ends, so as to connect them in series. The ends and distance-pieces may be perforated to receive insulated bolts  $G$ , provided with clamping-blocks  $F$ , to hold the pile upon a base  $A$ . Insulating-strips  $J$  may be laid between the resistances in any

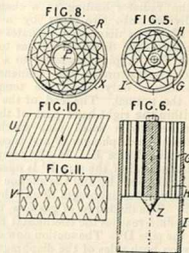


desired positions, to keep the resistances apart between their ends. Projecting connection pieces, not shown, are provided on some of the resistance strips, at one end.

**28,954. Dumas, A.,** [known as Gardeux, D.].  
Dec. 31.

*Heating buildings &c.; heating air.*—Sheet metal, having corrugations or projections of any suitable shape, is bent into a coil and arranged on the inside or outside of the tubes or pipes of radiators, hot air drying-apparatus, and the like, for the purpose of increasing their surface. Figs. 5 and 6 show a tube I fitted internally with a coil G of corrugated sheet metal, having a plain plate H arranged between the convolutions. The corrugations may be of uniform or gradually-increasing pitch; they may be formed in a single sheet of metal or in separate sheets, riveted or otherwise connected together. A cone Z, serving as a deflector, is fitted centrally at one end of the coil. If desired, three coils, having corrugations of different pitches, may be arranged one behind the other in the tube. Fig. 8 shows a tube P, such as used for a radiator, fitted externally with a coil R

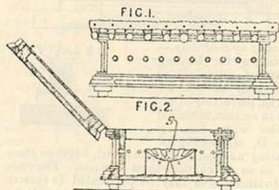
held in position by means of external rings X. In addition, the inner edges of the coil are soldered or otherwise secured to the wall of the tube or



pipe. Figs. 10 and 11 show sheets of metal formed with inclined corrugations U and projections V respectively.

A.D. 1903.

**237. Wetter, J.,** [Böngers, P.]. Jan. 5.



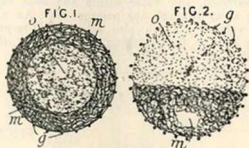
*Hot-water bottles &c.*—Relates to footwarmers combined with footstools. The footstool is made

in the form of a box with a padded lid. Hot fuel &c. is placed in a receptacle *s* which is closed by a perforated false bottom to the lid. Holes allow of the escape of fumes. A spring catch secures the lid.

**350. Mayer, A.** Jan. 6.

*Non-conducting coverings.*—In one form, the covering, which is made as a cord, consists of a core of silk or other organic material surrounded by mineral matter, such as slag wool, asbestos, or kieselguhr, the whole being bound together by a braiding of wire, asbestos, &c. Another form, also in the shape of braided rope, has one side of silk &c., and the other of mineral matter. These forms are shown in Figs. 1 and 2 respectively, *o* being the silk, *m* the slag wool, and *g* the asbestos

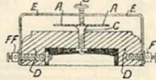
or wire braid. In the latter form, the mineral side, and, in the former, the mineral exterior, are exposed to the heat of the steam pipes.



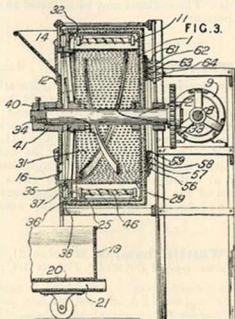
#### 414. Hall, E. S. Jan. 7.

##### Thermostats.

Relates to electric switches thermally operated so that a circuit is closed when the temperature of the part where the switch is situated exceeds a certain limit. Of the two terminals F, FF set on a wood block D, one is connected to the metal bridge E, to which is attached the screw B, and the other is attached to the screw C, which is in contact with a vessel formed of two metal plates A hermetically sealed together, and containing a highly-expansive liquid such as ether. When the temperature rises high enough, the ether distends this metal vessel and makes contact between the two terminals.



is provided by which either one, two, or three of the heaters in each set can be thrown into the circuit. The motor 9 is arranged in the same circuit, and switches are provided so that the motor



and the heaters may be independently energized. The roasted berries are discharged into a trolley 19 with a perforated bottom 20 having a space 21 below connected with an exhaust to expedite the cooling of the berries.

#### 542. Imray, O., [Lester, G. C., and Moegling, C. W. A.]. Jan. 8.

Heating by electricity.—Relates to an electrically heated and driven apparatus for roasting coffee. A rotary drum 1 is adjustably fixed on a shaft 2 driven by an arrangement of spur and bevel gearing from the armature shaft 8 of an electro-motor 9. The drum 1 is divided by a perforated partition 29 into a central roasting-chamber 31 and an outer annular chamber 32 in which the electric heaters are arranged. Helical agitating-blades 33, 34 are fixed in the chamber 31. One side of the drum 1 is closed by a plate 11, and the opposite end is open, but is provided with a ring 25 having bearing surfaces 37, 38 which co-act with similar surfaces 35, 36 on a fixed plate 12 which closes the side of the drum. The shaft 2 can be adjusted by a nut 40 in its bearing 41, so as to enable the bearing-surfaces to be properly adjusted to prevent any of the beans falling out of the drum. A feed-hopper 14, a discharge opening 16, and a sampling-hole are provided in the plate 12 and can all be closed by suitable shutters. The electric heaters, which are wound upon spools 46 with helical grooves, are mounted in the annular chamber 32. There are four sets of heaters, having three spools in each joined up in multiple. The current is carried by brushes 61, 62, 63, 64 engaging rings 56, 57, 58, 59 on the side of the drum. A switch

#### 774. Eltz, V. Jan. 12.

##### Heating air and

##### liquids; heating by

##### electricity; thermostats.

Air or

liquids are heated

to a desired

temperature by an

electric current

passed through a

coil c. The cover

of the heating-

chamber a has a

notch with two

terminals f, g in

the electric circuit.

The circuit

between these terminals

is made and broken,

to regulate the temperature,

by a piston k carried

by a spindle h on a float i

operated by liquid in a tube

q inside the chamber a.

The descent of the piston

k below the terminals is

prevented by projections s.

A cover p with a handle is

provided. A spring

interrupter may be used to

open and close the circuit

sharply. In this case, a long

float, half immersed in the

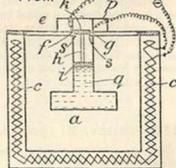
liquid, is used, and the piston

k carries a rod and a button

normally below a spring

which does not give until a

#### FIG. 1.

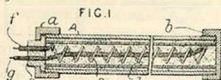


In another modification, as the temperature rises, additional resistances are placed in circuit, the piston *k* sliding in contact with a continuous contact at one side and a series of contacts at the other side. The contacts may be adjusted to vary the temperature.

**951. Wise, W. L.,** [May, L. von]. Jan. 14.

*Heating liquids.*—Petroleum and hydrocarbons and their distillates and derivatives are heated or cooled, for purposes of purifying, degasifying, distilling, &c., by means of appliances such as are described in Specification No. 11,217, A.D. 1902. The raw material may be successively passed through a series of such appliances arranged at suitable temperatures to effect the separation of the carburetted hydrogen, benzene, lighting and lubricating oils, and the residual paraffin.

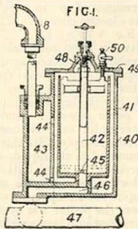
**1032. Whittingham, G. H.** Jan. 21, A.D. 1902, [date applied for under Patents Act, A.D. 1901].



*Heating by electricity.*—A resistant wire helix B is connected at its ends, and at intermediate points if desired, to conducting-wires *f, g*, covered with asbestos or other fireproof insulating-material. These are brought through the helix to one end, and passed through holes in a porcelain or other insulating-plug *c*, which is held between a screw cap *a* and one end of a metal tube *d*. A tube *d* of glass, porcelain, or other insulating-material is placed on the helix, within the metal tube, the spaces are filled with sand, and the metal tube is closed by a second screw cap *b*. The appliance is used as a heater or radiator.

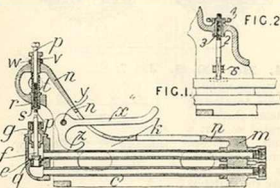
**1116. Milne, S.** Jan. 16.

*Steam traps.*—The chamber 40 contains an open float 41 held in a central position by a pipe 42 having a series of holes 45, which, when the float is in its lowest position, are left uncovered to allow any water within the float to flow into the passage 46 and thence into the waste pipe 47. The condensed water enters the small chamber 43 and passes through openings 44 into the chamber 40, where it accumulates and causes



the float to rise and cover the holes 45. Further ingress of water causes an overflow over the top of the float, which is thus depressed until the holes 45 are uncovered, the water within the float then flowing away through the passage 46. An air-escape valve 43, which also acts as a bye-pass in case of the float sticking, is fitted in the cover 49.

**1160. Berry, C. H.** Jan. 16.

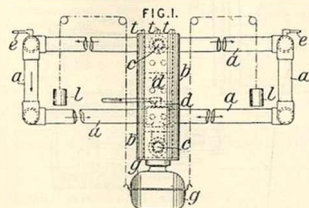


*Steam traps.*—An expansion steam trap, which can be adjusted by hand for different temperatures and allows a blow-through, comprises an inlet tube *c* and an outlet tube *k* connected to a valve-chest *g*. The spindle *f* of the valve *e* extends through a stuffing-box *g*, and is held down, when the tube *c* is full of steam, by a rod *p* adjustable in a flanged bush *r* pressed down by a spring *t*. The compression of this spring is adjusted by a bush *v* screwed into a frame *n* carrying a thick end piece *m*, to which the tubes *c, k* are secured. Lock-nuts *s, w* are provided. The valve can be made to open at will by depressing a lever *x* pivoted at *y* and carrying a cam part *z*, or by turning a hand-wheel 4 on a screwed bush 3 engaging a rod 2 passing through a guide 6, which rod may have a broadened end or be provided with a washer. According to the Provisional Specification, the valve-stem or a tube from the inlet chamber is connected to the stop by a U-tube, so that the tube tends to press the stop away against the action of a spring. This tube may be replaced by a diaphragm acted on by the steam or water pressure in the inlet chamber of the valve.

**1209. Riding, J. F.** Jan. 17.

*Heating buildings &c.*—Relates to heating and humidifying apparatus for greenhouses, dwelling-houses, cotton mills, and other places where heat or moisture is required. An endless range of piping *a* is connected to the hollow vertical cylinder *b* by top and bottom branch pipes *c*. The cylinder *b* may have cross water tubes *d*, or central vertical water tubes connected to top and bottom cross-tubes, and the water in the cylinder may be heated in any suitable way, as by an oil lamp *g* balanced by the weights *l* and suspended under the cylinder. Water is supplied from a tank

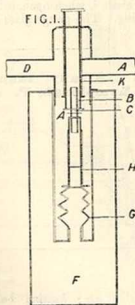
or cistern, and overflow pipes *e* to the cistern are provided. Two or more cylinders *b* may be connected up by lengths of piping *a*. For moistening



the air, an open vessel containing water may be placed on the top of the heater, or the projections *t* may be fitted with nozzles which may be opened to allow steam to escape.

**1276. Clark, W. R.** Jan. 19.

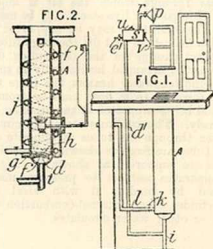
*Thermostats.*—A heat regulator, for regulating the supply of gas, steam, or hot water to warming-apparatus for buildings and vehicles, consists of the hollow plug *B* into which the inlet pipe *A* opens, the sliding tube *H* and bellows *G* that govern the escape opening *C* to the outlet *D*, and the chamber *F* which contains gas to operate the bellows *G* by its expansion and contraction. The mean or desired supply of fluid is controlled by raising or lowering the tube *K*.



**1434. Randall, J. O.** March 3, A.D. 1902.  
[date applied for under Patents Act, A.D. 1901].

*Heating buildings.*—Relates to the heating and ventilation of buildings, and consists in arranging within or below the room to be heated or ventilated one or more heating-cylinders *A* together with the air pipes *l*, *d*<sup>1</sup> to the outer air and room respectively. The heater *A*, Fig. 2, is double-walled, and the pipe *j* is arranged within the space between the walls. The inner lower wall *d* has grooves *h* in its upper surface and perforations *g* in its periphery, and the space *f* below the wall or partition *d* is connected with the drip pipe *i*, to which is

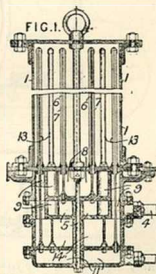
attached the pipe *d*<sup>1</sup> supplying air from the room through the funnel *p* and the purifying water tank *s*. Dampers *k*, *r* are provided in the air pipes. Dust and other impurities are carried into



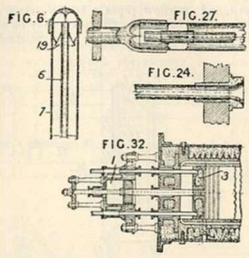
the tank *s*, which has a gauge glass *v*, an outlet pipe *e*, and an inlet *u*. A gasoline or other suitable burner heats the air, fresh air passing round the spiral pipe *j* and air from the room direct to the central tube of the heater.

**1456. Pinckney, P.** Jan. 21.

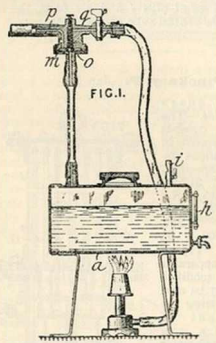
*Heating gases and liquids.*—The invention consists of improvements in the inventions described in Specifications No. 21,521, A.D. 1895, No. 22,310, A.D. 1897, and No. 22,259, A.D. 1900. It comprises (1) a surface-apparatus which, in modified forms, may be used for recovering the latent heat of steam, as a condenser, feed-water heater, and heater and cooler for gases and liquids in general; (2) a hot-air engine; (3) a centrifugal separator for gases; (4) a gas engine (1 and 2). Figs. 1 and 6 show the surface-apparatus as used for heating highly-compressed air by the latent heat of exhaust steam for use in an air engine and for cooling the exhaust air. The air circulates through the vessel 1, and steam admitted by a pipe 4 to the chamber 5 ascends the small tubes 6, while the water of condensation descends the surrounding tubes 7 into the chamber 8. Similarly, cooling-water traverses another set of tubes 9, 13



from the chamber 11 to the chamber 14. The heads of the outer tubes are constructed as shown in Fig. 6, while the inner tubes are supported at their upper end by a cone 19. A number of pieces of apparatus with a few tubes may be fixed to a single plate through which the air is supplied to them. Hot gases or live steam may be used for heating. The small tube may be supported by a sleeve with a helical rib that fits the large tube and forms a spiral passage for the descending water. The tube may be arranged horizontally in surface condensers and feedwater heaters, the large tubes projecting inwards from both ends or from one end only and being supported at the other so as to expand freely. The cooling-water may circulate in succession through the tubes at opposite ends. The small tubes are fixed as shown in Fig. 24, and both tubes are supported as shown in Fig. 27. All the apparatus subject to pressure may be strengthened by binding it with steel wire. (4) The cylinder of an internal-combustion engine, Fig. 32, contains two free pistons 3 through which boiler-feed or other water circulates.



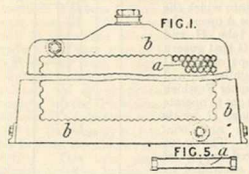
1504. Schweder, M. Jan. 21.



*Heating liquids; boiling-pans; digesters &c.*—Relates to the automatic regulation of gas burners for heating cooking vessels or boilers which, suitably shaped, may be utilized for industrial purposes, for example, for glue-boiling or resin-melting. The pressure in the steamtight vessel *a* acts upon the diaphragm *m*, to one side of which the throttle valve *o* is connected, the valve being loaded by an adjustable spring. Upon the pressure in the vessel rising, the valve is correspondingly closed and the supply of gas along the passage *p*, *q* checked. A slot in the valve *o* permits of the passage of gas when the valve is pressed upon its

seat. In a modified vessel, the space between the inner and outer shells may be enclosed and the pressure therein employed for actuating the valve. The whistle *i*, when open, indicates that the liquid is boiling. The gauge glass *h* may be provided.

1596. Albany Manufacturing Co. and Lamplough, F. Jan. 22.



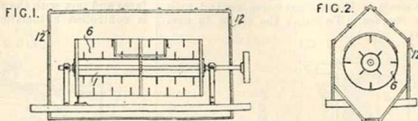
*Heating air; heating buildings.*—Relates to apparatus for cooling and condensing, applicable also as a radiator in which air is heated by steam or hot water. The enlarged ends of a number of tubes *a* are forced into hexagonal or other forms such as can fill the whole of a plane, leaving no intermediate spaces. The tubes may also be stamped into heavy longitudinal flutes. The hexagonal ends are placed in contact and brazed or soldered together into a block of a suitable shape. They are then fitted into the back and front of the tank or casing *b*, the metal of which is cut out to fit them tightly, the joints being brazed or soldered.

1717. **Doull, J.** Jan. 23.

*Heating by electricity.*

—Materials which clog or matt under compression and other substances are dried by hot air or electricity in the rotating apparatus shown in Figs. 1 and 2. Two concentric rotating cylinders 1, 6 are

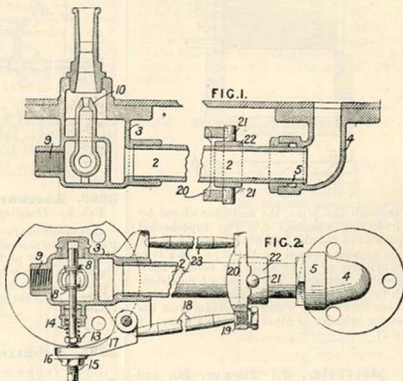
mounted upon hollow trunnions. Electrical currents are passed through suitable brushes to the metal-work of the cylinders, the outer of which is perforated, and contains the materials to be dried.



1993. **Brooke, R. G.** Jan. 27.

*Thermostats.* — Relates

to thermo regulating apparatus for automatically controlling the temperature of liquids in tanks, pipes, or other receptacles, for controlling the flow of fluids through pipes or other conduits, or for controlling the position of dampers in the flues of water-heating apparatus. A double-beat valve 8, controlling the passage of steam from an inlet 9 to a nozzle 10, is closed by a spring 14 and opened by a lever 17 operated by rods 18, 23 and a lever 20 bearing against pins 21 on a collar 22. This collar is carried by an expansion tube 2 secured to the valve casing 3 and passing through a stuffing-box 5 on a junction pipe 4. The steam heats the water in the tank, and induces a current through the expansion tube. Screws 15, 19 and nuts 13, 16 are provided, as shown. In a modification, the steam and water passages in the valve casing are independent of one another, and the valve is opened by steam pressure when the closing-lever is lifted against the action of a spring. One end of the expansion tube may be closed. A butterfly valve in a length of piping may be connected by a pin and slot to the valve-operating lever, and an air valve may be provided at the top. The damper



of the boiler flue of a hot-water circulating-apparatus may be connected by rods and levers to the lever 17. In another modification, the links 18, 23 are pivoted at their ends, and the pins 21 are arranged on the inner side of the lever 20, springs being arranged on each side of the lever 17. Specification No. 137, A.D. 1903, [Abridgment Class Steam generators], which describes apparatus for automatically controlling the supply of water to steam boilers, is referred to.

2402. **Bruun, J. F. A.** Jan. 31.

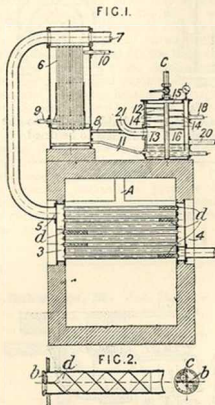
*Heating liquids; heating by steam circulation.*—

Relates to a method of and apparatus for utilizing exhaust steam from steam engines for heating

feedwater, or for boiling, heating, or like purposes. The exhaust steam is first superheated by passing it through pipes 3, 4, 5 arranged in a chamber A into which hot combustion products are passed. The number of pipes in each series gradually



increases to allow for the expansion of the steam, and the pipes are fitted with spiral plates *d* to cause the steam to have an extensive contact with the pipe surface. To cause the steam to pass



slowly through the pipes, the ends are closed by plugs *b* having openings *c*. The superheated steam passes to a tubular feedwater heater 6, 9, 10, a portion passing onward by the pipe 7 to a low-pressure cylinder or to be used for boiling, heating, and other purposes. The water of condensation and the uncondensed steam pass by pipes 11, 8 to a jet condenser C, to which the steam from the low-pressure cylinder or other apparatus passes by the pipe 21.

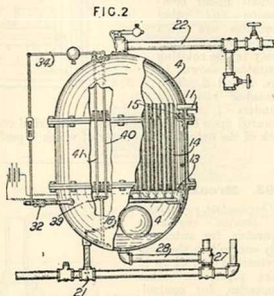
**2451. Batcheler, J., Turner, H., and Vapour Preventer, Ltd.** Feb. 2. *Drawings to Specification.*

*Heating by electricity.*—A box contains a grid or spiral, composed of graphite paste or other material, through which current may be passed for heating air. The hot air is collected by a conical tube and carried to a horizontal perforated tube situated below a window, to prevent deposition of moisture thereon.

