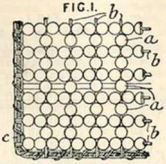
19,663. Delaspée, J. Sept. 12.

FIG. 4.

FIG. 1.



Non-conducting coverings.—A network of matting is formed of old corks or cork of little value cut to the same thickness and to equal lengths. The corks *a* are bored and provided with metal linings or ferrules *f*, Fig. 4, and are united by wires *b*, Fig. 1, either directly in line with one another or in a decorative arrangement. The corks may be angular instead of circular in section. The ends of the wires are bound to a frame *c* of wood, metal, tubular material, &c. The cork may be coloured, varnished, or stained. The network, secured in suitable frames, may be employed for making non-conducting covers for steam cylinders and pipes, in which case the cork matting is surrounded by a smooth outer casing.

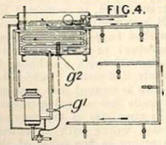
19,760. Cleghorn, J. P. Sept. 14.

Heating liquids; heating by electricity.—According to the Provisional Specification, wine, beer, or oil, packed in barrels, is heated for preserving and maturing purposes by inserting electric glow lamps through the bung-hole, a syphon or a bulb or expansion valve being arranged to allow for expansion of the liquid.

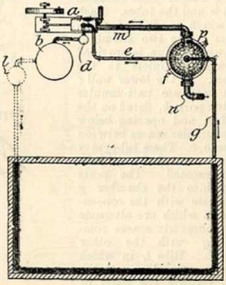
20,076. Junkers, H. Sept. 17.

Heating water.—In hot-water supply systems, the water may be heated by direct circulation through a gas heater, or by a coil placed in the tank and connected at the ends with the heater, as shown in Fig. 1. The latter arrangement is particularly applicable where the water to be heated contains a large proportion of lime. The temperature of the water is kept constant by a thermostat placed in the tank or pipes and connected with the gas cock of the heater. Preferably, the thermostat is placed at the part where the cold water enters. Instead of the hot-water tank being open, it may be closed and connected with a cold-water cistern above; or it may be connected directly with the water-supply pipe, in which case there is a pressure in the system.

FIG. 4.



20,168. MacKenzie, J. W., [*Svensson, C.*]. Sept. 18.



Heating buildings &c.; heating water.—Houses, offices, shops, factories, theatres, libraries, schools, &c., are warmed by the circulation of water, which is heated by passing through the cylinder jacket of an explosion engine, and afterwards further heated by the waste gases from the engine. The Figure shows a complete water heating and circulation system, in which water from a tank *b* enters, through a pipe, into the jacket of the cylinder *a* of an engine, into which it is forced by the pump *d*. The water circulates from the bottom to the top of the jacket, and is led away by a pipe *e* into the bottom of a heater *f*, rises through tubes *p* in this heater, and finally passes through the pipe *g* into the heating-pipes into the building. The combustion products from the engine are led by a pipe *m* to the top of the heater *f*, into which they pass, surrounding the water pipes *p* and escaping at the bottom by the pipe *n*. After heating the building, the water may pass through a cooler *l*, and thence again into the cylinder jacket, or it may be used for other purposes. More than one heater *f* may be used. The water and the combustion products may come into actual contact in the heater *f*, the tubes *p* being dispensed with. According to the Provisional Specification, a separate outlet for the water condensed from the combustion products is provided in the heater *f*. The heater acts as a cushioning-device for the explosions.

20,175. Brackett, F. W., and **Brown, P. Pryce-.** Sept. 19.

Heating liquids; heating gases.—In an apparatus consisting of two hollow heads, which are connected by concentric tubes so that the fluid to be heated and the heating-fluid flow in alternate annular spaces in their passage from one head to the other, means are provided for ensuring a tight joint between the heads and the tubes. Each head, which is divided by a partition *e* into two chambers *g*, *h* of unequal size, is provided with separate inlets to the chambers. In the lower wall *c* of the head are part-annular concentric ports *k*, flared on the upper face and opening below into the annular spaces between the tubes *a*, *b*. These tubes may be plain or annularly or helically corrugated. The ports opening into the chamber *g* communicate with the concentric spaces which are alternate to the concentric spaces communicating with the other chamber *h*. Ribs *l*, in which are passages coinciding with the ports *k*, connect the parts of the wall *c* intermediate of the ports *k*. Other strengthening-ribs *x*, *y* may also be provided. The ends of the tubes *b* fit into annular concentric recesses *n*, and are held apart, when assembling the apparatus, by corrugated metal strips *v*, Fig. 4, which are placed between successive tubes. The upper wall of the upper head is provided with recesses *o*, the floors of which serve as bearing-surfaces for springs *p*. The lower wall of the lower head has similar recesses in which fit nuts or bolt heads on the ends of bolts *s* connecting the heads. Inspection openings *u* are also arranged in the upper head.