**2601. Curtis, N.** Feb. 3.

*Thermostats.*—In a steam boiler heated partly by direct contact of the products of combustion, the gaseous or liquid fuel burners are situated in the lower part of a vertical double egg-ended boiler 4 under a water dish 13 from which fire tubes 14 rise through an upper dish 15, whence

the water flows down outside the tubes. The products of combustion play upon the water surfaces and mix with the steam. The supply of fuel is controlled automatically by the temperature,



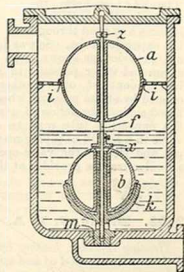
the lever 34 for opening and closing a cock 32 being connected by an expansible link 41 to a lever 39 inside the boiler, against which also an expansible strut 40 abuts.

**2859. Roeckner, F. L., and Norris, W. J.** Feb. 6. *Drawings to Specification.*

*Non-conducting coverings and compositions.*—Paper pulp is compressed into sheets, with or without wire netting or perforated or expanded metal, and the sheets are available as linings for refrigerating-chambers. The same material is made into pipes and half-pipes for covering steam and cooling-pipes.

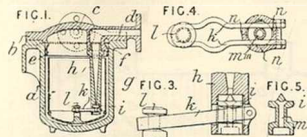
**2887. Schütze, P.** Feb. 6.

*Steam traps.*—The steam trap is provided with an upper and large float part *a*, which is loose on the float spindle *f*, and with a lower and smaller float part *b*, which is preferably loose on the spindle *f* and is surrounded by the cup *k* connected to the valve seat *m*. Stops *z*, *x* for the floats *a*, *b* are fixed on the valve spindle, and a seat *i* is provided for the upper float, while the



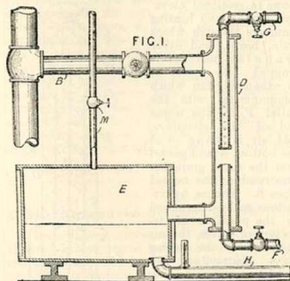
lower float is held up by the water retained in the cup *k*.

**3133. Warriner, R.** Feb. 10.



*Steam traps.*—A valve *i* at the bottom end of the discharge pipe *h* is operated by a float *g* placed in a vessel *a*, into which the water of condensation passes. The flanged cover *b*, having an inlet *c*, and an outlet *d* connected to the pipe *h*, forms with the sides of the vessel *a* an annular space *f*. The valve *i*, shown enlarged in Figs. 3, 4, and 5, has a central passage *m*, and is operated through a bifurcated lever *k*, pivoted at one end to the pipe *h* and connected at the other end to a stud *l*. Water of condensation, entering by the inlet *c* and annular space *f*, at first lifts the float, closing the valve *i*. As the water accumulates, it flows over the sides of the float *g*, which is open at the top, causing it in time to sink and open the valve *i*. Recesses *n* are formed in the lower end of the pipe *h* around the valve *i*.

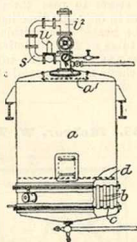
**3139. Watts, I.** Feb. 10.



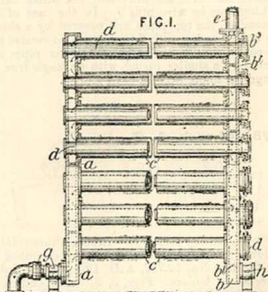
*Heating water.*—Exhaust or other steam brought by a pipe *B* commingles in a cylinder *D* with cold water from a perforated pipe *G* and condensed water from a pipe *F*. The resulting hot water accumulates in a chamber *E* with a vent pipe *M*, and is pumped away through a pipe *H*. As a modification, no condensed water is supplied, and the pump is replaced by a float valve in the chamber.

**3150. Smith, W. R., and Scott, E. G.** Feb. 10.

*Heating liquids.*—In the extraction of fatty matters from bones &c. by means of volatile solvents, the material to be treated is placed upon the grating *d* in the extractor *a*, solvent supplied from a tank is sprayed evenly over it, by admission through the perforated splash plate *a'*, until the solvent fills the lower part of the extractor up to the level of the grating *d*. Heat is applied by means of the steam chest *c* through which pass a series of vertical tubes *b*. The solvent vaporized is condensed and returned to the tank. A by-pass *s* provided with a safety-valve *u* is connected to the pipe *r* around the valve.



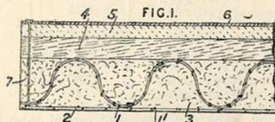
**3296. Bennett, J. E., and Bennett, J. E.** Feb. 11.



*Heating liquids.*—Relates to tubular apparatus for heating, refrigerating, distilling, condensing, and concentrating liquids, &c. The two vertical or inclined end chests *a*, *b*, Fig. 1, are united by horizontal tubes *c* which are s'capped thereinto and connect the interiors of the chests. Through these tubes, smaller tubes *d* pass from the outer face of the one chest to the outer face of the other, being flanged *d* and bolted to the chest *a*. At the opposite end of the tube, a stuffing-box *b'* permits expansion and contraction. Steam or other heating-fluid is admitted by a pipe *e* and passes out by the trunnion *g*; or, by using a second trunnion *h* for admission, the set of tubes can be rotated to

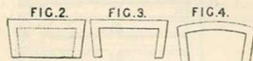
any inclined position. Stops  $b^1$  may be placed in the chests between alternate pairs of tubes to cause the steam to pass through adjacent horizontal tubes in opposite directions. The liquid which is to be heated flows within the tubes  $d$  and about the tubes  $c$ ; and the active fluid passes inside the tubes  $c$  and around the tubes  $d$ . In other forms, the chests are horizontal and the tubes vertical.

3533. McIvor, W. T. Feb. 14.



*Non-conducting coverings.*—A non-conducting covering for heat radiating or absorbing surfaces, fuel economizers, or cold-storage rooms, consists of slabs each having a corrugated sheet 1 secured to a flat sheet 1<sup>1</sup> of wire netting and packed with flocculent silicate cotton 3. Layers of asbestos paper 2, hair felt 4, papier mâché 5, and thin oil-cloth or canvas 6 are provided, the whole being held together by wire pins 7. In the case of an economizer, the top pipes are covered by a sheet-iron box or casing with flanged ends to receive the non-conducting layer, while the lower pipes are covered by a similar casing with an angle-iron to engage the upper lip of a fixed Z-iron.

3678. Church, A. T. Feb. 17.

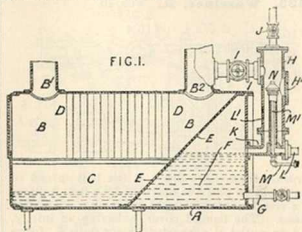


*Non-conducting coverings.*—Bricks, either solid or hollow, made of the composition described in Specification No. 12,737, A.D. 1901, are applied to cover steam boilers. Figs. 2, 3, 4 are end elevations of hollow bricks for the purpose; Fig. 2 represents a brick with closed ends, and Figs. 3 and 4 show bricks with open ends. The bricks are laid, pointed, and finished off as in ordinary brick-laying.

3738. Roberts, G. I. Feb. 17.

*Heating water.*—Relates to an apparatus for heating feedwater and for extracting grease and water from exhaust steam. A water-heating compartment H is provided, in which the returns from house-heating, condensation, and other water, and steam from the trap or live steam of higher pressure are mixed together. A shell A, having a

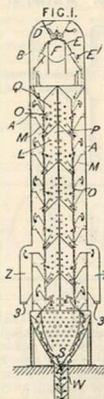
steam inlet B<sup>1</sup> and outlet B<sup>2</sup>, has a grease-extracting compartment B with the usual baffles D and a lower part C to receive the extraneous oil, water, grease, and other foreign matter. An inclined



partition E separates a chamber F for receiving the return waters and condensations and having a discharge pipe G and an inlet pipe K. The latter forms the discharge pipe of a water-heating chamber H, to which the admission of exhaust and live steam is controlled by valves I and J respectively. Drips and water of condensation are led by a pipe L, and other water by a pipe M, to concentric pipes L<sup>1</sup>, M<sup>1</sup> surmounted by three centrally-perforated distributing-caps N. A handhole plate H<sup>1</sup> is provided.

3872. Horner, R. Feb. 18.

*Heating air.*—Fig. 1 shows in sectional elevation drying and heating chambers through which grain, beans, and other granular material is dropped. By means of an exhausting fan which communicates with the outlet F at the upper end of the chambers, cold air is drawn in at the bottom W and passed over the dried grain before reaching the heated pipes S. Thence, by circuitous paths determined by the positions of deflectors or valves, the air passes over the falling grain, abstracting its moisture, and traverses the surfaces of the heating-pipes Q. The trunks A on each side of the central air-heating chamber are fitted with valves and deflectors M, O, some of which are hinged. They are arranged to permit the descent of



thin streams of grain between them and the walls of the inner chamber. The arrangement of the valves also prevents the direct ascent of the air employed in the drying. The middle chamber L is divided into compartments by partitions P which compel the air in its ascent to assume a circuitous path.

### 3873. Le Roy, F. Feb. 18.

*Heating by electricity.*—Resistances and coils for electric heating are wound in the thread of a screw formed in a rod *c*, Fig. 6, of fireclay or other suitable insulating material and covered by a tube *e* of similar material, the outside of which is provided with ribs *h* for dispersing the heat. The ends of the tube are fitted with metal caps *g* to which the ends of the coil are attached. Both rod and tube may be screwed as in Fig. 7, or the rod may be grooved longitudinally. Both ends of the coil may be brought to one end of the tube, in which case a cap similar to that of an electric

lamp is used at that end. If the heat is required on one side only, the ribs of the outer tube may be confined to that side as shown in section in

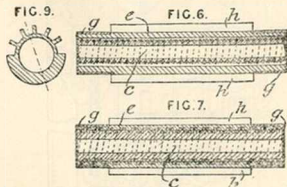
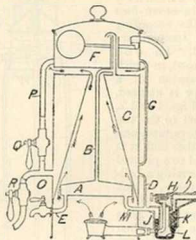


Fig. 9. When a greater quantity of heat is required, the wire may be wound double or treble, as this is stated to be preferable to using a thicker wire.

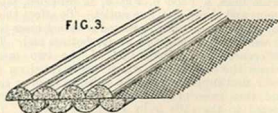
### 4029. Claughtons, Ltd., and Austin, E. Feb. 20.

*Heating water.*—In an apparatus for heating a given quantity of water to any desired temperature and storing it so as to be available for immediate use, the quantity of gas supplied to the burner, when using a gas burner, is regulated automatically according to the amount of water used. The gas or other burner heats the part A of the boiler. The hot water passes through a tube B to the storage part C, which is connected by a tube G with the cold-water storage cistern F. The cold water passes to the part A through tubes D, M. Valve outlet pipes E, O, P are provided, the temperature of the water passing through the cock R being controlled by the amount of cold water passing through the cock Q. The gas regulator H consists of two vessels J, K connected together by a siphon tube L and containing mercury which, when the boiler is full of water, closes the depending end of the gas pipe I. A small screw bye-pass valve is shown. When mercury is not used, the vessel K extends the full height of the boiler and the gas pipe dips into water.

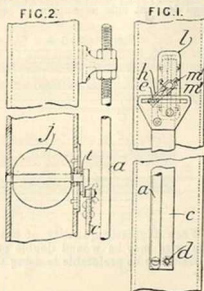


### 4064. Justus [née Godecke], J. Feb. 20.

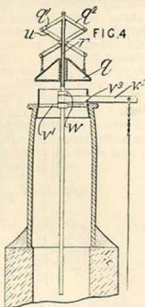
*Non-conducting coverings.*—Kieselguhr or similar material is compressed into segmental bars which are laid closely side by side and attached on their flat sides, by pressure or by adhesives, to a flexible foundation, such as wire fabric. The other side of the foundation may be covered with a coating of the insulating material; or both sides may be covered with bars of the material, arranged alternately, as shown.



## 4081. Barry, H. A. L. Feb. 20.



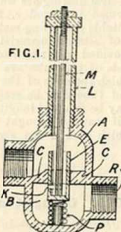
*Thermostats &c.*—Relates to means for automatically regulating the chimney draught in stove fires or the like according to the temperature produced. In one arrangement, in which the expansion of a stove pipe is utilized, a rod *a*, Figs. 1 and 2, is attached to the top of the stove pipe, and at the other end it is connected to a pivoted plate *c* forming a bell-crank lever *c*, which is journaled at *d*. The lever *c* is thus caused to turn when the stove pipe expands or contracts, for the rod *a* is moved with it. The lever *c* is fitted at the top with an adjustable pin *e* which engages the slotted damper lever *h*. Stops *m*, *m*<sup>1</sup> are fitted to the cover *l*, to limit the movement of the damper. In the case of stoves with brick flues, a hood *g*, Fig. 4, is provided, which opens and closes the flue outlet. To effect this, a copper or brass rod *r* is placed within a brass tube to which it is connected at its bottom end. The difference in the expansion of the two metals causes the levers *q*<sup>1</sup>, *q*<sup>2</sup>, which are pivoted on the rod *r*, and supported on the tube, to open or close and thus raise or lower the hood, which is connected to the rods *u* by means of chains. The tube is supported and guided by the cross-piece *v*<sup>1</sup>. To adjust the hood by hand, a lever *v*<sup>2</sup> is mounted upon a fulcrum *v*<sup>3</sup> and engages at one end with a collar *w* upon the tube. A chain is attached to the other end of the lever for raising or lowering



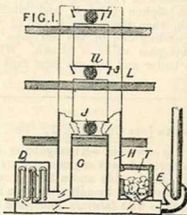
it. Another modification consists of a butterfly valve which is suspended in the flue by means of an iron rod, the flaps of the valve being actuated by the aid of two brass or copper rods which are attached to the upper end of the iron rod.

## 4126. Wright, G. E., and McNeill, D. R. Feb. 21.

*Thermostats.*—The inlet and outlet chambers *A*, *B* of a valve are separated by a diaphragm *C*, in which slides a cylinder *E* open at one end and closed at the other, and having also a saw-cut *K*. This cylinder is pressed by a spring *P* against a rod *M* adjustably attached to the end of a tube *L* fixed on the top of the valve. This tube *L* expands sensibly under the action of heat, but the rod *M* does not, being an alloy of 36 per cent. nickel and 64 per cent. iron, with the result, therefore, that if the temperature rises sufficiently, the saw-cut *K* is drawn into the diaphragm *C* and the valve closed, to open again when the temperature falls. Lever or other multiplying gear may be placed between the cylinder *E* and rod *M*. The apparatus may be applied to a switch.

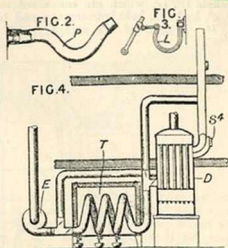


## 4347. Titus, J., and Titus, W. Feb. 24.



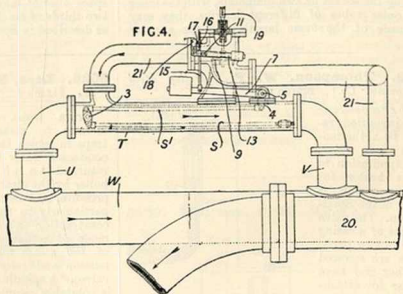
*Heating buildings.*—Heated air, cooled air, or air at ordinary temperature, or any desired mixtures of these, are supplied by the apparatus shown to the various floors of a hospital or other building. In the arrangements shown in Fig. 1, *G* is a hot-air shaft and *H* a cool or cold air shaft, *D* being a

heater and T a refrigerator. The two shafts are connected together at each floor by passages I, from which gratings J open into the rooms. At the extremities of the passages I are valves, which are connected together by rods *u* so as to be simultaneously operated to adjust the proportions of air coming from the respective shafts; they may be operated automatically by a thermostat L, as shown in Fig. 3. Flexible tubes P, Fig. 2, may conduct the air from the openings J to any desired place. By suitably manipulating the valves shown, the air supplied by the fan E may be entirely, or in part, passed through the heater or the refrigerator, or taken direct to the rooms through the shaft H. Fig. 4 shows a modified arrangement, in which the air delivered to the rooms at *s'* is passed through the refrigerator T or the heater D, or through both. In the last case, the object of the cooling is to deposit moisture.



4541. Sugden, T. Feb. 26.

*Thermostats.*—The maximum temperature of superheated steam is limited by the device shown. A branch U, V is connected to the pipe W conveying the superheated steam and contains two expanding and contracting rods or tubes S, S' connected to a lever pivoted at 3. The rod S is fixed at one end while the rod S' is connected to a lever 4 on a spindle 5 carrying a weighted lever 7. This lever carries a rod 15 with an adjustable nut 16 to engage a weighted lever 13 on a spindle 11 carrying the operating-lever of a valve 9 arranged in a pipe 21, which connects the pipe T with the pipe 20 through which the wet steam passes. A pointer 17 and an adjustable scale 18 may be provided to indicate the



temperature of the steam. A whistle 19 may be controlled by the valve spindle.

4832. Bennett, F. E. March 2.

*Heating liquids.*—Relates to surface apparatus for effecting the transference or exchange of heat between fluids. The apparatus in its general construction is similar to that described in Specification No. 6146, A.D. 1901, and the object of the present invention is to facilitate its construction and to allow the tubes to be taken apart for cleaning. The apparatus consists of two pairs of concentric tubes *a*<sup>1</sup>, *a*<sup>2</sup>, Fig. 1, enclosing between them annular spaces *b*<sup>1</sup>, *b*<sup>2</sup>, through which the liquid to be heated passes. The ends of the tubes are sweated into the sockets *a*<sup>1</sup>, *a*<sup>2</sup>, and the spaces *b*<sup>1</sup>, *b*<sup>2</sup> are in connection with

the inlet or outlet passages *f*<sup>1</sup>, *f*<sup>2</sup>, by means of the circumferential passages *e*<sup>1</sup>, *e*<sup>2</sup>. The inlet connection consists of a tubular plug G, which screws into the branch F<sup>2</sup> and the pipe *c*, and thus keeps the tubes in position. The heating-liquid or liquid to be heated flows in through the openings shown in the plug, when the plug G is open at the end, and passes into the annular spaces *b*<sup>1</sup>, *b*<sup>2</sup>. If the liquid enters through a pipe at the top, the end of the plug is closed, and the branch F<sup>1</sup>, instead of being made as shown at *f*, is extended upwards as at H<sup>1</sup>. In the arrangement shown in Fig. 3, the inlet pipe is in direct communication with the interior of the

sockets  $D^1, D^2$ , which are connected to the tubes  $a^1, a^2$ , by being held between top and bottom nuts  $k^1, k^2$ . Instead of the sockets being applied to

enclose and connect with the vapour spaces, they may be applied to enclose and connect with the liquid spaces. In another arrangement, instead of

FIG. 1.

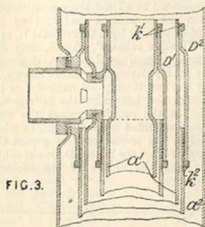
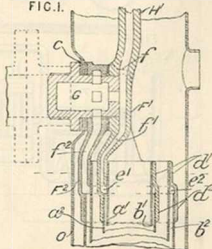


FIG. 3.

making the socket of two diameters, with the inner and outer tubes of different lengths, they may be made of the same length, and the annular

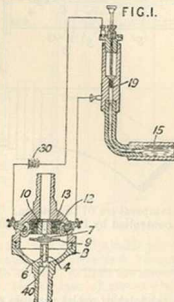
space  $b^1$  or  $b^2$  may be closed at the end to about two-thirds of its circuit by a segmental filling-piece as described in Specification No. 6146, A.D. 1901.

**4963. Thompson, W. P.,** [*Holley Heat Regulator Co.*]. March 3.

*Thermostats.*—

The invention relates to a thermostatic gas valve. The application to a gas heater for melting metals is stated in the Specification. The valve consists of a casing made in two parts, which are screwed together and have nipples for attachment to gas pipes. The lower part B has a guiding-socket 4 for a valve spindle 6, the socket being provided with holes 40 for the passage of gas. The spindle carries a valve 7, preferably made of some soft material, and also a disc 9 which forms the armature of an electromagnet carried by the upper part of the casing. A central hole through the core 10 of the magnet forms a passage for the gas, and the magnet is also surrounded by a jacket 12, made of magnetic metal, the core and jacket being connected by a plate 13. The magnet is energized by a battery 30 controlled by a device consisting of a chamber 15 containing mercury or the like, which makes electric contact with an adjustable screw 19 when the temperature rises.

FIG. 1.

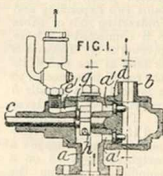


**5026. Lees, W., Lees, T. W., and Lees, A.** March 4.

*Steam traps.*—

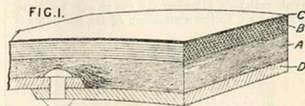
Relates to steam traps in which the condensed water is returned to the boiler by the steam pressure, and more particularly to the construction and mode of actuation of the steam admission and relief valves. A spindle  $c$  is rotatably mounted in a casing over the body of the steam trap, and is actuated by a float. Valve discs  $d$  are carried on the ends of a double arm set on the spindle; another valve disc  $g$  is similarly mounted on a lever  $h$ . These discs respectively control the steam-admission ports  $a^1$  and the relief port  $e^1$ . When the condensation water in the trap is below a certain level, the float holds the steam ports  $a^1$  closed, and the relief port, which is in connection with a check valve serving to prevent condensed water from re-entering the casing, is held open so that the pressure is relieved by the escape of steam. When the water rises high enough, the valves are reversed, and steam from the boiler enters the trap through the opening  $b$  and the ports  $a^1$ , and drives the condensed water back to the boiler. The movement of the valves is limited by stops.

FIG. 1.



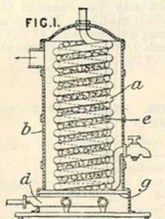
## 5090. Barratt, S. H. H., and United Asbestos Co. March 5.

*Non-conducting coverings.*—A non-conducting covering for boilers, tanks, pipes, &c. has a soft inner layer A of silicate cotton or asbestos fibre in the form of wadding or loosely-woven material, which readily adapts itself to rivet heads, plate joints, and other irregularities. The outer covering B consists of corrugated asbestos paper or millboard, with a backing C of canvas or asbestos cloth made waterproof by painting or varnishing, or by the application of metal sheeting.



## 5156. Gill, F. E. March 5.

*Heating water.*—A bath geyser or similar apparatus, heated by an atmospheric gas burner *d*, has pieces of asbestos, firebrick, or other refractory material *e* packed in the space bounded by the horizontal, vertical, or inclined water coils *a*. A supporting-grate *g* is arranged near the bottom of the casing *b*.



through a tube *b'*, Fig. 1, containing loose packing *c* and closed at the ends by perforated caps *m*, *n*. The capillary passages in the packing causes the condensation of any steam which tends to escape to the outlet. The arrangement also allows air to enter the apparatus for the purpose of preventing a vacuum. The tube *b'* is inserted in an outer tube *a*, connected with the apparatus, and is held in place by a spring *f* bearing against the cap *m*. A mud box *h* is provided at the inlet end of the tube *a*. In a simpler arrangement, Fig. 13, the inner tube *b'* is dispensed with, the packing being placed in the outer tube *a*. The packing may consist of small balls, or other shaped particles, or of rods, strips, plates, or the like, arranged longitudinally in the tube. In the latter case, the plates or strips are provided with lugs in order to separate them slightly. A small central passage may be left to facilitate the flow of water &c. Figs. 5 to 12 show in end section the various forms and arrangements of packing.

## 5311. Martini, C. H. March 6.

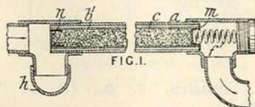


FIG. 1.

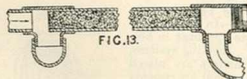


FIG. 13.

FIG. 5. FIG. 6. FIG. 7. FIG. 8.

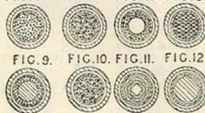
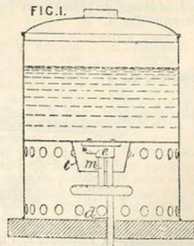


FIG. 9. FIG. 10. FIG. 11. FIG. 12.

*Steam traps.*—The condensed steam of steam-heating, cooking, and like apparatus, drains

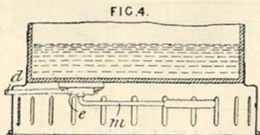
## 5429. Hearson, C. E. March 9.



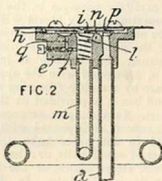
*Thermostats.*—In a thermostatic arrangement, applicable to gas-heated apparatus, an expansible and collapsible case or capsule, containing a liquid which boils at about the required temperature, is arranged in a chamber in a metal block, through which the gas passes, so that, when heated above



a certain limit, the capsule expands, and directly obstructs the passage of the gas. On cooling, the capsule collapses, allowing the gas to pass freely to the burners. Entire extinction of the gas flame is



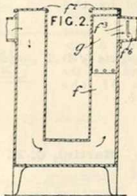
prevented by a bye-pass. Two arrangements of the apparatus, as applied to liquid-heaters, are shown. In a block *e*, attached to the base of the water vessel or boiler is formed a chamber *h*, containing the capsule *i*, which may be of the kind described in Specification No. 5141, A.D. 1881, and is faced with a layer of cardboard, or other slightly-compressible material. A valve seat *n* is formed in a passage *l*, which connects the chamber *h* to the outlet pipe *m*, and contains a spring arranged between the mouth of the pipe *m* and the capsule *i*. A channel *p* in the bottom of the chamber *h* allows communication between the inlet pipe *d* and the passages *g*, *r*, leading to the outlet pipe *m*, so as to form a bye-pass. The whole apparatus may be protected from the direct heat of the burner by a shield *t*, Fig. 1, or it may be placed away from the burner, as shown in Fig. 4.



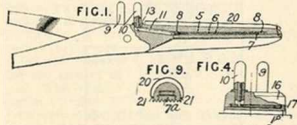
shown at 7<sup>o</sup>. Fig. 9, and is slid into place longitudinally. It may be secured in position by soft solder having a melting point sufficiently low not to interfere with the temper of the steel. The strip 5 is connected at its ends to copper terminals 8 one of which is in contact with the jaw of the forceps and so with the terminals 9; the other is connected by an insulated conductor 11 to the terminal 10 which is insulated from the forceps by a plug 13. The surrounding tissues are protected from the heated jaws by a shield 20 which has spurs 21 sprung into notches or recesses in the jaw. The conductor 11 may pass along the handle of the forceps, being contained in a tunnel formed by a groove covered over by a bevelled piece like the piece 7. Fig. 4 shows a heating-appliance which may be connected to an instrument not specially modified. It consists of a block 16 containing a heating strip 17 and furnished with terminals 9, 10. It is grooved at 18 to fit on to one jaw of the forceps.

**5609. Martin, G. I., and Martin, J. H.**  
March 10.

*Heating buildings &c.*—The products of combustion from a stove are circulated through a radiator *f*, Fig. 2, made in the form shown and provided with removable cover-plates *f'* and also with a hood *g* for concentrating the smoke &c. into the outlet *f''*, which is provided with a damper *f'''* for regulating the draught.



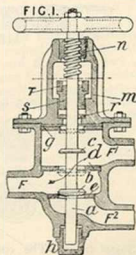
**5606. Downes, A. J.** March 10.



*Heating by electricity.*—A resistance 5, Fig. 1, of platinum &c. is contained in one jaw of a pair of surgical forceps, or the like, from which it is insulated except at the end by mica or other insulating strips 6. When a current is passed through it, it heats the whole jaw of the forceps. It is covered in by a piece 7 which forms one of the acting surfaces of the forceps. This piece has bevelled edges or is made with square lips, as

**5723. O'Brien, J. O.,** [Grasset, P.].  
March 12.

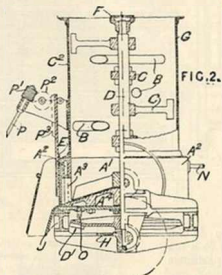
*Heating by water circulation.*—In order to regulate the heat in hot-water heating systems, the radiators are placed in the several apartments in branches from the main pipe, and three-way valves are used to control the passage of the water to the radiators. The use of the special valves enables heat to be utilized from any source whatever, such as domestic fires, bakers' ovens, or manufacturing and other furnaces. The valve shown in Fig. 1 is provided with a casing



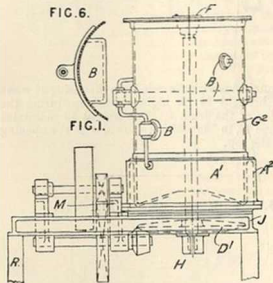


having one inlet passage  $F$ , and two outlet passages  $F^1$ ,  $F^2$ , either of which may be closed by the valve  $b$ , which can be brought against either of the seats  $d$ ,  $e$  screwed into the casing between the inlet and outlet passages. The valve spindle  $a$  is supported by a screw nut  $n$  carried in a bracket  $m$  bolted to the valve casing; a cap  $h$ , which screws into the casing, covers the lower end of the spindle. In order to facilitate the packing and lubrication of the valve without stopping the water-circulation, the gland  $s$  and the bottom ring  $r$  of the stuffing-box are divided along the axis, the upper end of the gland being embraced and drawn down by a bar  $T$  shaped like the top of an ordinary gland. During the process of re-packing, a second valve  $c$  on the spindle  $a$  is supported against a seat  $g$  to close the outlet to the gland. The seat  $g$  screws into the casing, and is set so that the valve  $c$  closes the passage above, when the valve  $b$  is against the upper seat  $d$ . In setting the seat  $g$ , the valve  $b$  is held up against the upper seat  $d$  by a wedge or prop placed in the cap  $h$ .

and by the footstep  $H$  attached to girders  $J$ , which support the heater on the frame  $R$ , and also carry cross girders  $M$  for the driving-train shown, which ends in a bevel-wheel  $D^1$  on the shaft with teeth



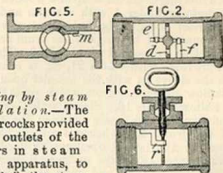
5990. **Middleton, R.** March 16.



*Heating by steam circulation.*—The base and lower part of the sides of a vertical mixing-apparatus for briquette-making materials containing pitch and the like, are steam-jacketed. Steam pockets and pipes also project across the vessel, between the stirring-knives. Steam enters the jacket  $A^2$ ,  $A^1$ ,  $A^3$ , Figs. 1 and 2, of the containing-vessel  $G^2$  by the pipe  $N$ , condensed water escaping by the pipe  $O$ . Above the jacket are the internal heating-arrangements  $B$ , consisting of cross tubes, close-ended projecting tubes, and pockets, Fig. 6, all receiving steam from T-shaped connections to vertical pipes, having an air escape valve at the top to assist initial circulation. The knives  $C$  on the shaft  $D$  may be removable with the pipes  $B$  in place, or the reverse, and bearings are furnished in a girder  $F$  across the open top

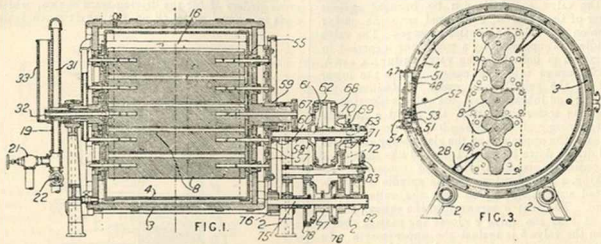
facing downwards. A small escape of steam through a gland round the shaft effects lubrication, and the lowest knife is immediately above the double bottom. Materials are fed in at the open top, and withdrawn through the aperture  $A^2$  regulated by the sliding door  $E$  with screw, worm-wheel and rack operating-gear  $P$ ,  $P^1$ ,  $P^2$ ,  $P^3$ .

6103. **Brukenhaus, R.** March 16.



*Heating by steam circulation.*—The valves or cocks provided at the outlets of the radiators in steam heating apparatus, to "throttle" the steam or condensed water, are constructed to facilitate the removal of solid particles, which may lodge in their openings. Fig. 2 shows an ordinary pivoted-disc valve with holes  $d$ , which may be cleared by turning the valve disc into the position shown in dotted lines until the holes engage pegs  $e$ ,  $f$ . Fig. 5 shows a plug cock, with a fixed projection  $m$  entering the opening in the plug, so that the latter is cleared every time it is turned. The projection  $m$  may be arranged to move round the plug. Fig. 6 shows a sliding valve with an opening, into which a finger  $r$  projects. In this case also, the finger may be made movable.

6137. Fairweather, W., [Complete Creamery Co.]. March 17.

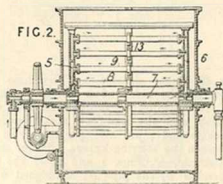


*Heating liquids.*

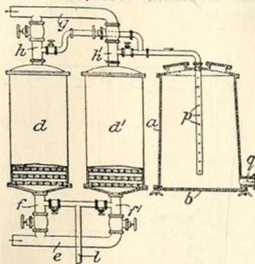
—Relates to a machine for pasteurizing, ripening, and churning cream, and for salting and working the butter, or for any one of these operations, and also for cooling or heating. Fig. 1 shows a longitudinal section and Fig. 3 a cross-section of the machine, Fig. 9 an enlarged view of the steam &c. pipe connection and Figs. 7 and 8 show details. The standards 2 support a rotating drum made up of a wooden jacket 3 and a metal cylinder 4 with a steam and water space between them. The fluted butter-working rolls 8 mounted in bearings in the drum are connected together by toothed wheels 57, 59. The inlet pipe 19, provided with valves 21, 22, is connected through the sleeve 24 with the annular opening 17 in the hollow gudgeon 6, from which pipes 28 lead to the hollow flights 16. Steam, water, or air is thus conveyed to the space between the farther ends of the drums 3, 4 whence it returns between the drums to the lateral openings 29 leading to the annular space 18, in the gudgeon 6, connected to the exit channel 30 and pipe 31. Cream is admitted to the drum through the supply pipe 33 and central passage 32. The flights 16 may be made open at both ends and the pipes 28 carried through them to discharge at their farther ends. Hollow rolls may be used instead of the solid rolls 8 in which case they are connected to the pipes 28 so that the heating or cooling fluid circulates through them. The door 48, secured in the frame 47 by cam-actuated sliding-bolts, is provided with grooved cleats 51 to receive a screen 52, and has an opening 53, through which the buttermilk may be withdrawn after turning the pivoted plate 54. Fig. 7 shows a thermometer 44 supported in a sleeve 45 in a tubular casing 43 of the drum 4; the counterweight 46 maintains the end of the thermometer in a vertical position. Fig. 8 shows a rotatable pipe 40 with a vent hole 43 which

communicates with the hole 39 in the casing 36 when it is brought to its highest position during the rotation of the drum 4. The weight 42 maintains the pipe 40, in the position shown, with the opening 43 at the top.

6386. Czaplowski, J. March 19.



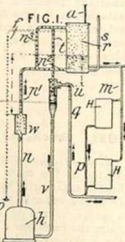
*Heating liquids.*—In the mixing machine shown in the Figure, the substance being mixed may at the same time be heated by passing steam or hot water or other liquid through the hollow shaft 7 into the arm 6, thence through the horizontal tubes in the directions indicated by the arrows back through a separate passage in the arm 6 and out through the end of the hollow shaft.

6541. **Bowing, J.** March 20.

*Heating by steam circulation.*—Relates to a method of superheating and utilizing steam in industrial operations. The method, shown as applied to a retort in which coking is performed, consists in passing steam through a superheater, constructed so as to increase the heat without increasing the pressure, and delivering it as a blast where it is conveyed to a retort in which a charge to be heated is contained, and finally exhausting the steam while it is still dry. The chambers *d*, *d'* in the example given are heated alternately by the combustion of gas within them or by the passage of furnace gases. The chambers are filled with honeycomb or other bricks. By the manipulation of suitable valves, the steam is turned into the chamber which has been heated to the required temperature and passed to the coking-chamber *a* through the perforated pipe *p*. The flues are shown at *g*, *h*, *h'*, the gas inlet pipes at *e*, *f*, *f'*, and the steam-supply pipe at *l*. The gaseous products are allowed to escape from the coking-chambers by the outlet *g*, while the removable bottom *b* permits of the discharge of the carbonaceous material.

6852. **Brueckner, W.** March 24.

*Heating water; heating buildings &c.*—Relates to hot-water heating-apparatus, in which the water is heated above 100° C. so as to accelerate the circulation in the system of pipes and allow tubing of smaller diameter than usual to be used. The hot water passes from the boiler *h* by a pipe *n* opening into a closed receptacle *w* which regulates the current by causing the liberation of bubbles of steam. This receptacle is connected by a pipe *n'* and branches *n''*, *n'''* to the

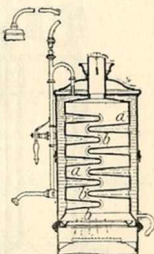
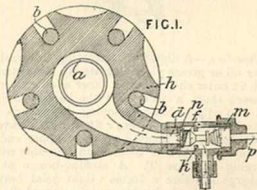


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bottom and top of an expansion cistern *r*, having an expansion pipe *s* and a safety-valve at *a*. Circulation pipes *m* lead to the heating-coils *H* and the return pipes *p* lead to an ascending pipe *q*, which discharges into a head-piece *u* at a fixed distance below the expansion cistern. A dip pipe *t*, connected with the branch pipe *n''* or the top of the cistern *r*, depends into the head-piece *u*, which is connected by a descending pipe *v* with the boiler *h*. A steam pipe *f* is connected with a device *o* for regulating the heat of the furnace. The pipe *n'* may dip into the receptacle *w* so as to prevent hammering. The head *u* may be situated on the ascending pipe *q*.

6895. **Oltzcher, C. F.** March 25.

*Heating water.*—A water heater for baths has a number of tubes *b* projecting into the heating space in the inner jacket *a*. The tubes communicating with the water space between the two jackets and cause the gases from the flame to pursue a zig-zag course.

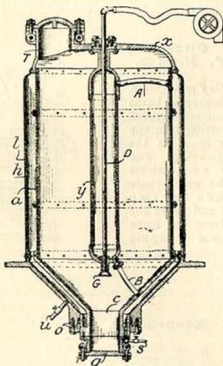
7373. **Kendrick, A.** March 30.

*Steam traps.*—To the inlet *d* of a main pipe is connected a device for draining-off condensation water from horizontal steam pipes. A valve *f* under the pressure in the main closes on the seating *k*; on that pressure sinking to atmospheric pressure, the valve is released by the spring *m*, and any condensed water escapes through the groove *n*. The valve *k* may also be released by applying pressure to the stem *p*.

**7426. Wollaston, T. R.** March 31. *Drawings to Specification.*

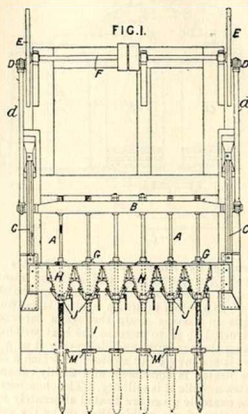
*Heating water.*—Consists in a modification of the decanting vessel used in the apparatus for softening water, described in Specification No. 6129, A.D. 1901, which apparatus comprises also arrangements for heating water by steam in surface apparatus, and mixing it with reagent.

**7519. Haddan, H. J.,** [Edson, E. R.].  
March 31.



*Digesters.*—A digester for treating fish waste, or other oil or grease yielding material, is constructed with an outer shell *l* and an inner shell *a*, forming between them a jacket for the heating-medium, and also with a bottom sloping downwards to a central discharge aperture *c* fitted with a cover *g*. Both shells *a* are secured at their upper ends to the cover *x*, which is formed on one side with a charging-aperture *T*. A stuffing-box *o* at the discharge aperture *c* forms a tight joint between the lower ends of the inner and outer shells, and also allows the inner shell to expand freely with the heat. Pipes *A*, *B* connect the jacket space with a central cylinder *y* removably secured at the upper end to the cover *x*, as shown, and containing an air-conducting pipe *D*, which is connected at the upper end to an air pump and terminates below in a perforated nozzle *G*. A supply pipe *u* and a drain pipe *s* are fitted to the lower end of the jacket.

**7582. Herdman, G. A.** April 1.

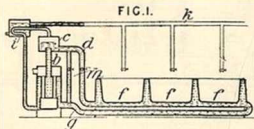


*Non-conducting coverings.*—Steam and other pipes and surfaces are covered with slagwool applied in a loose and flocculent condition. The wool is granulated by rubbing it through a riddle and rammed into tubular casings of cotton serim which may be wound round a pipe. This coating may be covered by a plaited or braided covering of jute or asbestos yarn. An outer protective casing, composed of slagwool, clay, and sodium silicate, may be applied in a plastic form. The wool is rammed into the tubular casings by a gang of vertical rams *A* on a crosshead *B* coupled by rods *d* to crank-pins *D* on discs carried by a shaft *F*. Each plunger works through a guide *G* and a charging funnel *A* having a tubular extension *I* attached to it by a dovetailed head-piece *J* and a set-screw. The unfilled tube is stored on the extension *I*, and, as it is filled, it passes between this extension and a rubber ring held in a clamp *M*.

**7681. Reck, A. B.** April 2.

*Heating by water circulation; boiling-pans.*—Water in the main rising pipe *b* of a boiler is heated sufficiently to produce steam. This separates from the water in the receiver *c*, and condensing in a tank *i* returns to the boiler. The heated water from the reservoir *c* is led by means of a pipe *d* to the cooking-vessels *f* and back again to the boiler

by a return pipe *g*. By closing a valve in the pipe *d* and opening a bye-pass *m*, the cooking-vessels are disconnected from the boiler. The water heated



in the tank *i* is utilized to supply the service pipes *k*. Should the cooking-vessels be some distance from the boiler, the tube *d* is continued inside the jacket of the vessels and terminates in a row of perforations on one side.

7805. **Leatham, A. E.** April 4.