FIG. 3.

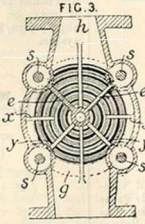
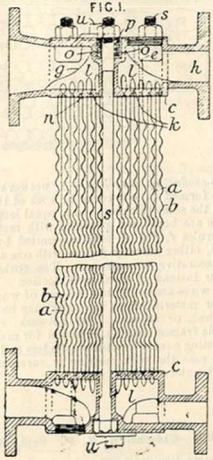


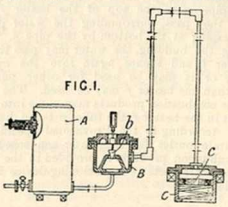
FIG. 4.

FIG. 1.



20,310. Grouvelle, J., and **Arquembourg, H.,** [*trading as* Soc. J. Grouvelle et H. Arquembourg]. Sept. 21.

FIG. 1.



Thermostats and other apparatus for automatically regulating temperature.—Relates to pneumatic apparatus for use as a relay in thermostats and the like. In the arrangement shown in Fig. 1, the apparatus, the movements of which are to be transmitted, is connected to a valve *b* in a casing B, communicating on one side of the valve seating with a supply of compressed air maintained at a constant pressure in a reservoir A, and on the other side with a cylinder C fitted with a spring-controlled piston *c* which acts as a receiver. The valve is conical and very small and light, and its spindle has an enlargement of the same or about the same size as the valve seating, which enlargement works with an extremely slight play in an aperture in the cover of the casing B. With the valve wide open, approximately the full pressure in the reservoir A is transmitted to the receiver, but with only a partial opening a reduced pressure is transmitted owing to the leakage past the spindle, and the piston *c* of the receiver is consequently made to occupy varying positions

corresponding with varying positions of the valve. A reservoir in which a constant reduced pressure is maintained may be used in a similar manner by inverting the valve and the receiver. As an example of the application of the apparatus, the valve may be connected to a thermometric Bourdon tube placed where a regulated temperature is required, and the receiver may be connected with appliances for regulating the temperature.

20,501. Jergitsch, F. Sept. 23. *Drawings to Specification.*

Heating buildings &c.—Kennels or cages for dogs &c. may be heated by putting warm water, ashes, &c. in a tray mounted on rollers below the main frame.

20,765. Christon, C. F. Sept. 26.

Boiling-pans.—Cooking-ranges as used in fried-fish shops and the like, and boiling-pans used in laundries &c., are provided with covers or hoods for conducting away steam and fumes to the chimney. Figs. 1 and 2 show the application of the invention to a cooking-range. The cooking-pan F is situated so that the furnace gases are in contact with it. It is enclosed by a cover H, which has an inclined top with doors, and the steam escapes from the cover to the chimney B× by means of the flue J. An opening is provided in the front of the cover to allow any steam in the room to pass away to the chimney.

FIG. 1.

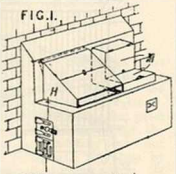
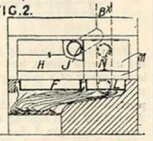


FIG. 2.



20,975. Barker, A. H. Sept. 30.

Heating water.—Apparatus for heating water and circulating the heated water comprises two vessels placed at different levels, and connected by a system of pipes through which the heated water is caused to flow by gravitation from the higher to the lower vessel, from which it is forced to the higher vessel by an automatically-regulated pump, the heater, which may be of any convenient type, being placed in the line of the rising or circulating pipes. Fig. 1 shows one form of the apparatus in which water from the upper vessel *a* flows through a surface heater *d*, having a steam inlet *e*, and steam outlet *f*, and after passing through a system of circulating-pipes *c*, enters the lower vessel *b*, in which is a float *i*.

FIG. 1.

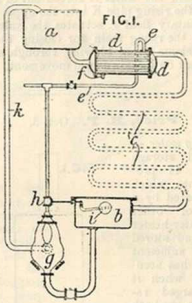
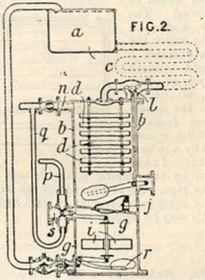


FIG. 2.



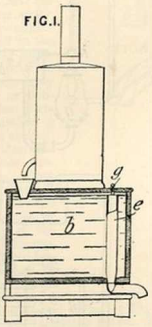
When the water in the lower vessel *b* reaches a predetermined level, the float opens the valve *h*, which admits steam to a pump *g*, and forces the water, which has entered the pump from the lower vessel, up the rising pipe K to the upper vessel. In a modification of the apparatus, shown in Fig. 2, the lower vessel *b* is combined with the heater, the water from the circulating-pipes *c* being admitted at the top of the vessel *b*, where it falls upon a series of perforated trays *d* exposed to low-pressure steam from the pipe *n*. The supply of water to the vessel *b* is regulated by a float-actuated valve *l*. The vessel *b* is in communication, by means of a valve *j*, with a pump or ejector *g*, which is supplied with low-pressure steam by a pipe *q*, and high-pressure steam by a pipe *p*. The pump *g* and the

heater *b* being supplied with low-pressure steam, when the weight of water in the heater is sufficient, the valve *j* opens and admits water to the pump *g*. The float *i* then rises and shuts off the low-pressure steam and admits high-pressure steam through the valve *s*, and the water is forced out of the pump, through the rising pipe K into the upper vessel. A supplementary float *r* actuates the valves at the outlet to the rising main for closing the outlet to prevent steam from blowing through, should the float *i* stick on its downward movement.

21,248. Price, H. F. Oct. 3.

Heating water.—A closed storage chamber is provided, into which water heated by a geyser or other rapid water-heater is led, and stored until a sufficient quantity has accumulated, when it is discharged rapidly into the bath or other vessel to be heated. The Figure shows a form in which the storage chamber *b* is placed beneath the geyser or other heater, so as to receive the deflected heat from it. The outlet is controlled by a tube *e*, operated from without by the handle *g*, which acts also as an overflow pipe. An ordinary large tap with separate overflow arrangements may be used instead. The reservoir may be lagged.

FIG.1.



21,292. Schnitzer, H. Oct. 3.

Heating by chemical action or molecular combination.—Consists in utilizing the heat evolved when chemical action takes place, for cooking or warming food and other materials. The apparatus is especially applicable for military purposes, and consists of an outer vessel *a*, Fig. 3, containing the chemicals, and an inner vessel *b* for containing eggs to be boiled, or milk to be warmed, &c.; or a bottle, flask, or the like containing the material to be heated, may be placed in the inner vessel *b*. Or the vessel containing the chemicals may be inserted in the field kettle or other food receptacle. In a modification, the vessel *a*, Fig. 4, contains one of the ingredients, such as water, and is made with a narrow neck in which a packet or cartridge *b*¹ containing the other ingredient or ingredients, such as zinc chloride or caustic potash, is inserted so as to form a stopper. When required for use, the contents of the cartridge are emptied into the vessel. The apparatus may also be employed for medical purposes, in cases where it is necessary to apply heat to various parts of the body, and then consists of a suitable box having two compartments, one containing water and the other the chemical ingredients; or the chemical may be contained in a cartridge forming a stopper to the water compartment.

FIG.3.

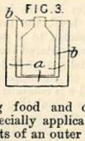
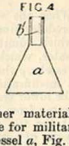


FIG.4



21,293. Laurenius, C. E. Oct. 3.

FIG.1.

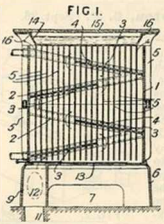


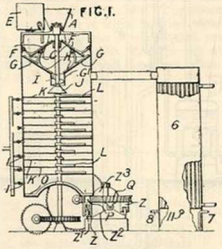
FIG.2.

Heating buildings &c.; heating air.—A radiator for use with steam, hot water, hot air, or the like is composed of a rectangular shell 1, Figs. 1 and 2, made in sections which are bolted together, and provided on opposite sides with hollow projections 2 arranged in a zig-zag manner so as to form continuous passages 4 for the downward circulation of the heating fluid. Vertical ribs or gills 5 are formed on the inside and outside of the shell, while ribs 3, arranged as baffles, extend between the projections 2 for certain parts of their length. Air from the room enters the hollow base 6 through openings 7 in the sides and passes upwards into the radiator, where it is caused to circulate backwards and forwards between the baffles 3 before being again discharged into the room through the openings near the top. Fresh air from a conduit 11 can also enter the radiator through a separate chamber 9 at one end of the base 6; or the fresh air may be supplied through an opening 12 in the side of the chamber. By means of a sliding damper 13, the supply of fresh air may be entirely cut off and air from the room only admitted, or *vice versâ*. The heated air as it leaves the radiator is moistened with water vapour issuing from holes 16 in the sides of a pan 14 containing water. The pan is closed at the top with a slab 15 of marble or other suitable material. If desired, the continuous

passages 4, for the circulation of the heating fluid, may consist of bent pipes fitted to the inner sides of the shell.

21,300. Shedlock, J. J. Oct. 3.

FIG. 1.