*Natural heat, utilizing.*

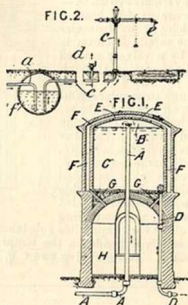
—Relates to means for utilizing the breath for heating the body. A tube, shaped like a horn or otherwise, is formed with a wide opening above, which is placed over the mouth and beneath the chin of the wearer. The other end is inserted beneath the coat, cloak, or other garment, to which it is secured by a safety-pin *G* passed through a strap *D*. The wearer takes in breath through the nostrils and breathes out down the tube. The tube may be made of aluminium or other metal, or of composition.



7869. **Coda, C.** April 6.

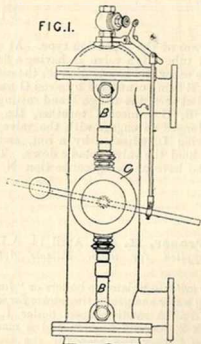
*Heating water.*—Relates to warming naturally or artificially the water in reservoirs to prevent the water from freezing. Fig. 1 shows a cross-section of a hydraulic plant, with reservoir above. Air is drawn from the heated chamber *H* and communicates with the surface of the water in the reservoir *C* by means of the pipe *A*. The holes *E*, *G* place the space *F* in communication with the space *B* and the chamber *H*, so that the space *F* becomes an air-jacket to the reservoir. The water is conveyed from the main, and to the places desired, by the pipe *D*. Fig. 2 shows a view of the reservoir *f* below the ground. Here the pipe *a* supplies the water from the main, and air is

compressed in the space above. The pipe *c* distributes the water to required points *d*, *e*.



8125. **Cormack, W., and Cormack, J.** April 8.

FIG. 1.

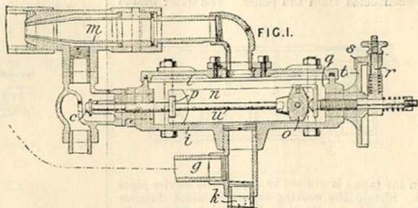


*Thermostats.*—In a water-heating system, in which the water is heated by steam coils or by a fire, the temperature of the water is regulated by a Heintz regulator, Bourdon gauge, or similar tube arranged in a chamber *C* in the water-circulating pipe *B*. The tube operates a spindle, connected through levers and rods or chains, with an equilibrium or other steam valve or an ashpit door for regulating the draught.

8314. Heintz, A. April 9.

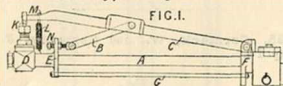
*Heating by steam circulation.*—

In an apparatus for heating railway vehicles &c. by steam circulation, the supply of steam is controlled by a valve *c* carried by a spindle *u* passing through a chamber *i*. The live steam passes through an annular chamber outside an injector tube *m*, through which air and steam are induced from the chamber *i*, which communicates, as shown, with the discharge passages *g*, *k*. The valve *c* is operated thermostatically by a flexible steel tube *n*, hermetically sealed at the ends *o*, *p*, and containing napha or other very expansible substance, so that the steam supply depends on the temperature in the chamber *i*. A regulating-screw *q*, attached



to the terminal *o*, is adjusted by a carrier *r* having an index *s* moving over a disc *t*. The condensations from the return steam pipe *g* pass into the pipe *k*.

8432. Buckley, P. April 14.



*Steam traps of the expansion type.* At one end of a metal tube *A* is a valve *D* having a flange *E*, and at the other end is a casting *F*, the casting *F* and flange *E* being connected by a rod *G* under the tube *A*. Between the flange *E* and casting *F* are two arms *B*, *C* connected together, the arm *C* being prolonged to engage with the valve spindle *K*. A spring *L*, adjusted by a nut, assists the arm *C* to hold the valve spindle down. The arm *B* may also have a spring connection *N* to the flange *E*.

8476.

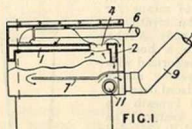
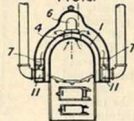


FIG. 1

FIG. 3.

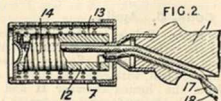


8476. Fraser, H. A. April 14, A.D. 1902,  
[date applied for under Patents Act, A.D. 1901].

*Heating water.*—Relates to boilers or "furnaces" for heating water and generating steam for warming buildings &c. A saddle-shaped boiler *1*, with a water back *2*, forms a firebox, and is made with an opening *4*, near the rear, for the escape of the furnace gases into the space enclosed by the outer casing. The gases pass forwards around the water-outflow or steam-education pipe *6*, and descending at the front, they return beneath side baffle-plates *7* to the chimney flue *9*. Openings are made through the baffle-plates *7* at the rear for the passage of some of the gases behind the water back *2* to the chimney direct. The return pipes of the heating system are connected at *11*.

(For Figures see next column.)

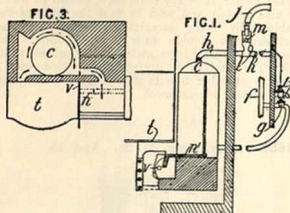
8480. Dubé, J. E. April 14.



*Heating by electricity; heating water and other liquids.*—A thin wire *14*, preferably of silver, is heated by the passage of a current furnished by means of leads *17*, *18*, passing through the handle *1*. The wire is wound in a spiral groove *13* on a hollow cylinder *12* of insulating material, preferably porous earthenware. This cylinder

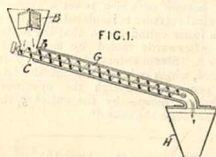
rests within a perforated metallic cylinder 7, crimped at the base, which allows free access of fluids, such as air, water, or other liquids to be heated.

8532. Brookes, T. April 15.



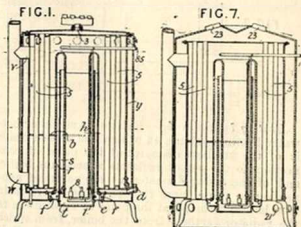
*Heating water.*—Relates particularly to improvements upon the apparatus described in Specification No. 20,179, A.D. 1897, [Abridgment Class Stoves &c.]. Where the pressure is sufficient, water is supplied to a boiler without the use of a head-cistern, means being provided for preventing siphoning. Fig. 1 shows a side view, partly in section, of the stove, the boiler, and the feeding and draw-off pipes. In order to draw off water at the aperture or "dummy" cock *i*, water is admitted to the boiler *c* from the main *f* by opening the cock *g*. The hot water passes out through the top of the boiler by the pipe *h* and raises the ball *m* against the end of the open jug *j*, whereby the inlet of air is prevented. On closing the cock *g*, the ball falling upon the grid or perforated seat *l*, permits the entry of air and breaks the siphon column in the pipe *h*, so that the continued flow of water is prevented. The boiler is heated by opening the sliding damper *v* which permits the gases to pass around the boiler.

8586. Westcott, M. K. April 15.



*Heating by steam circulation.*—In an apparatus for heating and mixing fodder, the shoot *G* and the hopper *H* are steam-jacketed and provided with valves for the regulation of the steam.

8590. Shaw, T. P., and Paddon, J. E. April 15.

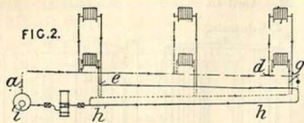


*Heating water; heating air.*—Relates to heaters for hot-water and hot-air heating systems.

Fig. 1 shows one form of water-heater. An elongated vertical combustion chamber *h* open at the top end but closed at the bottom end *i*, contains a gas vapour, or oil burner 8, or a coal fire. The walls of this chamber are so arranged that air for combustion from the annular chamber *e*, after passing up the space *r* and down the space *s* enters the chamber at *t*, and is heated. The gas also, when gas is used in the burner, is heated before combustion by leading the gas-pipe round the top of the combustion chamber, and down the space *s*, to the burner. A series of vertical water-tubes 5 are connected at their lower ends to the "distributing member," to which the return pipe of the heating system is connected at *d*, and at their upper ends to the "concentrating member," to which also the heating system is connected at 3. The products of combustion after circulating through the vertical tubes, being deflected in their passage by the baffle-plate *b*, escape to the chimney through damper-controlled branches *w*, *v* in an internal casing *y*. The air for combustion enters the outer casing at 85 and passes down to the chamber *e*, which is provided with regulable openings *f*. In a modification, Fig. 4, the water tubes 5 are bent outwardly at their lower ends and connected to an annular chamber 19, to which the return pipe is connected. The baffle-plate *b* is located in the "draught chamber" 20. Fig. 7, shows an arrangement for heating air, in which tubes 5 are carried through the top and bottom of the apparatus. Cold air is admitted at 21 and pipes 23 conduct the heated air away.

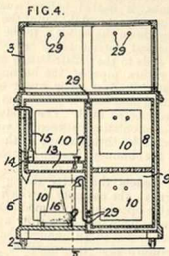


## 8592. Atkinson, R. E. April 15.



*Heating buildings &c.*—Relates to steam or hot-water heating-systems, in which the return main is of the smallest diameter at the point of connection to the set of radiators nearest the boiler, and of increasing diameter at the points of connection to those more remote. The return main is of largest diameter at the point of connection to the radiator farthest from the boiler, from which point it remains of the same diameter until it reaches the boiler. It also slopes downwards from the radiator near the boiler towards that farther away. The improvements may be applied to systems in which steam is employed under or above atmospheric pressure, to vacuum-pump systems, or in connection with steam traps. A vacuum heating-system, in which steam under pressure is used, is represented diagrammatically in Fig. 2. The dot-and-dash lines represent the steam-supply main, which is of greatest diameter at *a* near the boiler *i*, and least at *d*. The full lines represent the return mains, which are of smallest diameter at *e*, increasing in size to the point *g*, whence the return pipe *h* is of uniform diameter. The dotted lines show the return mains as hitherto used.

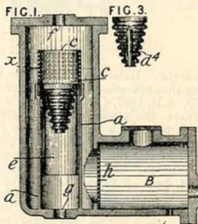
## 8644. Yates, O. April 24, A.D. 1902. [date applied for under Patents Act, A.D. 1901].



*Heating by air circulation.*—Relates to a show case with arrangements for heating peanuts, and for keeping confectionery warm and dry. The body is double-walled and provides a heating-chamber 6, a peanut compartment 7, and compartments 8 and 9 for storing confectionery, with circulating passages for the heating medium. Each

compartment has a door 10 at the back, and chamber 7 has at the front and at one end glass panels through which the contents may be view; chambers 8 and 9 may also be similarly fitted. The bottom of the chamber 7 forms a hot-water tank 13, communicating with a steam dome 14, from which the generated steam is discharged through vent tubes 15. The water is heated by a lamp or other heater 16 in the chamber 6, the air in which is also heated and used to heat the body of the cabinet by being circulated through passages between the double walls of the cabinet. The escape of hot air is regulated by adjustable vents 29. The cabinet is preferably provided with a display chamber 3 with glass front and sides, and is mounted on castors 2.

## 8656. Cumming, D. B. April 16.

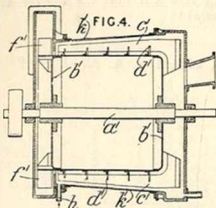


*Heating liquids.*—Apparatus for heating feed-water by steam, applicable also to heating other liquids, consists of an outer vertical cylinder with an upper, central steam inlet *f* and a lower, central water-outlet *g*. An inner concentric cylinder *a*, extends part of the way up the outer cylinder and forms with this outer cylinder an annular chamber, into which the feedwater is introduced from the filtering chamber *B* or otherwise, through the perforated plate *h*. The cylinder *a* carries, at its upper part, a short perforated cylinder *c*, and, immediately below this, a perforated and corrugated "water retarder," Fig. 3, in the bottom of which is set a steam tube *d*. The conical retarder is insulated from the cylinder *a* by an inner cylinder *e* so that the heated liquid is not afterwards cooled by contact with the cylinder *a*. Steam enters by the inlet *f* and heats the water, which is kept at about the level *z* and which percolates through the openings in the retarder and escapes by the outlet *g*, the steam passing through the tube *d*.

## 8671. Theisen, E. April 16.

*Heating liquids.*—Relates to improvements in the centrifugal apparatus described in Specification No. 12,693, A.D. 1901, and consists of devices for preventing the formation of gas currents behind the

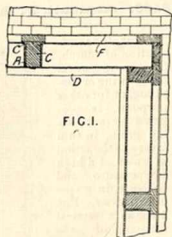
centrifugal blades, the gas in these currents not being brought into sufficiently good contact with the liquid. Several devices may be adopted. (1) Obstacles to such currents are provided on the



rear of the centrifugal blades, either plates or vanes being fixed on the blades themselves, or vanes or ribs, which may be perforated, fixed on the cylinder or the shaft carrying the blades. (2) Openings may be formed in the centrifugal blades, or the blades may be arranged as a series of perforated plates in close proximity behind one another. (3) Perforated plates or ribs may be fixed to the casing, and project into slots in the centrifugal blades. (4) The outer casing is formed slightly conical, as shown in Fig. 4, in which the shaft  $a^1$  carries the cylindrical drum  $b^1$ , having blades  $c^1$  which are preferably arranged in oblique positions and taper to correspond with the conical casing  $k^1$ . They also have ribs  $d^1$  on their rear sides.

**8682. MacAlister, A. P., and Gibbs, R. R.** April 16.

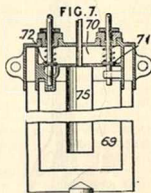
*Heat-retaining chambers and the like; non-conducting coverings and compositions.*—The linings, walls, floors, and ceilings of refrigerating chambers, heating chambers, safes, string-rooms, receptacles for keeping food hot, and other structures, are insulated and rendered fire-proof by soot, vegetable black, or other carbon deposit or residue, which may be treated with sodium silicate, china clay, alum, or powdered asbestos. The material is, preferably, placed in sealed boxes A placed one above the other between vertical stanchions C, having shoulders  $c$ , and layers F of Willesden



paper, the whole being covered by match boarding D. Cardboard boxes with adhesive lids, or flexible cotton or like boxes with lids which can be pasted down, may be used.

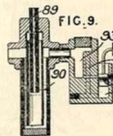
**8792. Harris, A. C.** April 18.

*Heating water in coin-free sale apparatus for hot drinks such as coffee, tea, or beef preparations, and for cups made of paper or papier mâché, sometimes with a straw or a biscuit.* Hot water is obtained from a boiler 69, Fig. 7, which is kept full by a feed-pipe leading to the bottom and has at the top a measuring-chamber 70. The inlet and outlet lift-valves 71, 72 hang from a rocker which is operated by a finger swinging first to the inlet side and then to the outlet side.



Vent-pipes rise from the boiler and measuring chamber.

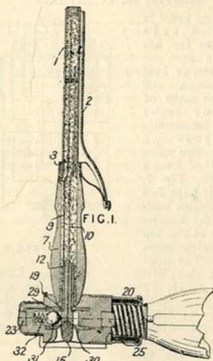
*Thermostats.*—The boiler having an internal air-chamber 75, the gas supply to a burner for heating it is regulated by the effect of the pressure on a mercury seal 90, Fig. 9, from the gas pipe 89. The outer tube of the mercury seal with the air-chamber is connected to a small chamber 93, which, normally, is cut off from the atmosphere by mercury in a passage 94 and a well 95, but, if the pilot burner goes out, the mercury is driven up into the small chamber 93 and air following the mercury seal cuts off the gas. A notice 96 that the gas is cut off is carried by a float 97 on the mercury of the cut-off device.



**8971. Shepherd, M.** April 21.

*Heating by electricity.*—Electrically heated curling-tongs comprise a hollow member 1 containing a resisting material, which consists of a mixture of iron borings, graphite, and native manganese oxide. The other member 2 is a metal strip joined to the member 1 by a pivot 3. Current is conveyed through the resistance material by the bare ends of the insulated wires 9, 10 carried in the handle 7, the contacts for supplying the current being the portion 19 at the end of the metal sleeve 12 and the metal piece 15. The ordinary lighting-circuit is utilised by means of a device 20, having one end adapted to be inserted into a lamp socket and the

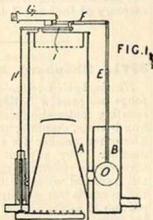
other end adapted to receive a lamp bulb. The central contacts 23 and 25 are connected to contact-plates 29 and 30 respectively. These contact-plates have openings to receive the contacts of the curling-tongs and are normally connected by a metal ball 31 pressed into contact by a spring 32, so that the



lamp circuit is completed. When the contact 15 of the curling-tongs is first inserted into the opening of the contact-plate 29, the ball 31 is pushed aside and the circuit broken; the further insertion of the holder 7 brings the contact 15 against the plate 30 and the contact 19 against the plate 29, so that the circuit is completed through the curling-tongs heater and lamp in series.

**8977. Barralet, T. E.** April 21.

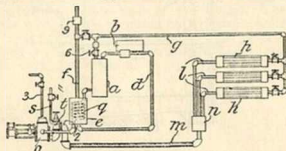
*Heating water.*—Fig. 1 shows a section of a geyser in which the water reservoir A is fitted with an auxiliary chamber B, in which a float works to regulate, automatically, through rods E, F, the supply cock G. The gas cock may be simultaneously operated by the lever F, which rests upon the end of a pivoted lever I to the outer end of which the valve-rod I' is attached. The lever I, on its pivot, may be made of a fusible alloy.



In a modification, the gas

valve is kept raised, so long as water enters the apparatus by a pivoted cup with a hole in the bottom, through which the water passes. The float O may be placed in the reservoir A. Specifications No. 5336, A. D. 1898, and No. 5767, A. D. 1901, are referred to.

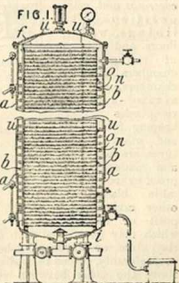
**8987. Huntlag, A. A.** April 21.



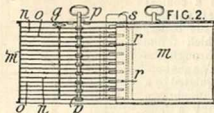
*Heating buildings &c.; heating water.*—Factories, mills, rooms, and other structures, glue-pots, driers, and other apparatus used in shoe factories, and water are heated by steam from a boiler a or exhaust steam from an engine b. The engine exhaust pipe d is connected to the casing e of the feedwater heater which has a steam outlet pipe f leading to an exhaust pipe h, having a back-pressure valve i, and a heating-pipe g connected with the radiators k. Outlet pipes l are connected through a coupling n with a return pipe m leading to an enlarged bend 2. Cold water is supplied by a pipe s to a spraying-device t to condense the steam, or the steam is condensed by the water which it is used to heat. A pump o, having a vent pipe 3 for the escape of air, drives water through the heating-coil g to the boiler. A reducing-valve 6 and ordinary valves are provided as shown.

**9106. Aspinall, F. B.** April 22.

*Digesters.*—A solution of starch, for use in worts for brewing or distilling, or for other purposes, is prepared by subjecting grain, in thin layers, to the action of water at a high temperature and pressure, in a special digester. Fig. 1 shows a vertical section of the digester, and Fig. 2 one of the containing drums. The digester a is provided with a removable cover f, heating coil b, and



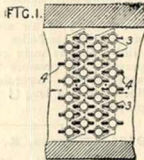
water inlet or outlet *i*, and is charged with a series of perforated drums *m* provided with recesses to engage the guide rods *u*. Each drum *m* contains a number of fixed perforated plates *n* and movable



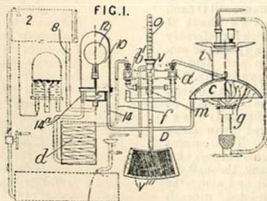
intermediate plates *o* connected to a rod *p* and attached to the plates *n* immediately above, by lazy-tongs connections *q*. The grain is charged through the openings *r* upon the plates *o*, these are then lowered to rest on the plates *n*, and the openings *r* are closed by a slide *s*. When desirable, flavouring, colouring or other substances may be placed in the digester. The Provisional Specification states that the grain is placed in a structure consisting of a set of perforated pipes or chambers forming a kind of nest, supported in the digester.

**9107. Wadham, R.** April 22.

*Heating air and other gases.*—The tubes 3 of an economiser are made with one or two longitudinal external webs 4 adjusted in the direction of the flow of the gases, to prevent eddies &c.



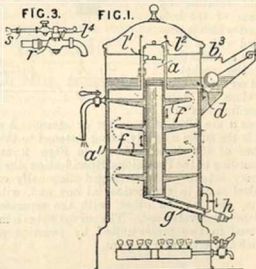
**9144. Treves, M., and Raffegaun, D. V. M.** April 22.