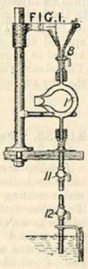


Heating by air circulation; heating by steam circulation.—In mixing and moulding machinery for preparing fuel briquettes, the materials are heated by the circulation of superheated steam, carbon dioxide, or other inert gas. The hot gases are introduced between the plates K through the pipes 1 and pass through the condenser 6 and out by the pipe 11 to be re-heated. Any loss by leakage is made up from a continuous source. If steam is used, the water is removed through the pipe 7 and the distillates through the pipe 8.

21,371. Macfadyen, W. A. Oct. 5.

FIG. 2.

FIG. 1.



Non-conducting coverings; heating liquids; boiling-pans; bed-warmers; foot-warmers.—A chamber containing a vapour with adiathermic properties, preferably aqueous vapour, is combined with a vacuum chamber so as to form a jacket or screen for heat. Where one of the above chambers already exists as part of any machine, manufacture, or contrivance, the other chamber may be combined therewith. A chamber containing a vapour with adiathermic properties, preferably low-tension aqueous vapour, may be used alone. These methods of jacketing may be applied to furnaces, stoves, ovens, boilers, ranges, fire-places, cooking-stoves, steam, hot-air, and hot-water pipes; motors in which expansion is caused by combustion; kettles, pots, pans, and other vessels in which liquids are heated, together with the lids of the same; tea-pots, coffee-pots, water jugs, soup-basins, milk-jugs, hot-water cans; vapour-baths, hot-water baths, foot and bed warmers, incubators, artificial or foster mothers; lamp chimneys, lamp, gas, and other globes, incandescent electric-light bulbs; dish covers, toast racks, and other food receptacles; the walls of fireproof safes and armour-plates; refrigerators, ice-houses, ice-chests, chilling and freezing chambers, heat-proof pipes for the conveyance of cold vapours or liquids; plates for walls and roofs of buildings; cases for musical and other delicate instruments and the like. Fig. 1 shows an apparatus for exhausting air from the outer chamber 1 of an incandescent electric lamp. The chamber 1 is provided with two tubes, one of which is connected through a stuffing-box to a funnel fitted with a cock 8, while the other is connected through a stuffing-box with a pipe which is fitted with cocks 11, 12, and extends into a water tank. The air in the chamber 1 is displaced by water supplied through the funnel, which is then allowed to flow away so as to leave a Torricellian space, containing water vapour, in the chamber 1. Fig. 2 shows a vessel provided with an inner vacuum chamber and an outer chamber containing water vapour. In this arrangement, the water vapour is to a great extent removed, after a vacuum has been produced therein, by connecting the outer chamber to an airtight globe which is cooled so that the water vapour condenses therein. Fig. 4 shows a steam-engine cylinder in which the lagging consists of a double-chambered annular glass jacket cast in halves, which fit round the cylinder and are botted together. Each chamber is formed with two tubes which are employed in producing the vacua. Fig. 5 shows a triple-walled plate for constructional purposes, in which three iron plates are joined together by leaden end plates and wooden side pieces faced with lead. The chambers, each of which is fitted at the top and bottom with the apparatus shown

FIG. 4.

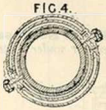


FIG. 5.

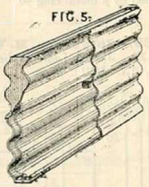
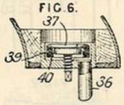
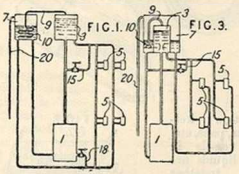


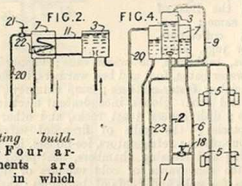
FIG. 6.



on an enlarged scale in Fig. 6, are exhausted through the pipe 36, Fig. 6. The pipe 36 is afterwards closed by screwing down the mushroom head 37 which carries an india-rubber ring 39 stiffened by a metal ring 40.

21,389. Jorgensen, H. V., and **Sorensen, C. H.** Jan. 9, [*date applied for under Patents Act, A.D. 1901*].

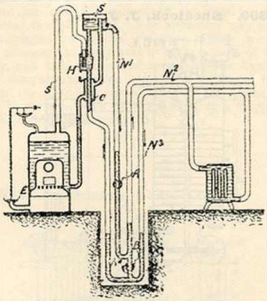




Heating buildings.—Four arrangements are shown in which heated water from a boiler 1 passes to a hot-water reservoir 3, thence to radiators 5, and back through another reservoir 7 to the boiler. In the arrangement shown in Fig. 1, the reservoirs 3, 7 are separate but communicate by a pipe 9, terminating in an open-ended condensing-coil or noiseless water-heater. The reservoir 3 may however be wholly or partly inside the reservoir 7, as shown in Figs. 3 and 4, the pipe 9 then terminating in a noiseless water-heater 10, or joining the pipe 6 leading from the radiators to the reservoir 7. Fig. 2 shows an arrangement in which a condensing-pipe 11, provided with an air outlet 22, passes from the reservoir 3 through the reservoir 7 and back again. Bye-pass circuits 15, 18, fitted with valves which open when the water pressure exceeds a limit, provide a short circuit when the speed of the water or the pressure in the pipes becomes too great. Where the circulation is not brisk, a pipe 23 enables the water to circulate more quickly through the pipe 2 and boiler. An overflow pipe 20, fitted with a safety-valve 21, may be provided.

21,406. Beck, A. B. Oct. 5.

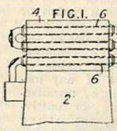
Heating buildings &c.; heating by water circulation; heating water.—In that class of hot-water heating-apparatus in which the circulation is accelerated by steam, pumps, injectors, or the like, the temperature of the hot water can be controlled, after it leaves the heater, by mixing with it a

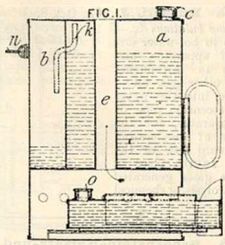


portion of the cooled water. For this purpose, a cross-connection N^4, containing a valve B, is inserted between the main flow and return pipes N^1, N^3 respectively. A valve A is also inserted in the pipe N^1 connecting the pipe N^2 with the hot-water cistern S. Normally, the valve A is wide open and the valve B closed, the water then passing to the radiators at the same temperature as it leaves the cistern. By closing the valve A partially and opening the valve B, a portion of cooled water is drawn into the pipe N^2, thereby cooling the hot water. Instead of a valve B of the type shown, a check valve may be employed. Further, the connection between the pipes N^1, N^2 may be formed into an injector so as to increase the sucking action in the latter pipe; the pipe N^2 may then be reduced in height. The Figure shows the invention as applied to a closed system in which the water is heated in a receptacle by steam from a boiler E. The steam rises with the water into a cistern S, thereby accelerating the circulation.

21,533. Pemberton, W., and **Dyson, J.** Oct. 7.

Heating water.—Relates to boilers for hot-water-heating apparatus. To utilize fully the heat of the gases, the flue-pipe 6 is passed tortuously through the water-chamber 4 which may be connected with the main boiler 2 or be used independently thereof. Suitable joints, bends, and cleaning-holes are provided in the flue-pipe.



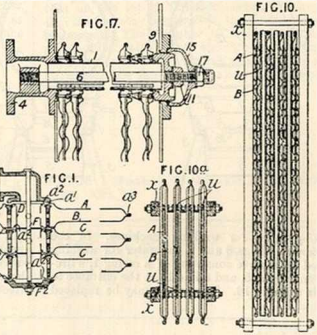


21,576. Hentschel, M. F. Oct. 7

Steam traps.—In a portable steam generator, a condenser trap *b* and steam pipe *k* connected therewith, as well as the central flue tube *e*, are arranged within a flat chamber. The steam generated in the chamber *a*, which is filled through the aperture *c*, passes by the pipe *k* to the condenser trap *b*, whence it escapes through the nozzle *n*, which may be unscrewed to allow water to be removed from the trap.

21,677. Fouché, F. June 5, [*date applied for under Patents Act, A.D. 1901*].

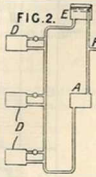
Heating buildings; heating water, gases, &c.—Relates to improvements in the construction and to the assembling of, the parts of metal radiators or apparatus which serve to effect an exchange of heat between liquids, vapours, or gases circulating in, or about, the apparatus. The parts may take several forms while their methods of connection may vary similarly. In Fig. 1, the metal plates A, B, of which the radiators are formed are stamped or dished out in such a way that, when superposed to form a battery, spaces C are left between them. The outer joints a^3 are made by folding, soldering, or riveting. To form the joints at the ends where the chambers communicate with each other, the plate A of each radiator is formed with an annular groove a^1 while an annular projection b^1 is formed upon the plate B. Further, the internal lip a^2 of each plate is rounded to receive an aperture thimble D which forms the passage uniting the chambers of the apparatus. The internal distance-ring E affords a seating for the grooves and projections when the chambers are secured together as by the rod F with the end-caps F^2 having faces corresponding to the grooves and projections. The joints between the internal lips of the openings of the plates and the thimble are made by expanding, soldering, or the like. In certain cases, the thimbles may be dispensed with. The spaces between the heads of the several chambers may be increased by the interposition of external distance-rings of suitable conformation. When the distance-rings are plain, the curved lips a^2 may hold them in place. Figs. 10 and 10*a* show in section two sectional views at right-angles of an aggregation of plates A, B with an external frame *x* to resist outward pressure, and internal tie-bars *u* to withstand inward pressure. Other methods for stiffening the plates consist of stamping the plates with coincident bosses through which pass screws or rivets. Fig. 17 shows another arrangement of assembled chambers, the chambers being easy of removal or replacement. The chambers at their ends are threaded upon guide-tubes 1 which are formed with longitudinal slits. The tightening-rod 6 is provided with the caps 15, 9, and with corresponding nuts and suitable washers, the nut 17 screwing upon the thread which serves the inner nut 11. The end opposite to the nuts is screwed into the web of the opening to the radiator 4.