*Heating liquids.*—Relates to apparatus for heating water, or any other liquid, and delivering it at

any temperature desired between that of the atmosphere, or a cold supply, and that of the boiling point of the liquid. The liquid is stored in a tank 2 and passes by an outlet 8 to a vessel 10, in which a given level is maintained by a float and valve 12. From this vessel, the water passes by an outlet 14 to the heating-apparatus C, or by an outlet 14<sup>a</sup> to a refrigerating-coil *d*. The boiler, preferably heated by gas, consists of the space between two spherical calottes *g* communicating with a cylindrical chamber *i*, the discharge from which is regulated by a cock *a*<sup>1</sup>. The cold-water passes by a pipe *f* to a cock *b*<sup>1</sup>. The cocks *a*<sup>1</sup>, *b*<sup>1</sup> are each connected to a lever pivoted at *V*, so that as one cock opens, the other closes, and *vice versa*. In the outlet from the mixing-chamber *m*, a thermometer *O* is placed. The two cocks *a*<sup>1</sup>, *b*<sup>1</sup> are insulated from one another. In order that water at any temperature between that of the cold supply and the boiling point of the liquid may be obtained, the operating-lever *V* is fitted with an extensible end *V*<sup>11</sup> adapted to work over a diagram *D*. An arc of a circle, corresponding to the effective range of the lever *V*, is divided, in the case of water, into 100° as shown. Along one radius, a number of divisions are set out equal to the possible range of the temperature of the cold supply, and then corresponding numbers are connected by diagonal lines, the remaining lines being drawn approximately parallel. To adjust for the supply at any given temperature, the lever is first lengthened to the radial graduation indicating the temperature of the cold supply, and it is then moved on to the lines passing through the desired temperature on the bottom line.

**9191. Jackson, H.** April 23.



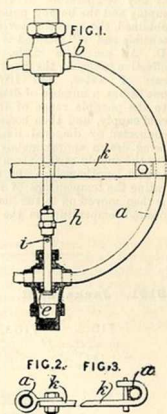
*Heating water, geysers for.* Relates to modifications in the apparatus described in Specification No. 11,927, A.D. 1894. According to the present invention, the water from the outer space *a*<sup>1</sup> is

led through the connection *g* into a series of hollow discs *f*. These communicate with a central annular column *a*, open at the top and provided with two caps *l*, *l'* for preventing boiling over and excluding dust. A trap *d* prevents the hot water from passing into the ball cistern *b*<sup>1</sup>. By removing the plug *h* at the outer end of the connection *g*, sediment can be blown out. Fig. 3 shows a device for locking the gas cock. The handle is provided with a drop lever *l*, which engages with teeth *r* on the shell. The arm *s* of the pilot moves with the lever.

**9237. Nesbit, D. M., and Clowes, W.**  
April 23.

*Steam traps.*—

Two curved tubes *a*, entering a socket *b* on the end of the steam-inlet pipe, actuate a valve which allows the accumulated water to escape. In the form shown, the other ends of the tubes *a* open into the valve casing to which the outlet pipe is attached. A valve-stem, whose length can be altered by turning the nut *h* over the right and left handed screws on the ends of its two parts, one of which may be prevented from rotating by means of the hole *i*, and which is provided with a loose valve *e*, and is fixed on the socket *b*, and serves to open or close the valve according as the

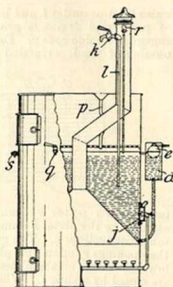


tubes *a* are filled with water or steam. A stay *k* holds the tubes rigidly, being fastened to them by either of the devices shown in Figs. 2 and 3. According to the Provisional Specification, the tubes *a* may actuate links, arranged diagonally on the central stay, in connection, at one end, with the stem, and, at the other, with the separate and independent valve-rod. The curved tubes *a* may be formed in two pieces united by junction pieces, which the cross stay *k* grips.

**9248. Ewart, J. W., and Ewart, G. H.**  
April 24.

*Heating water.*—Boilers for supplying boiling water

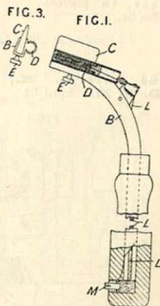
for making tea &c., intended especially for use in refreshment houses, are heated by gas burners in a conical chamber in the bottom of the boiler, from which a flue passes through the water. The gas supply is regulated by a rubber diaphragm *j*, covering a hole made in the boiler and forming one side of a chamber into which the gas-supply pipe leads. When the pressure in the boiler reaches a certain



valve, at which the water just boils, the diaphragm pushes a cone on it into the gas pipe. A safety-valve *r* is provided, set in the top of the flue. A warming-chamber is formed in the top of the boiler, and is provided with a grating, on which plates may rest. On opening the cock *k*, water is forced up the pipe *l* and drawn off. The funnel *p* catches any drippings and the water is removed from the warming-chamber by the drain cock *q*. The expansion valve *s* allows free passage of air and closes when steam is generated in the boiler. The feedwater vessel *d* is filled from the main supply, and the ball cock *e* prevents the pressure in the boiler forcing the water back; according to the Provisional Specification, a long U tube may be used for the purpose.

**9264. Haynes, R.** April 24.

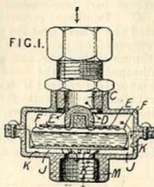
*Heating by electricity.*—A hand tool such as a bookbinder's or a leather worker's creasing tool is heated electrically by means of a resistance coil *D* fixed to the shank *B* which is preferably of a U-shaped section and bent as shown in Fig. 3 to hold the bit *C*. The bit may be additionally secured by a screw *E*. The current passes along the shank, through the coil, and along the insulated wire *L* to the switch or plug connection *M*. The coil is protected by a shield.



The coil is protected by a shield.

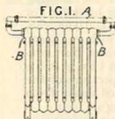
**9632. Cleland, J., and Stewart, J. C.**  
April 29.

*Steam traps.*—The entry of steam and water to the casing K is controlled by a valve D with a flange E resting on a corrugated vessel F containing a substance which expands and contracts as the temperature varies. This vessel rests on ribs J surrounding the water outlet M. The valve seat C is adjustably screwed to the valve casing.



**9742. Fisher, R. P.** April 30.

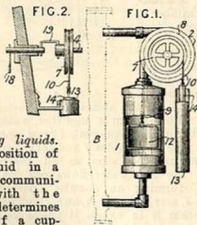
*Heating buildings.*—Tubular towel rails A are fitted to an ordinary radiator B, so that the water or steam circulates through the whole apparatus, and the towels are dried.



**9899. Stanley, F. E.** May 1.

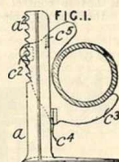
*Heating liquids.*

—The position of the liquid in a chamber communicating with the boiler determines that of a cup-shaped weight therein, suspended from a pulley on an axle carrying an indicating arm, and counterbalanced. The casings 1, 2, Fig. 1, communicate with the boiler or like vessel B above and below the normal water line. The casing 2 contains a pulley 8, keyed to the axle of which is the pulley 7 outside the casing. Hanging from these by ropes 9, 10 are the weight 12 in casing 1 and the weight 14, guided by the tube 13. Where the axle passes through the side of the casing a shoulder upon it is kept against the side by means either of a spring, or the fluid pressure within the casing in order to prevent leakage. Fig. 2 shows the connection between the axle 4 and indicating arm 18 by means of the link 19 which is adopted for motor road vehicles.



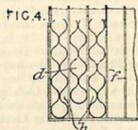
**9903. Wallas, I. C., and Ward, J.**  
May 1.

*Heating buildings and structures.*—Relates to means for adjustably supporting the pipes of steam, hot-air, hot-water, or other heating-systems, to facilitate setting-up and to provide for expansion and contraction of the pipes. The standard *a* is formed with teeth *a'* on each side of its central slot in such a way that the hand *c'* can be supported by the pin *c''* in the teeth in conjunction with the stop *c'*. The hand may be provided with one immediately above for carrying another pipe. A projecting lug *c''* for ensuring a central position on the standard may be provided. The standard is supplied with a foot, but the method of supporting the pipes is applicable where the standard is carried on brackets. Rollers may be fitted to the supports to assist free expansion.



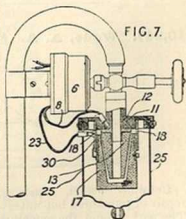
**9927. Haller, E. Gremli.** May 1.

*Heating air, water, &c.*—Series of tubular channels *d* for the fluid to be heated are formed by bending sheets of corrugated metal back upon themselves or by placing separate sheets in contact. They are secured between inlet and outlet chambers, and are separated by bars *f* leaving spaces *h*, through which the cooling or heating medium circulates. Clamping-bars may be employed to keep the corrugations in close contact. If desired, the channels may be of spiral shape.

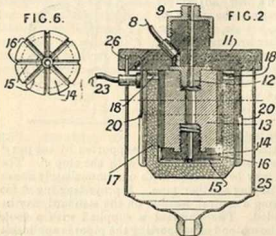


**10,180. Hill, H. D.** May 5.

*Heating water.*—An electric heating-apparatus is attached to a water-supply tap, so as to furnish a stream of hot water. In Fig. 2, an insulating-block 11 is screwed to the water tap by means of a cap 9, and has a flanged part 12 connecting to a terminal 8, and to an inner cylindrical metal electrode 13, at the base of which is fixed a distributing-block 14 of

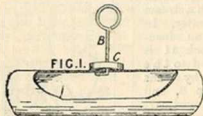


insulating-material. An outer cylindrical metal electrode 17, surrounds the inner electrode 13, but is not in contact with it. Water descends from the supply pipe through openings in



the parts 9, 11, 12, and down the centre of the inner electrode to the distributing-channels 15, in the block 14 shown in Fig. 6. Thence it passes up channels 16, and between the inner and outer electrodes, to be discharged through passages 18 into an outer chamber 25, which discharges it finally at the base. The outer electrode 17 forms the bottom and side walls of the passages 15, 16 in the distributing-block, and it is fluted on its outer surface. An upper ring 20 attaches the outer electrode to the block 11. An opening 26 in the outer casing 25 prevents any possible back pressure on condensation of steam. Fig. 7 shows terminals 23, 8 connected to outer and inner electrodes, and passing to a switch 6, automatically operated when the water supply is turned on. A modification in the shape of the electrodes is also shown in Fig. 7, the inner electrode 13 being conical in shape and the outer electrode 17 fitting with it. Thus the size of the water passage between is adjustable, by screwing the outer electrode in or out of the ring 20, and so the rate of discharge of water, and consequently its temperature, may be varied.

10,247. Wade, A. A. May 6.

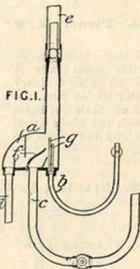


Hot-water bottles, repairing. Relates to the repair of punctured hot-water bottles, and the like. The part around the puncture is cleaned on the outside by means of naphtha and sandpaper and

on the inside by means of a wire B which is rotated with the bent, roughened end pressing the punctured part into contact with a leather support C. Puncture repairing solution is then injected and is held near the puncture by doubling the surrounding part either between the finger and thumb or in a clip, and after the solution has been heaped round the outside of the puncture, the evaporating solvent is ignited and blown out several times to vulcanize the india-rubber in the solution around the puncture. The patch is finally pressed and slightly dusted. In modifications, the patch may be placed either entirely on the outside or entirely on the inside of the puncture.

10,397. Steinmetz, W. G. F. May 7.

Heating water.—Relates to apparatus for heating water by steam for baths and laundries, in which means are provided for preventing the temperature of the heated water from rising above a certain maximum, independently of the supply of water or steam. A water-heating chamber a, in which are fitted a steam pipe b, a cold water supply pipe c, and a hot water discharge pipe d, extends in the direction of the steam jets g, acting as an injector. When steam is admitted, water rises in the chamber a, being prevented from entering the discharge pipe d by baffles f and the suction action of the steam. As soon as all the steam is absorbed, the hot water flows out. A tubular insertion, forming an annular space with the extension e, serves to catch any condensed steam. If the steam is in excess, it passes out by the extension e and does not escape by the discharge pipe d.

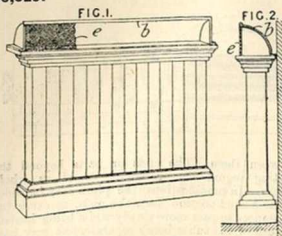


10,529. Cooksey, A. W. May 8.

Heating buildings.—A radiator, more particularly of the kind in which heated air is delivered through more or less vertical pipes, has a deflector b, the mouth of which is protected by a grating e. Asbestos or other non-conducting packing may be placed between the deflector and the radiator and on the outer surface of the deflector. A back and sides may be provided to form a water container to keep the air of the room moist.

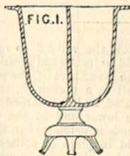
(For Figures see next page.)

10,529.

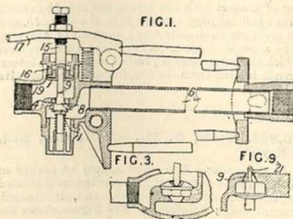


10,640. Newton, H. May 11.

*Boiling-pans.*—Wash boilers, coppers, boiling-pans, and similar vessels are divided by partitions so as to enable different materials to be boiled in the separate compartments. The partitions, which may be provided in the lid also, may be cast with the pan, or secured by soldering, or other means. These partitions may be applied to boilers used in the washing of clothes, as in laundries, or to boiling-pans used in the boiling of vegetables and in the preparation of cattle food.



10,724. Brooke, R. G. May 11.

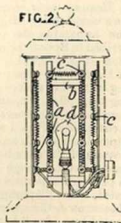


*Steam traps.*—In steam traps worked by expansion, by floats, or otherwise, and especially in traps of the kind described in Specification No. 6148, A.D. 1900, the water-discharge valve is provided with a supplementary valve or plug, in order to

check the discharge when the main valve is slightly open, and to reduce vibration. A compound valve, consisting of a main water-discharge valve and the supplementary water-discharge valve, is so arranged that the main valve will be moved away from its seat to some extent before the supplementary valve has moved from its seat sufficiently to allow water to rush past it. When the main valve moves to close the discharge opening, the supplementary valve moves to a position in which it checks the rush of water or steam while the main valve is still some distance from its seat. Fig. 1 shows a steam trap of the kind described in the Specification referred to above, in which a conical supplementary valve 8 is formed on an outwardly-projecting extension 9 of the main conical valve 1, both valves having their seats in a bush screwed through the division wall 4. The face of the supplementary valve and its seat are so inclined to the axis of the valve that the valve 8 opens to a less extent than the valve 1 when the compound valve moves longitudinally. The valve extension 9 passes into a hollow spindle 15, which is provided with an annular shield 19 to prevent issuing fluid from entering the stuffing-box 16. The contraction of the expansion tube 6 actuates a lever 17, which acts on the spindle 15 and pushes the compound valve off its seat. Fig. 3 shows another arrangement for use in steam traps in which the fluid pressure acts to force the discharge valve off its seat. The supplementary valve may have its face inclined or parallel to the axis of the compound valve. The supplementary valve face and its seat may be inclined to each other, or its seat may be doubly-coned, so as to be partly parallel and partly inclined to the valve face. Fig. 9 shows a modification in which the supplementary valve is made separate, and mounted on the stem 9 of the main valve, so that the main valve may open slightly before a collar 21 on the stem 9 bears upon the supplementary valve and causes it to open.

10,772. Binko, H. May 12.

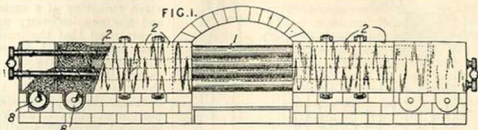
*Heating by electricity.*—In the heater or stoves shown in Fig. 2, the resistance *a* is in sections mounted on the insulating-supports or studs *c* at their ends, and its base. The sections are held in position by the frame *b* and are easily removed or renewed. An incandescent lamp *d* adds to the appearance of the heater. The ends of the wires *a* are wound round the insulating studs *c*, or the studs may be in two parts between which the ends of the wires *a* are clamp'd. Reference is made in the Provisional Specification No. 15,130, A.D. 1901.





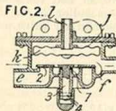
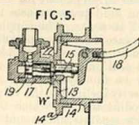
10,834. Ekenberg, M. May 12.

*Heating apparatus.*—Relates to apparatus for heating in open-ended tubes or passages, substances containing liquid or moisture, such as peat, bone, wood chips, coal, chemicals, &c., for the purposes of charring, coking, producing chemical reactions or decompositions, and for other purposes. It is particularly applicable for destroying the shiny matter in turf which prevents it from consolidating when being made into block fuel. The materials are introduced by conveyers 8 and fed forward by other conveyers to the heated portion of the tubes 1. The substances in adjacent tubes move in opposite directions. The tubes may be arranged close together or with heat-conducting material

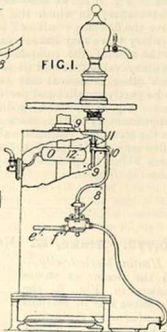


between them. The ends or parts beyond the heating region are preferably found as whole blocks. In modifications, the pipes may be wider at the heated portion than the ends, to cause the substances to pass more slowly while being heated. Instead of the tubes being separate, one may pass inside the other. The conveyers may be in the form of a chain, helix, screw, or pump, or a combination of a pump with one of the other forms may be used.

10,848. Jones, C. J., and Still, W. M. May 12.



*Heating water.*—In a modification of the apparatus described in Specification No. 26,171, A.D. 1902, for heating water for making tea, coffee, &c., and for other purposes, the gas supply to the burners is regulated by a flat valve in a chamber *f*, Figs. 1 and 2, supplied with gas by a pipe *e* leading into an internal annular recess in the bottom of the chamber. The stem 3 of the valve 2 passes down through the wall of the chamber, and is provided with nuts 4 for adjusting the lift of the valve. The diaphragms *j* are carried by an adjustable screw *l*, the space *k* between them being connected by a pipe 8 to the pipe 9, through which the water is forced out of the boiler. When water is withdrawn from the boiler, the reduced pressure in the pipes 8, 9 causes the diaphragms to contract and

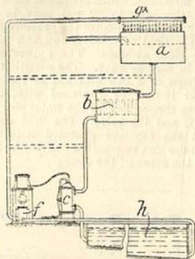


allow the valve 2 to open fully, the valve being held in its normal position by a weight or spring 7. The lower part of the pipe 9 is fixed to the boiler shell by a branch 10, to which the pipe 8 is connected, and is enlarged at its upper part to receive the lower end of the upper part of the pipe 9, which is connected to the infusers &c., packing 11 held in place by collars 12 ensuring a water-tight joint. The water supply to the boiler is regulated by a float *o*, which can be withdrawn through an opening into which a tubular boss 14, Fig. 5, is screwed, a plate 15 closing the outer end of the boss carrying a valve *w*. The stem of the valve is formed with guide ribs or wings, which fit the valve chamber 17, and is held against the float lever 18 by a spring 19. A flanged ring 14<sup>a</sup> holds the plate 13 in position, and a screw is provided for regulating the area of the water inlet 22. In another arrangement, in which the valve *w* is out of contact with the steam, the arm 18 extends into a tubular plug screwed into the plate 13, and its pivot pin extends through the wall of the plug into a coupling-piece, and carries an arm, against which the valve stem is pressed, as before, a lateral branch leading from the coupling-piece to the valve chamber 17.

10,865. Row, O. M., and Royles, Ltd. May 13.

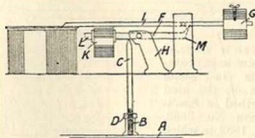
*Heating water.*—The water supply of plunge or wash baths is periodically or continuously aerated or revived, filtered, heated, and, if desired, charged with a disinfectant. The Figure shows the arrangement employed. From the bath *h*, a pump *f* withdraws the water and conveys it to an overhead tank *a* through the perforated pipe *g* from which it falls in the form of spray. Thence it passes to a filter *b* and heater *c* and again to the bath. The course of the water may be varied by the provision

of branch pipes, such as shown in dotted lines, and controlling valves. The heater *c* is preferably of the type described in Specification No. 15,192, A.D. 1891, in which exhaust steam is employed, or in



Specification No. 19,416, A.D. 1893, to which heater a supplementary supply of live steam is added. The filtering and softening apparatus is preferably of the kind described in Specifications No. 24,526, A.D. 1893, No. 27,447, A.D. 1897, and No. 10,586, A.D. 1899, [*Abridgment Class Filtering &c.*].

10,885. Whitehouse, W. H. May 13.

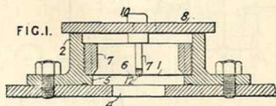


*Thermostats.*—An extra lever is employed in the heat-regulating apparatus of an incubator so as to increase its sensitiveness. This lever *F* is pivoted in a bracket *H* on the top of the incubator, one end *L* being provided with an adjustable weight *K* and the other *M* being bent upwards to engage with the damper-lever *I* at a point just beyond its pivot. Near its point of support the lever *F* rests on a screwed rod *C* which is adjustable in an internally-screwed tube *B* attached to the capsule *A*. A nut *D* locks the pointer *C* in its adjusted position. When the weights *K*, *G* and the pointer *C* are properly adjusted, an expansion of the capsule *A* raises the weighted end of the lever *F*, and thus releases the weighted end of the lever *I*, which falls and opens the damper.

11,031. Biggin, F. May 14.

*Heating water.*—A safety device for boilers, heating-apparatus, and the like, consists of a disc 1

adapted to resist the normal working pressure in the boiler, but to be ruptured by excessive pressure, and formed partly of material adapted to be fused under excessive temperature. The disc is

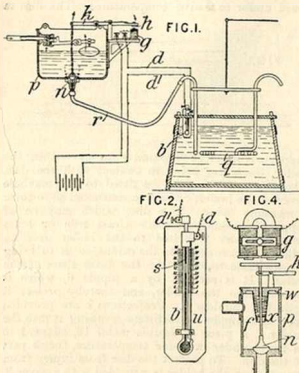


supported in close proximity to or within the boiler, the water being in contact with the disc. The safety device may be fitted to the manhole cover of the boiler, or be so constructed as to form a manhole cover. The disc, which may be of copper, is mounted within a cast iron or brass tubular holder *2*, bolted to the boiler over an orifice *4*, or screwed into the orifice, so as to bring the disc close to, or within, the water space of the boiler. It is secured by a nipple *6*, which is screwed into the holder, and thereby presses it against a shoulder *5*. Projections *7* are provided upon the nipple to facilitate screwing it into the holder. A piece of fusible metal *12*, adapted to be fused under excessive temperature, forms part of the disc. To protect the disc from injury from the exterior, the holder is provided with a cover *8*, having slots which engage with lugs *10* upon the holder. The lugs are arranged so that the cover is held a short distance above the holder, to allow for the escape of steam or water after the rupture of the disc.

11,038. Rougement, W. von. May 14.

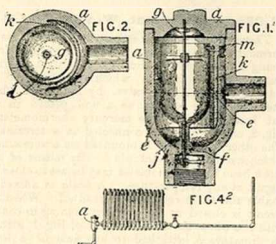
*Thermostats.*—The temperature of liquids in fermentation vats is automatically prevented from rising above a certain limit by a contact thermometer, placed therein, which is arranged to actuate electrically a valve, by means of which the cold water supply to a coil placed in the vat is regulated. The mercury thermometer *b*, Fig. 2, carries a wire *n* connected to a terminal *d*. The other terminal *d'* is mounted on a screw head which carries a contact pin *s*. By means of this screw head the thermometer may be set to close the circuit at any temperature. A scale is affixed to enable the temperature to be read off. When the circuit is closed by the mercury coming in contact with the pin *s*, the electromagnet *g*, Fig. 1, attracts an armature *h*, attached to one arm of a lever. The other arm *k* is thus raised and lifts the valve *n*, allowing water to flow from the cistern *p*, through the flexible tubing *r*, to the coil *q*. When the temperature has sufficiently fallen, the circuit is opened by the thermometer and the valve closes. If considerable cooling is to be effected, a valve shown in Fig. 4 is employed. In this the water supply pipe enters the casing *p* directly. On the circuit being closed, the valve *n* is raised by the electromagnet *g* and lever armature *h*<sup>1</sup>. In order that a weak current may be sufficient, the weight of the

valve and its spindle is balanced by the lever  $k^1$ . To pack the spindle, a flexible casing  $x$ , extended



by a spring  $f$ , has one end fastened to the spindle and the other to the cover  $w$ .

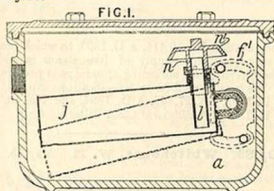
**11,141. Harrison, A.** May 15.



*Heating by steam circulation; steam traps.*—The invention relates to means for discharging air and condensed water from radiators for heating by steam. Fig. 4<sup>2</sup> shows the position, with respect to a radiator, of the apparatus, which comprises a casing  $a$  closed by a cover  $d$ , Fig. 1. Inside the casing is a partition  $k$ , shown in section in Fig. 2, forming a chamber for a bell-shaped float  $e$ , which has a valve  $f$  attached to it. The valve and float are guided by a rod  $g$ , which fits them loosely so as

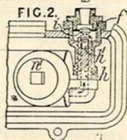
to leave an air passage at  $j$ . When enough water of condensation accumulates in the chamber  $a$  to seal the lower edge of the partition  $k$ , the float rises and the water is discharged. A screw plug  $m$ , having a hole in it, which is opened more or less by screwing the plug in or out, may be provided. This plug tends to equalize the pressure on the two sides of the float after actuation and enables the valve to close at once. The apparatus may be modified in various ways. The partition  $k$  may be in the shape of a bell attached at the top to the casing; or it may be dispensed with, the casing itself being shaped so that the water seal is formed between it and the valve. The float may also be closed at the top and provided with a pad to prevent noise due to possible contact between the float and the cover of the casing.

**11,234. Tonge, R., and Butterworth, J.** May 18.



*Steam traps.*—Relates to improvements in steam traps of the kind described in Specification No. 3663, A.D. 1882, in which a float and valve control the discharge of condensed water into a cistern

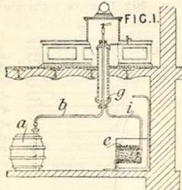
having a suitable exit. The object of the present invention is to give greater power in opening and shutting the valve, by the use of a large cylindrical float. The water of condensation passes through the adjustable hollow boss  $f^1$ , the passage way  $h^1$ , and the spindle  $h$ , into the float  $j$ , which is thereby rendered waterlogged. While sunk in the cistern  $a$ , this float keeps open the valve  $i$  by the quick thread on the spindle  $h$ . When steam enters the float, it forces the water through the pipe  $l$  into the cistern, and the float  $j$  rises and closes the valve  $i$ , thus stopping a further access of steam. The upper end of the pipe  $l$  is provided with an adjustable air valve  $n$ , through which air or steam may pass out from the float. The amount of opening in this air valve is controlled by the conical deflector  $n^1$ .



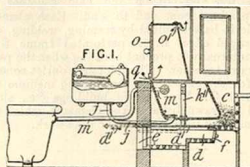
11,361. **Elsenbach, C.** May 19.

*Heating liquids.*

—Relates to apparatus for regulating the temperature of wine, beer, &c. The pipe *b*, leading from the cask *a*, passes through a cylinder *g*, which is supplied with hot or cold water by the pipe *i*. The coil *c* is heated or packed with ice according to requirements.

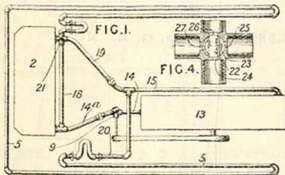


11,460. **Dean, F.** May 20.



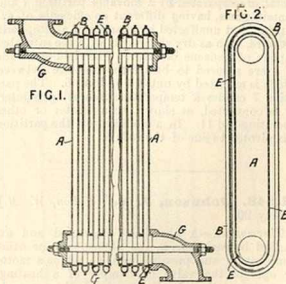
*Heating water; boiling-pans.*—Relates to water-heating or washing boilers for domestic purposes, which may be fitted in an ordinary fireplace, or in a partition between two rooms, and which are provided with means for preventing the escape of vapour into the room. In addition to the ordinary fireplace *c*, two other fireplaces *d*, *e* may be employed, a door *f* enabling these fireplaces to be stoked from either room, and a damper *d'* cutting them off from the boiler flues. Flues lead from the fireplace *c* round and beneath the boiler. The water-supply pipe *j* has, at its outlet, perforations and a distributing-cap for discharging the water along the floor of the boiler. The inlet end of the pipe *m* which leads to a bath is closed by a perforated plate. A vertical stand pipe *k*<sup>11</sup> perforated at its upper end, is detachably mounted in a discharge pipe *m* leading from the bottom of the boiler to the outside of the fireplace. Above the open top of the boiler in one room is arranged a chamber, provided with doors *a*, air-inlet holes *g*, and an outlet *o'* discharging into the flue.

11,411. **Worth, W. O., and Donaldson, W. R.** May 19.



*Heating buildings &c.; heating water.*—Relates to means for utilizing the waste heat of internal-combustion engines for heating purposes in rooms of houses and other enclosures. When a valve 21 is in the position shown in Fig. 1, that is, at right-angles to that shown in Fig. 4, the circulating medium, starting at a pump 9 passes through a pipe 14<sup>a</sup>, a bye-pass pipe 18, ports 22, 27, 25 of the valve 21, the pipes 5, comprising the heat-radiating system within the area to be heated, the pipes 20, 15, through the water spaces of the engine 13, then back to the pump 9 through a pipe 14. On turning the valve 21 through 90°, the circulation will be from the pump 9 through the pipe 14<sup>a</sup> into a tank 2, comprising part of an outside cooling system, through the ports 26, 22, 24 of the valve, into the pipes 19, 15, and thence back to the pump through the engine and pipe 14. The heat-radiating system is thus entirely cut off. If the valve be turned to occupy a position intermediate between the two preceding positions, the port 22 may open partly into the ports 25, 27, and port 23 into the ports 26, 25, and the water will circulate both through the cooling tank 2 and the bye-pass pipe 18, and the temperature of the area may thus be regulated. The valve may be operated by any convenient mechanism or any thermo-kinetic device.

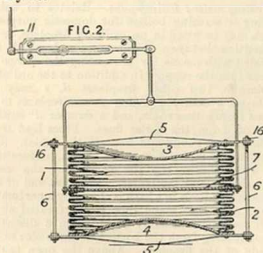
11,534. **Watel, H. G., Seagrave, G., and Bevington, S. E.** May 20.



*Heating buildings &c.; heating air.*—Apparatus for heating generally comprises a number of

sheet-metal elements A with interfitting sockets at the top and bottom and held together by bolts passing from end to end. Each element is made in halves united by seaming, welding, &c. the flanged edges B. A perforated frame E is fitted internally to prevent buckling when the parts are drawn together. The inlet and outlet connections for the steam or other heating medium are shown at G. For heating buildings &c., air is forced or drawn between the elements, which are then enclosed in sheet metal or brickwork.

11,547. Johnson, J. Y., [Fulton, W. M.].  
May 20.

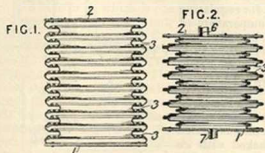


*Thermostats.*—Relates to an apparatus, operated by changes of temperature, for indicating such changes, for regulating the temperatures of buildings &c. by operating steam or other valves, or for operating an automatic fire alarm, fire extinguisher, or other mechanism. Two closed collapsible chambers 1, 2, preferably of corrugated sheet metal, are separated by a movable partition 7 and contain gases, having different co-efficients of expansion, but unaffected by changes of atmospheric pressure, such as dry air and air with the saturated vapour of benzene or ether. The rigid end walls 3, 4 are secured to bars 5 the distance between which is adjusted by nuts 16 on links 6. The partition 7 carries a temperature-indicating pointer, or is connected, as shown, to a pointer or other operating-rod 11. In a modification, the partition 7 is pivoted to one of the rods 6.

11,548. Johnson, J. Y., [Fulton, W. M.].  
May 20.

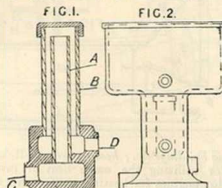
*Thermostats.*—A chamber, contracted and expanded by variations in the atmospheric or other temperature and pressure so as to act as a motor or operate the valve or damper of a heating-apparatus or the recording-arm of a thermograph, has rigid end walls 1, 2 connected by longitudinally-flexible walls 3. These walls are, preferably, made of tin, brass, iron, or other sheet metal and are

corrugated in such a way that there are no angular bends and expansion can take place longitudinally only. Fig. 1 shows a chamber with closed ends



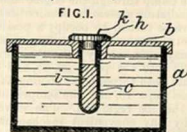
adapted to operate a thermostatic device or a thermograph. The chamber may be substantially cylindrical or conical, and the horizontal and vertical parts of the main corrugations may have subsidiary corrugations.

11,588. Sherwin, G. E. May 21.



*Heating liquids.*—A steam-heated apparatus for heating water and other liquids, which may be fitted in cisterns and the like, consists of an outer closed tube B within which is mounted an inner smaller tube A open at both ends. The steam, which enters by the inlet C, Fig. 1, is condensed on coming in contact with the outer tube, which is surrounded by the liquid to be heated, and escapes by the outlet D. Fig. 2 shows the apparatus fitted in a cistern.

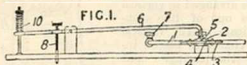
11,632. Lang, A. May 21.



*Heating liquids.*—A vessel c, containing chemically-reacting material i, is closed by a lid h and immersed in the fluid to be heated. The vessel,

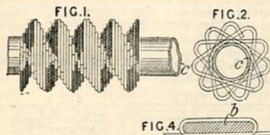
the walls of which are made of thin well-conducting material such as aluminium, copper and the like, may be supported in the cover *b* of an outer vessel *a*, or be suspended by a hook from the cover or side thereof. In other arrangements, the vessel *c* is provided with supporting-legs, which rest on the bottom of the vessel *a*. A slow ignition fuze *k* may be employed to ignite the reacting material.

**11,677. Draper, J. E.** May 22.



*Thermostats for regulating the temperature of an incubator by controlling the supply of gas, oil, air, water, or other fuel or heating or cooling agent.* The supply pipe 1 is furnished with two cocks 7, 2 and with a by-pass 3 fitted with a rubber or other pliable tube 4 the supply through which is regulated by the pressure upon it of a finger 5 on a lever 6. The thermostatic capsule is connected with the adjustable screwed rod 8, the movement of the lever 6 being controlled by the adjustable spring 10.

**11,678. Kitchen, J. G. A., and Perkins, L. P.** May 22.



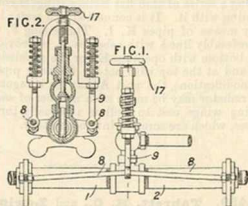
*Heating buildings &c.; heating air, water, &c.*—Helices of polygonal form are applied externally to the tubes of heating, cooling, and condensing apparatus in general and of condensers and coolers for motor cars in particular. Figs. 1 and 2 show the application of helices of triangular section to a tube *c*. They are formed by winding wire, ribbon, or the like on a flat mandrel *b*, Fig. 4, having rounded edges. When taken off the mandrel, the helices assume the form shown in Fig. 2 with the corners in advance of each other. The ends are secured by bending them round the tube and hooking them over one of the next coils. By varying the size and shape of the mandrel, helices of different forms can be obtained.

**11,740. Stetson, J. A., Koehler, F. D., and Monahan, T. W.** May 22.

*Steam traps.*—As water collects in the pipe

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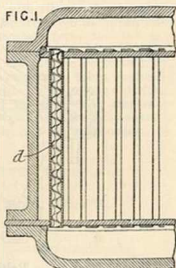
sections 1, 2, the sections contract owing to cooling, thus buckling the rods 8 and raising the vertical rods 9, which, in turn, raise the yoke and



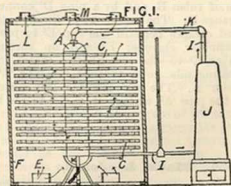
the valve-stem shown, lifting the valve from its seat. When all the water has escaped, the pipe sections again expand and close the valve. By means of the handle 17, the valve may be adjusted or opened.

**11,968. Shore, W.** May 26.

*Heating-apparatus.*—Spiral metallic strips *d*, which serve as baffles, are secured in the centre of the tubes of feedwater-heaters, condensers, and similar heaters and coolers. The Figure shows the apparatus of the kind described in Specification No. 3343, A. D. 1893, [Abridgment Class Steam generators].



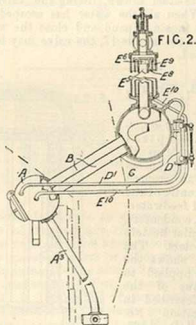
**12,220. Archer, D. J.** May 28.



*Heating air.*—In apparatus for heating air by hot water, for warming buildings, a radiator is

enclosed in a casing, having air inlets and delivery pipes, and connected to an external water heater. The radiator consists of a circular hollow post A, having a series of thin flat hollow wings C communicating with it. It is connected to a water heater J by means of pipes K, I. The casing F, which is preferably lined with asbestos L, is provided at the bottom with openings E for the admission of air, and at the top with hot-air delivery pipes M. In modifications, the post A may be octagonal, or the radiator may be made of a number of sections having wings cast to hollow internally-threaded bosses, which are screwed into each other.

**12,459. Tabrett, H. C., and Lewin, W.**  
June 2.



*Heating liquids.* — Relates to apparatus for utilizing the waste heat in smoke stacks &c. for the distillation of salt water or foul water, or for heating or superheating water or other liquids. The cylinders A, C communicate by means of a series of tubes B, and by a pipe D<sup>1</sup> connected to the gauge D. The vapour rises through the pipe E<sup>1</sup> and escapes beneath the cap E<sup>2</sup> to pass down the annular chamber E<sup>3</sup> and up through the chamber E<sup>4</sup> to the condenser. Water from the separating pile flows through the pipe E<sup>5</sup> to the cylinder A. The concentrated salt water sinks into the pipe A<sup>3</sup> whence it is led to the bilge or sea.

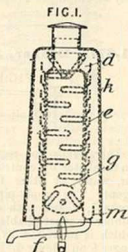
**12,584. Mack, L.** June 3.

*Non-conducting compositions.* — Consists in a composition for use as an insulator against heat or cold, obtained by calcining powdered gypsum with 2 per cent. of colophony, the temperature not

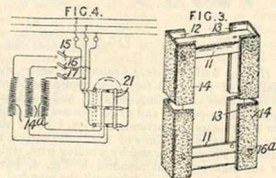
being allowed to exceed 150° C., to prevent the decomposition of too much colophony.

**12,796. Mancke, R.** June 6.

*Heating water.* — Relates to a water heater for baths &c. which does not require permanent fixture. A number of flat tubes arranged in vertical series out of line communicate with vertical end chambers placed inside the casing. The uppermost flat tubes discharge into two pipes through which the water passes into deep channels d, upon opposite sides of the casing. Below these a number of channels e convey the water by a zig-zag path to two collecting-tubes m which are connected to the out-flow f. A deflecting-plate g is provided below the flat tubes, to receive the flame of a gas, oil, or spirit burner. Two other tubes, oppositely inclined, may be also affixed at the bottom of the heater. A cover k provided with a chimney encloses the whole apparatus.



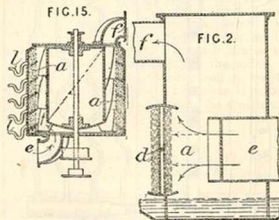
**12,838. Carolan, E. A., [General Electric Co.]** June 8.



*Heating by electricity.* — A set of conductors are wound in helix form round supporting frameworks covered with asbestos and these are suitably attached to an open metal casing. The conductors 14<sup>a</sup> in Fig. 4 are arranged for use with a three-phase alternating system and can be combined in a variety of ways by means of the switches 15, 16, 17 and the three-blade switch 21. Fig. 3 shows one framework composed of trough-like supports 11, with end strips of sheet brass 12, 13 covered with insulating material 14. Supports of insulating material are fixed to the strips and

help to retain the resistance coils in position. The ends of the coils are connected through insulated terminals 16 to the switches in Fig. 4, which may be placed in any suitable position outside the casing. The framework of Fig. 3 is fixed to a perforated metal casing by stove bolts fastened to the opposite ends of the supports 11. The casing may be complete in itself or may be shaped so that it can be fixed to a wall or in any other convenient manner.

13,034. Theisen, E. June 10.

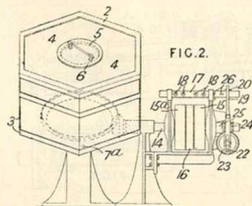


*Steam traps.*—Relates to a method of, and apparatus for, separating solid or liquid particles from gases and vapours, which can be applied to increase the efficiency of steam traps. The gas or vapour issuing from a pipe *e* is caused to impinge against one or more stationary cushions *a* of gas produced by the gas pressure itself, the liquid particles being retained by the cushion and the vapour or gas rebounding therefrom and passing out through a pipe *f*. The vessel within which the cushion is formed is filled with metal shavings, strips or the like, and a perforated or wire-gauze partition may be arranged between the filling and the vessel to facilitate the passage of the liquid, which falls into a pan underneath containing water. In Fig. 2, two vessels are shown which can be rotated on a spindle *d* so that one may be cleaned while the other is in action. The supply pipe may be arranged vertically over a cushion constructed with smooth or corrugated surfaces or circular bodies, through which the dust and liquid fall, or the gas may be led round a spiral chamber having a series of cushions formed on its walls. The pressure may be produced, and the gas driven against cushions formed on the inner surface of a drum, by revolving vanes; in Fig. 15 each annular compartment containing a cushion is shown provided with a separate discharge pipe *l* for the liquid, and the vanes are formed obliquely on the revolving drum.

13,134. Bennett, W. June 11.

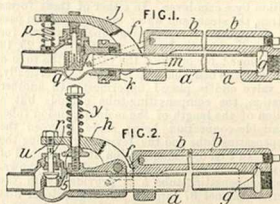
*Heating water; boiling-pans.*—Fig. 2 shows a front view of a laundry machine in which the

clothes are boiled, washed, or starched in a hexagonal prism-shaped rotating tub 2, made either of metal, such as copper or aluminium plates, riveted together and closed at each end by a flanged plate,



or of wooden boards bound together by metal hoops 3. The clothes and liquid are introduced into the tub, through a hole 5 in a cover 4, which hole is then closed by a water-tight lid 6. The tub is provided with a draw-off plug 7, and may or may not be provided with ribs, feather boards, or beaters, projecting interiorly from the junctions of the boards. In another form the tub is enclosed within a fixed casing, preferably of sheet metal, and the walls of the tub are perforated, a thorough circulation of the liquid being ensured by inclined webs or the like bolted to the exterior junctions of the sides of the tub. The temperature of the liquid, which is maintained by steam admitted by a pipe leading into the outer casing.