21,692. Russell, J. N. Oct. 8.

Heating buildings &c.—Relates to hot-water circulation apparatus, and consists in introducing air, or other gas, under pressure, into the water in the ascension pipe of the apparatus, for the purpose of accelerating the upward flow of the water. In the place of air, the gases generated by electrolysis, or chemical action within the ascension pipe or in a separate vessel, may be used. The gas, which may be heated, enters the apparatus by the pipe F, either above, below, or into the water heater A. The pressure in the vessel containing the gas may be raised by a motor arranged to come into operation when the pressure falls below a certain point, and to cease working when the pressure rises above that point. In a modification of the arrangement shown, the hot water from the heater A passes first through the radiators or pipe coils D, and then rises to the tank E, the compressed gas being introduced during this last ascension.

FIG. 2.



21,753. Schornstein-Aufsatz-und Blechwaren-Fabrik, J. A. John, Akt.-Ges., and Ruschewegh, R. Oct. 9.

FIG. 8.

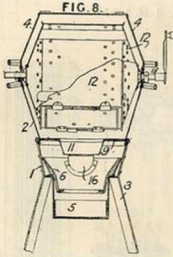


FIG. 9.

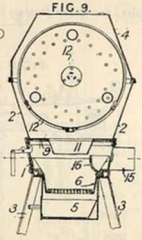
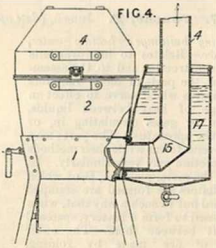


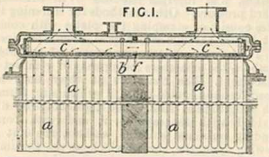
FIG. 4.



Heating water for washing machines. In the form shown in Figs. 8 and 9, the water for washing is heated by a stove consisting of a casing 1, a fire-box 6, an ashpan 5, and a flue 15 at the entrance to which is a baffle 16. This stove may be replaced by a gas stove. Fig. 4 shows a modified form of apparatus with a chamber 17 at the side in which water is heated, the flue 15 of the stove passing through it either as shown or in a horizontal direction.

21,950. Bjornstad, J. Oct. 12.

FIG. 1.

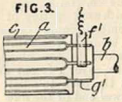


Heating gases; heating liquids.—Relates to apparatus for effecting exchange of temperature between fluids. The invention is described with reference to a steam superheater. Field tubes, immersed in hot gases, have their outer members connected to inlet and outlet compartments, and their inner members connected to a chamber extending within the inlet and outlet compartments. The outer members *a* are secured to the lower of two dished flange plates, which are bolted together so as to form an outer box *b*. The inner members are secured to an inner chamber *c*, made of longitudinal parts and end-pieces secured by bolts and nuts. The space between the inner chamber and outer box is divided by a transverse partition *f* into two chambers, one of which is fitted with the steam inlet, and the other with the steam outlet. Steam, entering one chamber of the outer box, passes down the outer members of one set of Field tubes, and up the inner members of the same set to the box *c*. From this box, the steam passes down the inner members of the other set of Field tubes and up the outer members to the other chamber of the outer box.

21,995. Brennand, J., and **Ferrand, F.** Oct. 13.

Heating by electricity.—A rod, tube, roller, &c. for singeing fabrics is composed partly or entirely of fireclay, porcelain, or other refractory material, and is heated by electricity passed through a conducting-strip wound helically around the roller and secured at the ends to rings against which brushes connected with an electric generator bear. In another arrangement, a number of conducting-strips *c* extend along the roller *a* parallel to its axis. These strips may be connected in series, and the two remaining ends connected to rings as before, or the strips may be connected as shown to commutator bars g^1, against which adjustable brushes bear so that the operative surface only of the roller may be tested. The conducting-strip may be embedded in the material of the roller &c., and may be formed of an alloy known as "Beacon" metal, or other metal or alloy not easily oxidizable.

FIG. 3.