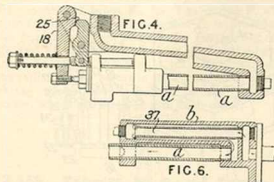
13,431. Ogden, J. E. L. June 16.



*Steam traps.*—Relates to steam traps of the expansion-tube type. The object is to arrange the ports in such a way that they may adjust themselves automatically as the pressure of steam varies. Several examples are described and illustrated in the Specification. In each of these, two expanding passages are provided, one of which is capable of movement upon the other. This relative movement is employed to open the outlet-valve of the



trap. Further, the compensating-tube in the combination is, in general, filled with steam which is free from the condensed water. As regards Fig. 1, the main expansion tube *a* carries the valve *g*,

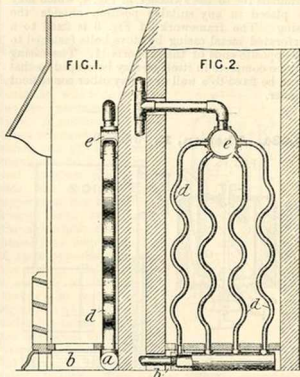


which is made to open against the pressure of steam and is connected to the compensating-tube *b* by the small aperture *g* and by the flexible tube *f*. The steam and water enter the tube *a* while, when the trap is placed horizontally, steam only enters the tube *b*. When the tube *a* contracts, owing to the presence of water within it, the nut *k* actuates the lever *j*, the fulcrum *m* of which abuts upon the pressure of the spring *p* and releases the water. Fig. 2 shows a variation in which the valve is raised to allow the water to escape. The adjustable bolt *u* presses upon the end of the valve-spindle *r*. To blow through, the nut *5* is provided to lift the lever *h* against the spring *y*. In another variation, a ring-shaped lever is placed between the compensating-tube and the lever, which is raised to permit the valve to open, and instead of the communication *g* between the two tubes the tube *b* is opened at this end to the chamber to be drained. The valve may be retained in its raised position by a cam-lever. In either of these forms of trap, the steam and water may be made to pass first through the compensating-tube, as shown, for instance, in Fig. 4. In this case, the levers 25, 18 are employed for opening the valve as the tube *a* contracts. When the trap is arranged vertically, the valve end is placed uppermost. In another variation, the compensating-tube extends but a portion of the length of the main expansion tube, a suitable connection being made between the compensating-tube and the leverage governing the valve. In Fig. 6, a modification in the method of allowing the steam to enter the tube *a* is shown. The compensating-tube *b* is provided with the internal channel 37 through which the steam first passes. In each case, the valve is formed preferably with an overhanging lip in order to deflect the outflowing water.

**13,664. Prior, J. D. June 18.**

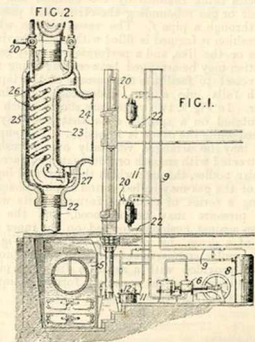
*Heating water.*—To the back of a stove is fitted the water-heater *d*, of which side and front views are shown. The water enters the horizontal chamber *a* in the ashpit *b*, and ascends four waved

tubes *d*, which are of flattened section, to the hollow boss *e*, from which it circulates to the



building or apartment to be heated. In the case of gas stoves, the water-heater is embedded in the incandescent asbestos.

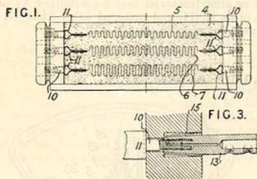
**14,061. Kehm, A. June 24.**



*Heating air; heating buildings &c.*—Relates to means for heating air for warming cars, rooms,

and buildings. The invention is described as applied to the building shown in Fig. 1. Compressed air from a reservoir 8 in the basement is led through a main 9 to each apartment, and there heated by passing it through a coil 26, Fig. 2, contained in a chamber 25 filled with steam, after which it passes through a nozzle 27 into a chamber 23 and thence into the apartment through an opening 24. The current of air issuing from the nozzle 27 induces a flow of air from the apartment or from outside the building, according to the position of the three-way valve 20, into a second coil in the chamber 25 and thence into the chamber 23 and through the opening 24. Steam is supplied to the several chambers 25 by a boiler 5, which also supplies the air-compressor 6. A pipe 22 from each chamber 25 leads the condensed steam into a main pipe 11, which drains it into a steam trap 12 or directly into the boiler. In a modification, only one heating coil is employed, the compressed air being supplied to it through a nozzle so as to draw in air from the apartment.

14,176. Newell, F. C. June 27, A. D. 1902.  
[date applied for under Patents Act, A. D. 1901].

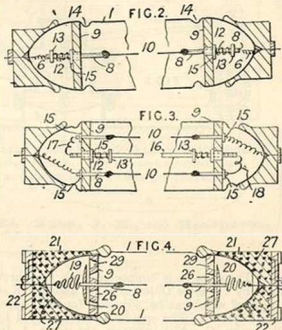


*Heating by electricity.*—Electric heaters or rheostats have crimped metal-ribbon resistances 5, 6, 7, embedded in a filling 4 of insulating material composed of sand, silicate of magnesium, and solution of silicate of soda, and the terminal connections for the resistances avoid the use of soldered joints. The resistances are preferably made of an alloy composed of about 78 parts of copper, 18 parts of nickel, 3 parts of zinc, and 1 part of ferro-manganese, while the filling material is made by mixing 80 parts of sand, 20 parts of silicate of magnesium, and a suitable quantity of silicate of soda solution. The copper plugs 10 have wings 11 which are bent and riveted to the resistance ribbons. The screw-threaded ends of the plugs 10 are engaged by the binding posts 11, Fig. 3, the tapered ends of which fit within the tapered brass ferrules 15.

14,309. Dutertre, G. E., and Nodet, M. F. A. June 27.

*Heating by electricity.*—Relates to electric lamps or radiants specially adapted for use in radiators

and apparatus for roasting, cooking, and heating. In one form, the filament within a glass or crystal tube or bulb is soldered at the ends to metal wires coiled in the form of springs. Fig. 2 shows the

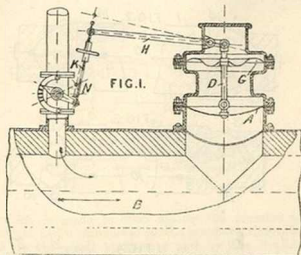


carbon filament 10 soldered to the inner ends of screwed spindles 8 passing through openings in insulating and incombustible discs 9. Metal conductors 6 are soldered to the ends of the tube 1, and to the outer ends of the spindles 8, each of which is surrounded by a spring 12 bearing at one end against a washer 15 and, at the other end, against an adjustable nut 13. Grooves 14 in the tube prevent the discs 9 from approaching each other. Fig. 3 shows two filaments 10 arranged in series and fixed at the ends to metal spindles 8, passing through discs 9 and provided with nuts 15. A spindle 16 connects the discs, and is provided with nuts serving as stops for springs 12 bearing against the discs, the ends of the spindle being connected by wires 17, 18 to the filaments. When long filaments are used, the ends are connected to metal spindles 8, Fig. 4, passing through discs 9 provided with conical openings 26, 29. The outer ends of the spindles are fixed to nickel springs 19, and carry ferro-nickel or steel discs 20. The ends of the tube or bulb 1 fit in ferro-nickel or steel caps 21 provided at the outer ends with insulating-discs 22. The discs 20 and caps 21 are magnetized before or during the working of the apparatus, either by a permanent magnet or by passing the current through solenoids 27. Two or more filaments may be twisted together. In some cases, the exhausted bulbs are charged with carbonic oxide or nitrogen. The Provisional Specification states that fixed or movable reflectors are arranged round the tubes.

14,418. Stevenson, J. L. June 29.

*Thermostats.*—Relates to an apparatus for maintaining an even temperature in the blast of a blast

furnace. The blast pipe B has a lateral chamber containing a dished plate A which alters its shape when the temperature varies and thus moves a throttle valve on a branch pipe for admitting cold



air. The plate A is connected with the throttle valve by a spindle D, levers H, N, and link K, the length of which can be adjusted for the temperature required. The spindle D is supported by a diaphragm G which protects the plate A from cold currents. The temperature is indicated by a dial.

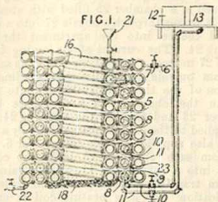
**14,433. Bailey, G.** June 29. *Drawings to Specification.*

*Heating water.*—Relates to a system of hot-water supply for houses in which the heating is effected in an ordinary closed kitchen boiler or in a cistern arranged round the flue leading from the stove. The cold-water supply pipe leads to the bottom of the boiler or cistern, and the hot water is forced out through a pipe at the top as the cold water enters.

**14,529. Smith, L. L.** June 30.

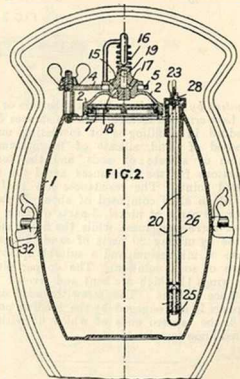
*Heating apparatus; heating water.*—Relates to an apparatus for generating and burning gas and utilizing the heat thereof. Inflammable gas obtained from oil and water is generated and burnt in the apparatus shown in Fig. 1. This consists of a coil of pipes 5, preferably rectangular, connected by a valve 7 with a water main 6. Within this is a second coil 8, through which pass three small pipes, one of which, 9, is connected with the coil 5, and the others 10, 11 with tanks or the like 12, 13. One of these tanks may contain oil and the other a chemical solution or compressed air, or it may be dispensed with. In the three upper coils of the pipe 8, the pipes 9, 10, 11 are perforated, and the coil is connected at the top with a third coil 16, perforated on each side. The coil 5 is filled with water from the main 6. The water is then admitted to the coil 8 by opening a valve 23 and, at the same time, oil is admitted from one of the

pipes 10, 11. A little oil is poured into the coil 16 through a funnel 21 and escapes through the perforations and is caught by an asbestos or like strip 18. This oil, being lighted, heats the coil 8 and



the pipes 9, 10, 11 and vaporizes the oil and water they contain. The vapour escapes through the perforations in the upper parts of the pipes 9, 10, 11 and passes into the coil 16 where it is burnt. Hot water can be drawn from a tap 22, and the heat of the burning gas may be utilized in various ways. Air or other material may be admitted by one of the pipes 10, 11, and material other than oil may be used for making the gas.

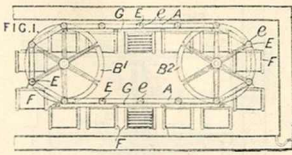
**14,959. Arnold, J. M.** July 6.]



*Heating liquids.*—Relates to apparatus in which water, milk, or other liquid is sterilized, aerated, preserved, and filtered. The liquid is placed in the

tank 1, and the cover 2, containing a detachable filter 7, is clamped down by a ring 5 with arms 4. The tank is then heated, the steam pressure lifting the cone 15 against the action of the spring 16, and, is afterwards suspended in the stand 32, allowed to cool, and aerated. The tank is then reversed in its bearings, and the liquid drawn off through the filter 7, by turning the cone 15 so that the orifices 17 and 18 communicate. Water for drinking purposes is thus obtained, devoid of lime salts or organic substances.

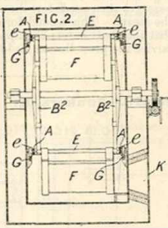
When used for subjecting goods to a special temperature, the walls of the chamber are made hollow or



double and packed with silicate cotton or other non-conductor of heat. One or more access doors K for filling and emptying the cages are provided.

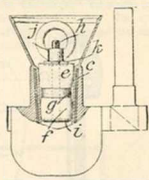
**15,046. Gore, H. R., and Frazer, W. S.** W. July 7.

**Heating-apparatus.**—Relates to apparatus for cooling, refrigerating, heating, drying, baking, cooking, damping, impregnating, or otherwise treating goods in a closed atmosphere, and more especially for cooling goods in chocolate manufacture. The goods are placed in cages or carriers F and conveyed through a closed chamber by a pair of endless chains A. These pass over sprocket-wheels B', B'' and are connected by transverse stretcher bars E, from which the cages F hang freely. To relieve the chains of the weight of the cages, the bars E are provided at their ends with rollers e running on rails G.



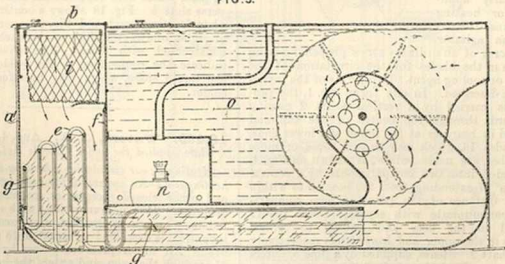
**15,483. Nunn, J. H., and Headworth, G.** July 13.

**Hot-water bottles.**—The neck of an india rubber or other flexible water bottle, suitable for containing hot water, is strengthened by a metal ferrule c or other means to receive an expandible stopper. This stopper is composed of two rubber plugs e, f and a hard washer g mounted on a metal screw h between washers i, k. The stopper is expanded and contracted by turning the nut j.



**15,686. Dubuis, G.** July 15.

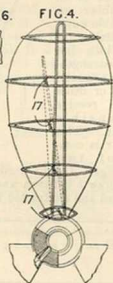
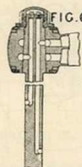
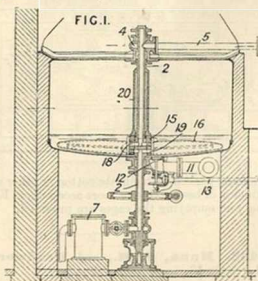
FIG. 3.



**Heating air.**—In special fan apparatus for supplying purified, disinfected, or scented air, the central portion of the casing containing the fan is

elongated to form a chamber o, containing water which is heated by a lamp n, thus serving to heat the air in its passage through the fan.

16,122. **Braselmann, G., and Lünemann, F.** July 21.

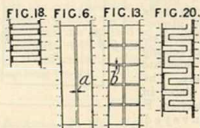


*Heating liquids.*

—Relates to apparatus for heating or cooling liquids generally, and more particularly applicable for heating mash-tuns. It comprises an agitator in the form of an ordinary screw propeller having passages in the blades for the circulation of the heating or cooling agent. Two forms of the invention are described. In one form, Fig. 1, the propeller is carried by a vertical shaft 2 passing downwards through the centre of the tun and mounted in bearings at its upper and lower ends. The blades 16, which may be two, three, or more in number, are made hollow, as shown in Fig. 4, and divided into two compartments by a central partition 17 extending from the boss 15 to within a short distance of the point. These compartments communicate with separate ports 18, 19 provided in the boss and leading to central passages in the upper and lower ends respectively of the shaft 2. Steam, supplied by a pipe 5, enters the upper end of the shaft 2 from an annular passage 4 in the sleeve of the bearing, and passes through the ports 18 into the blades 16, where it circulates outwards on one side of the partition 17

and back on the other side, finally escaping through the ports 19 into the lower end of the shaft 2. An annular passage 4 is also provided in the sleeve of the lower bearing for leading the exhaust steam to the condenser 7. A pipe 11, fitted with a valve 12 operated by a shaft 13, serves for the charging and emptying of the tun. If desired, the blades may be fitted with partitions projecting alternately from the point and the boss 15 or from the sides in order to make the steam take a sinuous course. The upper end of the shaft 2 is fitted with a protective sleeve 20 to prevent burning of the mash. In the second form, the propeller is carried on the end of a shaft projecting upwards through the bottom of the tun. Fig. 6 shows the arrangement of the ports and passages then used for the supply and exhaust of the steam. This second form may be modified so that the shaft enters the upper part of the tun and carries the propeller on its lower end.

16,419. **Junkers, H.** July 25.



*Heating liquids.*—Relates to improvements upon the heating surfaces described in Specification No. 13,113, A.D. 1902. To counteract injurious expansion and contraction of the heating surfaces, the surfaces are slotted transversely and longitudinally, the slots in width being preferably not greater than the distance apart of the surfaces or plates. By way of example, Figs. 6 and 13 show, in plan, plates with longitudinal slots *a* and transverse slots *b*. Fig. 18 shows a continuous zig-zag plate-forming band, and Fig. 20 a series of plates engaging one another like combs, each of which is constructed with slots. The shaded portions indicate the connection to the enclosing wall of the liquid space, which may be effected by soft solder.

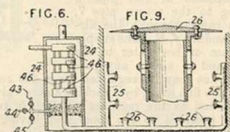
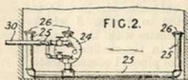
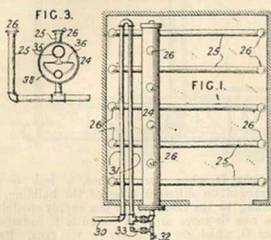
16,489. **Waters, J. A.** Aug. 4, A.D. 1902, [date applied for under Patents Act, A.D. 1901].

*Heating by air circulation; heating buildings &c.; heating air.*—An apparatus for heating ovens, kilns, and other closed receptacles, consists of a heat generator 24 communicating with hot-air distributing pipes 25 within the oven &c. The invention is described as applied to a japanning-oven. Air under pressure passes by the pipe 30, 31 through the oven, and enters the heat generator by a pipe 35 with perforated distributing-branches 36. Here it is further heated by the atmospheric burners 38, which are supplied by the gas pipe 32



and the branch 33 of the pipe 31. The heated air then passes to the pipes 25, the open ends of

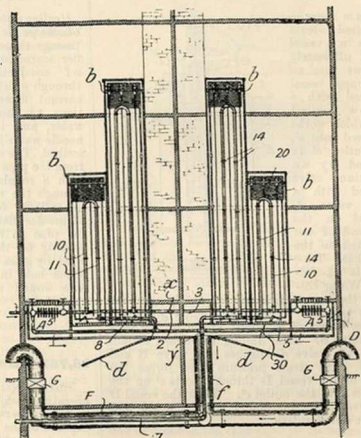
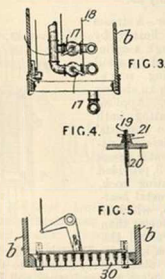
which have adjustable caps 26 to regulate the admission of hot air. In a modification, Fig. 6,



gas, coal, or oil may be employed as fuel, the gas, oil, and air being admitted by pipes 45, 43, 44 respectively. The air passes through chambers or coils 46 to the pipes 25. The heat generator may be

placed inside or outside the oven. In some cases the pipe 31 does not pass through the oven. Several ovens may be arranged in compound series and heated by one generator.

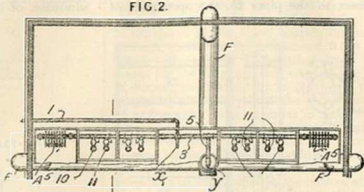
16,585, Marks, G. C., [Knapp, E. R.]. July 28.



*Heating buildings.*—In an indirect hot-air heating system, where radiators need not be employed, fresh outside air has its temperature continually raised during its passage to the rooms without unduly heating the walls. Each room is supplied with hot air by a separate air flue *b*, preferably built in at the chimney sides, containing steam or hot-water heating-pipes, and communicating with

a common air box D in the basement or lower part of the building. The steam or hot-water supply pipe 1, which passes into the air box D, is connected to a pipe 3 which communicates with the uptake pipes 10 in the air flues. The downtake pipes 11 communicate with an L-shaped pipe 8 which is connected to the pipe 5 leading to the return pipe 7, which passes through the air-inlet conduits *f*, F. The supply of steam or hot water to the pipes, and of air to any particular flue may be regulated from the room to which the flue leads, by attaching to the valves 17, Fig. 3, and to the registers 30, Fig. 5, rods 18 passing upwards to the room and having their ends 19, Fig. 4, screw-threaded to receive a nut 21, which bears against a fixed bearing 20. The pipe sections have their ends 14 flanged and bolted together, so as to be easily detached from each other and from the supply and return pipes and withdrawn through a door *d* in the bottom of the

FIG. 2.

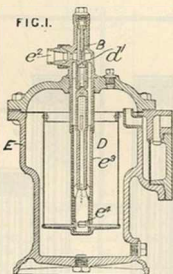


air box D when, for instance, a leak occurs. Arranged on different sides of the building, but leading to the common air box supply conduit *f*, are one or more air-inlet conduits *F*, containing fans *G*, which are preferably electric fans. Radiators *A*, if used at all, are employed on the ground floor only. The air conduits may supply other upwardly-extending flues. The steam and hot-water supply and return pipes may be connected with other air boxes by branches *x*, *y*.

16,605. Dewrance, J., and Wall, G. H. July 28.

*Steam traps.*—Condensed steam collects in a vessel E and ultimately overflows into an open-topped vessel D, fitted with a hollow central stem, which works in a fixed tube *e*<sup>1</sup>. The outlet *e*<sup>2</sup> is regulated by an equilibrium valve B fitted with a pilot valve *d*<sup>1</sup>, mounted on the upper end of the stem fixed to the vessel D. The action is as follows:—Water collects in the receptacle E and eventually overflows into the vessel D, which consequently sinks and opens the valve *d*<sup>1</sup> to admit steam to the back of the valve B. After falling through a certain distance, the valve *d*<sup>1</sup> engages the valve B and opens it. The steam pressure then forces the contents of the vessel D through ports *e*<sup>1</sup> up the fixed pipe *e*<sup>2</sup> to the outlet *e*<sup>2</sup>. When the vessel D has recovered its buoyancy, it rises again and closes the outlet valves.