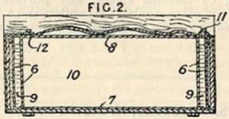
22,037. Hunt, F. M. Oct. 13.

Heating by steam circulation; heating by water circulation.—Relates to a composition used for covering steam and hot-water pipes to facilitate radiation of heat. It is made in two parts. A base is formed of $\frac{1}{16}$ oz. of powdered gum tragacanth or liquid gum or mucilage, 8 oz. of turpentine, $\frac{1}{4}$ oz. sperm, neats'-foot, seed, or other vegetable or animal oil, and 8 oz. of water, mixed thoroughly to form an emulsion. A body is formed by mixing 1 lb. of mineral, vegetable, or animal black and 5 pints of vinegar or other acid liquor, then adding gradually 16 pints of water and 8 lb. of graphite. The base and body are mixed cold and allowed to settle. The composition may be obtained in a solid form by pressing together powdered black, gum and graphite, moistened, if desired, with vinegar and water to which the base-forming ingredients are added. The whole is mixed together, pressed into moulds, and allowed to dry. The composition of the body for the solid form may be as follows:—20 lb. of graphite, $1\frac{1}{2}$ pint of vinegar, 2 lb. of mineral black, and $6\frac{1}{2}$ pints of water. By increasing the proportion of oil, the composition may be obtained in the form of a paste.

22,102. Nidever, R. M. Feb. 6, [*date applied for under Patents Act, A.D. 1901*].

Footwarmers.—A footstool, having a sloping top, is fitted with a metallic tank 9, having double walls 6, a bottom 7, and a top 8. Hot water is introduced into the tank through a filling-orifice which is closed by a screw plug 11. The wooden casing forming the footstool is provided with beading on its upper and lower edges which hold the tank in place, a layer of raw cotton or other non-conductor being placed between the walls of the tank and

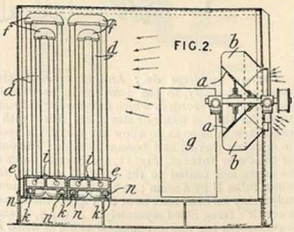
FIG. 2.



the casing. The bottom of the casing which supports the tank is hinged and is secured in a closed position by latches on the front of the stool. The casing is open-topped and is covered with carpet, that on the top of the stool being left loose, so that the feet may be placed on the tank underneath the carpet. The chamber 10 inside the tank may also be filled with water through an opening 12, the space between the double walls serving as an air-jacket. Or the double walls may be dispensed with.

22,105. Nesbit, D. M., and **Jennings, F. W.** Oct. 13.

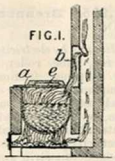
FIG. 2.



Heating air.—Air is drawn by a fan over a series of steam-heated tubes and afterwards used for ventilation, heating, or drying. The vertical air-heating tubes *d* are arranged in series on longitudinal cast-iron hollow bases *e*, preferably in parallel rows. In the form shown, four rows are set on each base, the outer and inner rows being connected by flat bottomed slightly-arched "siphons" or connections *f*, and the tubes *d* being oppositely-threaded at the ends for convenience

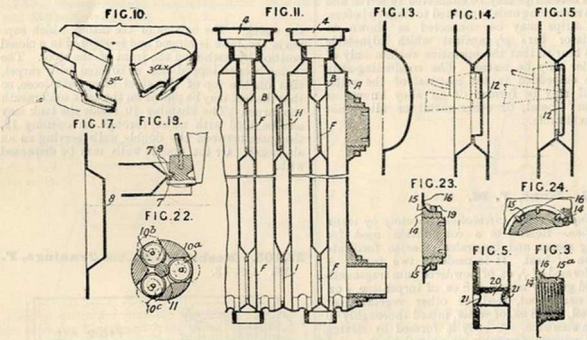
in fixing. Each base *e* is divided by a diaphragm and provided with connections *i* so that exhaust or other low-pressure steam may circulate through the heater. Collecting-channels *k*, with exits *u* for water of condensation, are provided under the bases, connected with them at the ends remote from the inlets and outlets *i*. The whole apparatus is contained in a casing strengthened with angle-irons, resting on cast-iron stands, and provided with louvres or other regulated air outlets and a door *g*. The heater may be used apart from the casing and fan.

22,198. Bailey, T. Oct. 14.



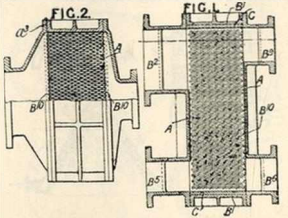
Boiling-pans.—A small flue *b*, built into the brickwork setting of the domestic copper or boiler *a*, conveys the steam or vapour to the chimney. The cover *e* is cut away at the back to admit the lower end of the flue.