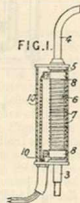
FIG. 1.



16,661. Shoenberg, M. H., and Edwards, J. W. July 29.

*Heating water.*—A stream of water is heated by passage through a cylinder surrounded by a coil of conducting wire, through which an electric current flows. Applications to heating bath water, and to dentists' needle water-jets are described. The water passes from the pipe 3, provided with a regulating cock, through the metal heating-cylinder 5, which is of greater diameter than the pipe to reduce the velocity of the stream. Electric leads 10, insulated by glass tubes, convey current to clamps 8, which hold in place the resistance coil 7 of bare wire wound upon a mica sheath 6 over the cylinder.

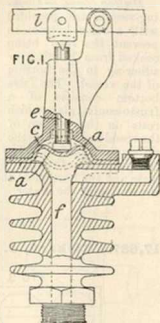
FIG. 1.



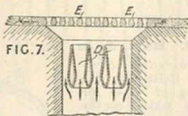
16,787. Wagstaff, J. G. July 31.

*Thermostats; steam traps.*—A thermostat, for operating dampers and the like in connection with heating apparatus, consists of a closed chamber, exposed to the controlling temperature, having an extension *f* which contains a diaphragm *a*, attached to or supporting a lever *l*. A suitable liquid is enclosed in the chamber, which may take the form

of an annular water bottle surrounding a hot-water pipe, and its expansion, due to rise in temperature, lifts the diaphragm *a* and spindle *e* and operates the lever *l*, which is connected to a damper or other regulating device. The cover *c* is made hemispherical or conical, so that, as the temperature rises and the diaphragm is pressed on to the cover, the active area diminishes and the sensitiveness increases. The device may be adapted for pressure regulating. The Provisional Specification states that, by connecting the lever *l* to an equilibrium outlet valve, it can be used as a steam trap, and also that the diaphragm may be replaced by a plunger.



16,823. Grouvelle, J., and Arquembourg, H., [trading as Soc. J. Grouvelle et H. Arquembourg]. July 31.



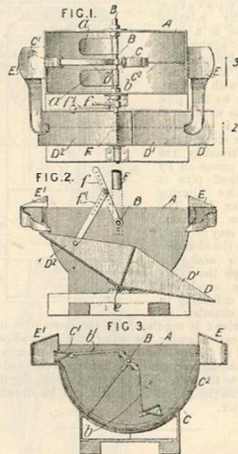
Heating buildings; heating air; heating water.—In apparatus for heating air or water, heating rooms, and similar purposes the pipes, through which one fluid circulates, or the bars of a grating are formed in cross-section in the shape of a lance head, the angles between each pair of inclined faces being so chosen that, when the pipes or bars are placed in position, the faces presented to the arriving current of a fluid are inclined at an angle of about  $30^\circ$ , while the faces presented to the leaving current are at an angle of about  $70^\circ$ . Fig. 7 shows an air passage to a room fitted with such pipes *D* in which hot water or steam circulate. The bars of the grating *E* are similarly constructed in cross-section. Heaters of the kind described in Specification No. 5599, A.D. 1902, may be modified as described above.

17,130. Edwards, J. Aug. 6.

Boiling-pans.—A domestic boiler for cooking purposes is formed with a hemispherical bottom 2, the lower part 4 of the outer wall being concentric with the dome 2, and the upper part 5 cylindrical but of less diameter than the dome 2.



17,251. Kennicott, C. L. March 30, [date applied for under Patents Act, A.D. 1901].



Heating water.—Fig. 1 shows a plan, and Figs. 2 and 3 vertical sections, on the lines 2 and 3 respectively of Fig. 1, of an appliance for adding any suitable chemical solution to water, e.g., such as the feedwater of steam generators, boilers, &c. in order to prevent incrustation &c. The receptacle *A*, containing the solution to be added to the water, is provided with a guide *C*<sup>2</sup> on which slide cups *C*, *C*<sup>1</sup> pivoted to arms *b*, *b*<sup>1</sup> secured to the paddle *a* and rock-shaft *B*. Water is supplied through the pipe *F* and falls into one or other of the compartments *D*<sup>2</sup>, *D*<sup>1</sup>, which as they fill cause the vessel *D* to rock on the shaft *e* discharging the water and actuating the rock-shaft *B* by means of the links *f*, *f*<sup>1</sup>. Each movement of the rock-shaft *B* causes one or other of the cups *C*, *C*<sup>1</sup> to discharge solution into one or other of the channels *E*, *E*<sup>1</sup> whence it flows into the compartment *D*<sup>1</sup> or *D*<sup>2</sup> which is being filled.



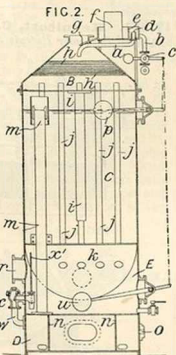
17,269. Sutton, J. W. Aug. 8.

*Non conducting coverings.*—The walls, of refrigerators and the like, have a layer of compressed cork cemented to them, and then a layer of mineralite, i.e., compressed asbestos or uralite.

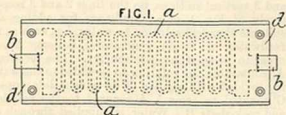
17,456. Simmons, H. Aug. 11.

*Heating water.*—Relates to water-softening, heating, settling and filtering apparatus, specially adapted for use as a feed-water heater for steam boilers. The water, after treatment with reagent, passes by the pipe *i* to the chamber C where it is heated by the steam-tubes *j*. Ultimately the water passes off by the stand-pipe *m* to the filtering chamber D. The steam (exhaust steam may be used) enters the chamber E at *r* and rises through the tubes *j*, the condensed water collecting in the chamber E.

The valve *c* is regulated by the floats *p, w*, in the latter case allowing the water in the stand-pipe *m* to fall to the level of the condensed water, whereupon the valve *x* opens and discharges the condensed water to the filter. The pipe *x'* breaks the siphon *x* before the grease and scum can be drawn into the filter.



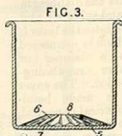
17,568. Huntley, D. Aug. 13.



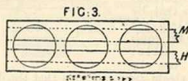
*Heating by electricity.*—Electrical resistance strips of non-oxidizable metal are heated by an electric current, and are mounted between protecting and insulating materials. The zig-zag resistance strips *a* are embedded in a strip of asbestos millboard, and may be covered by a strip of mica *d* leaving only the extension *b* for the electric connections which may be made in any suitable manner.

17,636. Astle, R. T. Aug. 14, A.D. 1902, [date applied for under Patents Act, A.D. 1901].

*Boiling-pans.*—Cooking-vessels are provided with a false bottom to prevent the food being cooked from burning, or adhering to the bottom of the vessel. The false bottom consists of a frusto-conical plate, which rests on the bottom of the vessel and supports the article to be cooked. The sides *6* are corrugated or crimped, thus forming openings *7* between the plate and the bottom of the vessel to allow of the circulation of the water.



17,687. Rickard, J. Aug. 15.



*Heating liquids.*—A milk scalder, applicable also for steaming, boiling, and laundry purposes, consists of a metal water-tank heated by pipes M, H leading from a fireplace arranged at one end of the tank. The tank, which with its fireplace is set in brickwork, is fitted with a cover having apertures into which pans fit.

17,738. Hart, J. A. Aug. 17.

*Non-conducting coverings.*—Relates to the jacketing of pipes or passages which convey cold air, so as to prevent the condensation of moisture upon their surface, and, at the same time, so as to give the pipes or passages a not unsightly appearance.

The exterior of a pipe or passage is covered with a non-conducting material A, such as flannel, felted hair, or wool, and over this is placed thin sheet metal B, preferably zinc, or galvanized iron. The sheet-metal casing may be secured by bending one edge *b* inwards, and the other edge *b'* outwards, as shown. Both of the edges may be bent outwards, and a strip of metal, suitably shaped, provided to hold the edges together. A strip of sheet metal may be made to encircle a flanged connecting piece, and plastic, or other conducting material, placed between the flanged piece and the sheet metal. Two or more pieces, placed circumferentially, or girth-wise, and connected together, may be used for the flanged connecting pieces, and for the pipes.



17,755. Hart, J. A. Aug. 17.

*Heating air.*—Relates to apparatus such as that described in Specification No. 20,358, A.D. 1900, for use in ventilating workshops &c. with filtered, cooled or warmed, and moistened air, and consists in arranging the coir, coco-nut matting, or other moistened material in folds, depending loops, or a series of sheets, so supported as to constitute passages *d, e*, preferably widest at their open ends, for the incoming and outgoing air. The material *A*, Fig. 1, is arranged in loops, and is supported between the troughs *B, C* by

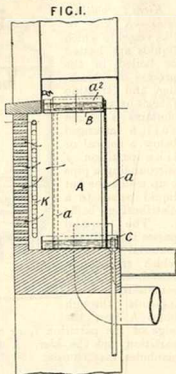


FIG. 5.

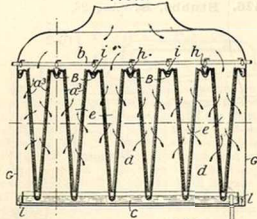
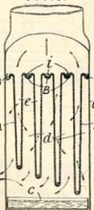


FIG. 11.



FIG. 9.



vertical rods *a*. It is supplied with water from the upper troughs by its ends *a²* being hooked into the trough, or by means of a wick. In the casing *G*, Fig. 5, the material in one length passes through troughs *B*, into which it is depressed by hollow rods *h* or solid bars *i*. Water is supplied under pressure from

taps in the pipe *b*. Fig. 5 also illustrates guide-plates *a²* to prevent the air from passing anywhere except through the moistened coir or matting, and wheels *l* on which the apparatus can be run in and out of the casing. The loops may be arranged lengthwise or widthwise of the casing, horizontally or vertically, and some or all of the ends of the loops may be at different levels, as shown in Fig. 9. Fig. 11 illustrates the use of a trough *B²* to provide water, with a narrow opening *b²* and deflectors *b²* to spread the water. In this case the material *A* is supported on solid bars *i²* and the trough may be divided longitudinally into compartments. The supports may consist of perforated rods with a deflector, and extra cross-rods may be used as supports. The moisture can be conveyed to the coir &c. by the air, or by spraying, and the water running off the material is passed away through perforated trough *C*. Coils *K*, as described in the prior Specification, may be used for attemping the entering air.

17,790. Dunham, C. A. Aug. 17.

FIG. 1.

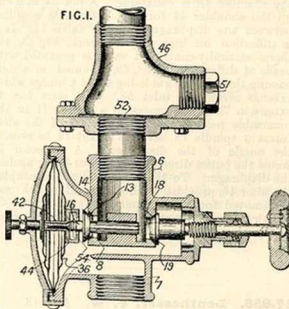
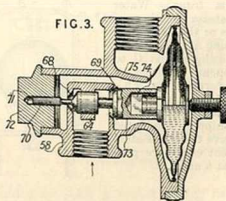


FIG. 3.

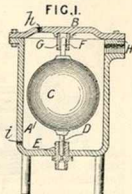


*Steam traps.*—Relates to a steam trap in which

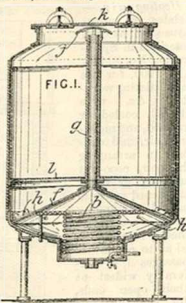
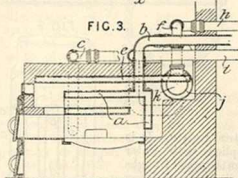
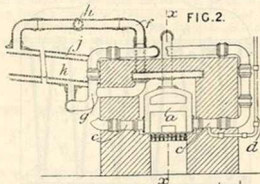
the contraction or expansion of a diaphragm chamber, containing a fluid sensitive to changes of temperature, opens or closes the discharge valve. It is especially adapted to be used in connection with steam engine separators, heating systems, radiators, steam cookers, or where a "regular" trap is not available. One form, for low pressure or vacuum work, has a valve port 13, which is closed by a thermostatically-controlled valve 14, and a bye-pass port 18, which is closed by a screw-down valve 19. Both ports are formed in a "bridge" 8, between the inlet 6 and outlet 7, which latter are co-axial. The valve 14 has a short stem 16, which is made to fit the socket of a tool, adapted to rotate the valve for the purpose of grinding it to its seat without removing the trap from the pipes. The thermostatic device consists of a diaphragm chamber 36, preferably formed by sweating the edges of two plates together, lapping and soldering them with silver solder. It is filled with some liquid sensitive to changes of temperature, such as ammonia, and held peripherally between the casing and its cover. A filling-nozzle 42, provided with a screw-plug, has a shoulder 44 secured to one plate of the diaphragm chamber, and terminates near the other plate so as to prevent the chamber from collapsing. A pin 54 in a cup on the shoulder 44 forms a detachable coupling between the diaphragm and the valve 14. In a modification for high-pressure work, Fig. 3, the thermostatically-controlled valve is provided with heads of different area 68, 69, mounted on a stem passing through the guide-lug 64 of a bridge which extends across the inlet 58. The stem has an extension 70 which moves in a socket 71 in the removable head 72. The other end of the stem forms a spindle 73 having a socket 74 to receive the nozzle of the diaphragm. A deflector 75 across the outlet directs the steam or water against the diaphragm. To the inlet 6, Fig. 1, is coupled the filter 46, provided with a plug 51, which may be removed for cleaning purposes. A strainer 52 of wire fabric or metallic copper is placed across the opening of the filter casing.

**17,856. Leuthesser, F. W. Aug. 18.**

*Steam traps.*—Water from steam heating-apparatus or the like enters the casing A' by a pipe H; and causing a float C to rise, opens a discharge valve formed by the stem D and a nipple E. The removable cover B has a nipple G adapted to receive the guide-stem F. Vent cocks are provided at h and i.


**18,075. Brennan, J. Aug. 21.**

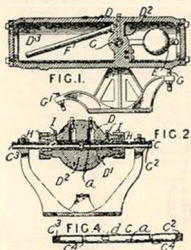
*Kiers; boiling-pans.*—A kier or like vessel in which liquids are heated or boiled in the process of bleaching and treating fabrics or the like, contains a steam coil b arranged below a conical or like partition f surrounding a pipe g up which the hot liquid passes to a distributing-baffle j. The liquid passes through the material treated, which rests on a false bottom l, and returns to the heating-coils through holes h near the edge of the partition f, or a space between this partition and the kier. A lid k, provided with manholes, may be used.


**18,426. Stubbs, R. Aug. 26.**


*Heating water.*—Relates to hot-water apparatus of the kind described in Specification No. 16,775, A.D. 1901. A supplementary boiler in the form of a closed tray with its own water supply and circulating-system is placed above the furnace of an ordinary boiler in the course of the products of combustion. Fig. 2 shows a front view of the

apparatus, partly in section, Fig. 3 shows a section on the line  $x-x$ , Fig. 2. An ordinary boiler  $a$  is arranged in a suitable furnace and having flow and return pipes  $b, c$ ;  $d$  is the water-supply pipe for the boiler. The auxiliary boiler or tray is shown at  $e$  overlying the furnace and having its own water circulation by the pipes  $f, g$ , which lead to the pipes  $h, i$ , after communicating with the annular jacket  $j$  surrounding the flue  $k$ . A water supply for the tray  $e$  may be provided in any convenient spot.

18,851. Morgan, J. G. Sept. 1.



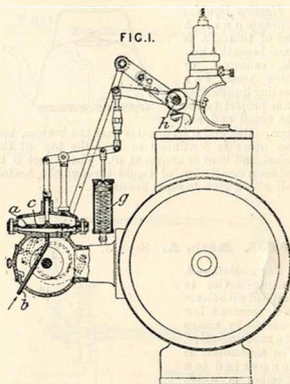
*Steam traps.*—The water of condensation passes through the hollow pivot C, arranged in the partition  $D^1$ , of a rocking vessel D, into the chamber  $D^2$ , causing that chamber to fall against a set-screw  $G^1$ . The steam inlet is by this movement closed, and the pipe F brought into communication with the discharge outlet in the pivot. When empty the vessel D is caused to rock back till it rests on the screw G by the counterweight E. The hollow pivot C is divided by a partition into a steam inlet  $C^1$  and a water outlet  $C^2$ , which have ports  $a, d$  communicating by corresponding ports and passages in the sleeve  $D^1$  and partition  $D^2$ , with the top of the chamber  $D^2$  and the pipe F respectively. The ports  $a, d$  are so arranged that when one is in register with its sleeve port the other is cut off. Stuffing-boxes H prevent leaking. Lateral shifting is prevented by screws I passing into grooves  $C^1$  in the pivot.

18,932. Mennig, E., and Picard, G. D. Sept. 2.

*Heating by steam circulation.*—The pressure in a steam heating-apparatus, supplied from the receiver of the last cylinder but one of a compound or multiple-expansion engine, is kept approximately

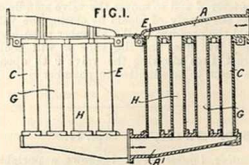
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constant by means of apparatus in which variations of pressure in the heating-apparatus regulate the admission of steam to the last cylinder. A pipe  $b$  admits steam from the receiver to the underside of a flexible disc  $a$  of leather, caoutchouc, or other material, carrying a plate  $c$ , and fixed inside a



steam-tight chamber. The movement of the diaphragm is transmitted by levers to the detent arbor  $A$  of the releasing-gear of a variable-admission valve of the last cylinder, so that more or less steam is admitted to this cylinder according as the pressure in the heating-apparatus rises or falls. A spring  $g$  controls the pressure at which the diaphragm is raised.

18,942. Green, F. W. Sept. 2.



*Heating air.*—Air is heated during its passage through a number of pipes C, G, H, connecting headers A, A'. Each of these headers is gradually

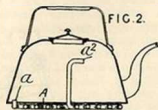
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reduced in cross-section from the first pipe U to the last one E, beyond which it is radiated. Eddying is thus prevented.

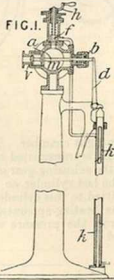
19,037. Brown, J. H. S. Sept. 4.

*Heating liquids; boiling-pans.*—A coil of tubing A is fixed beneath a kettle, saucepan, or other vessel for heating liquids. Its ends project inside the vessel and are open. One end *a* terminates near the bottom, and the other is continued to near the top of the vessel, and bent as shown at *a'*. The object is to induce a circulation of liquid through the heated coil with a view to rapid heating.



19,098. Roth, A. Sept. 4.

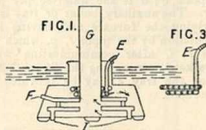
*Thermostats.*—A heating device is supplied with steam at a constant low pressure by means of a reducing-valve. The thermostat is connected to a chamber *m* which is supplied with steam by the valve *v* connected to a high-pressure steam pipe. When the pressure of the steam in the chamber *m* exceeds a definite value, it causes a valve *f* to open and to allow steam to pass through a pipe to a tube *k*, which, when heated by the steam, expands and turns the angle-lever *d* and so moves the valve spindle *a* and checks the supply of steam by closing the valve *v*. Should the pressure in the chamber *m* be low, the valve *f* will close and the tube *k* will cool and contract, thus allowing the valve *v* to open and more steam to be admitted to chamber *m*.



19,609. Sweet, A. Sept. 11.

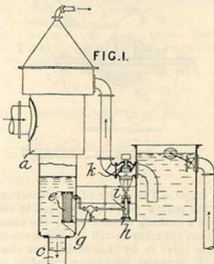
*Heating liquids.*—Fig. 1 shows a portable or partly-submerged gas heating-apparatus, a modification of that described in Specification No. 14,360, A.D. 1887, intended especially for heating baths, but also for heating liquids in general. An annular

burner E, having a small lower and a large upper ring, is used, the combustion products taking the course indicated by the arrows and escaping by



the outlet G. The water, or other liquid, circulates through the coil shown, entering by the inlets I at the bottom and escaping by the outlet F at the top.

19,623. Balcke, H. Sept. 11.



*Thermostats.*—For regulating the temperature of liquids, more particularly of the water from a central condensing plant, thus enabling a constant vacuum to be maintained, a cylinder *e*, containing a liquid with a high coefficient of expansion or easily volatilized, such as benzene, toluol, turpentine, petroleum, sulphurous acid, &c., is placed in the outlet pipe for the water or in the vacuum conduit, and the liquid or vapour is made to control the supply of condensing-water either by means of a valve or by acting on the governor of the pumping-engine. In Fig. 1, the cylinder *e*, fitted with pipes through which the water passes, is shown fixed in the outlet pipe *c* of a counter-current condenser *a*, and connected with a cylinder *h*, the ram *i* of which operates the valve *k* in the water-supply pipe. A pressure-transmitting device *g* is preferably interposed between the cylinders *e*, *h*, which enables water to be used in the latter cylinder.