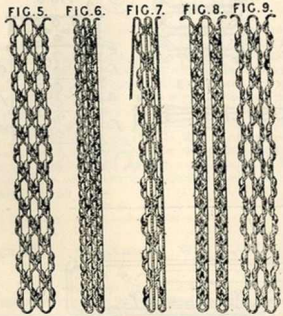
22,375. Kinnear, W. R. Oct. 16.

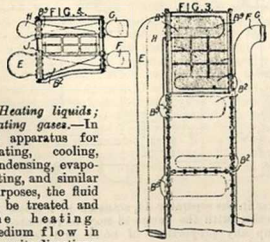


Heating buildings &c.; heating air.—Relates, more particularly, to the jointing in sheet-metal radiators of the form in which flattened or elliptical tubes for the hot water or steam are fitted with a concentric tube so as to allow the air of the room to circulate therein and become heated. The ends of the outer tubes A, Fig. 11, are bent inwards at an angle and united to the enlarged ends of the inner tubes B by a seam; or the ends of the inner tubes may be bent back as at 3^a, Fig. 10, the corner pieces 3^{a2} being fitted separately. A cap 4, having a perforated top and ornamental sides, is fitted in the upper ends of the tubes B. The connections F, I are made by stamping and punching the flat sides of the tubes into the form shown in Fig. 17. The edges 7, 9, Fig. 19, of the opposed openings 8 thus formed are then united by folding one over the other. This is effected by means of three grooved rollers 10^a, 10^b, 10^c, Fig. 22, carried in a suitable frame and forced outwards by a mandrel 11. In making the blind connections H, the metal of an outer tube is first stamped into the form shown in Fig. 13 and then pressed by suitable dies into the form shown at 12, Fig. 14. The boss 12 is placed in the opening in the adjacent tube and secured in position by a groove formed by the edges of the rollers as indicated in Fig. 15. The nipples 14, Figs. 23 and 24, for the attachment of the flow and return pipes, are formed with depressions 15 into which the metal of the boss 16 is pressed. The parts are then secured by soldering. The depressions in the parts 14, 16 may be formed separately so that they fit together when drawn up tight by the nut 19. The nipples may also be secured as shown in Fig. 3 by spinning the metal of the boss 16 into a groove 15^a. The tubes B may be fitted with tubular stays 20, Fig. 5, held in place by stamped bosses 21.

22,479. Alexander, J. S. L., and **Shiels, A.** Oct. 17.

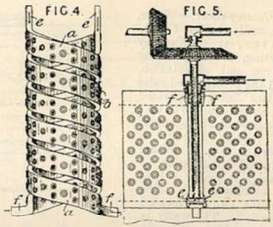






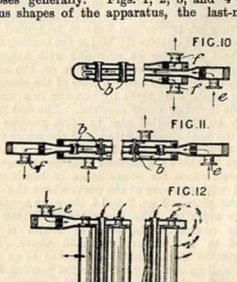
Heating liquids; heating gases.—In an apparatus for heating, cooling, condensing, evaporating, and similar purposes, the fluid to be treated and the heating medium flow in opposite directions, through alternate narrow chambers, which are formed by bending or folding upon itself in opposite directions, alternately, one or more sheets of metal having nodules upon one or both surfaces. In one form of apparatus, the folded sheet of metal A, Figs. 1 and 2, has its folds secured in vertical grooves B^{10} in an external casing, which is provided with inlets and outlets B^4, B^9 for the fluid to be heated, and with inlets and outlets B^2, B^5 for the heating-fluid. The sheet may also be provided with flanges a^3 which are clamped between a flange on the casing and a cover plate. The open ends of the chambers may be made fluid-tight by pouring in a mass C of white metal or other material. The end plates B^1 may be channelled also to form grooves into which the bent sheet is fitted, and the white metal then poured in. Figs. 5, 6, **7**, 8, and 9 show various manners in which the nodules may be arranged on the plates, which, for convenience in bending, are formed with a groove at the parts where the bend is to take place. Figs. 3 and 4 show an apparatus of large capacity. The apparatus is divided into separate compartments, each of which is constructed in the manner described above. Each compartment is detachably connected to an inlet pipe E and an outlet pipe F for the heating-fluid, and to inlet and outlet pipes G, H, conveying the fluid to be heated. Between the flanges of the pipes E, H and the flanges on the inlet B^9 and outlet B^9 respectively, are arranged distance-pieces J, which may be forced out of position and replaced by a blank stop plate, so as to put one compartment out of action, or allow one compartment to be removed. The water inlet may be provided with a filter, consisting of a casing in which a filter plate or strainer is mounted preferably at an angle to the bottom.

22,560. Heizmann, J. Oct. 19.

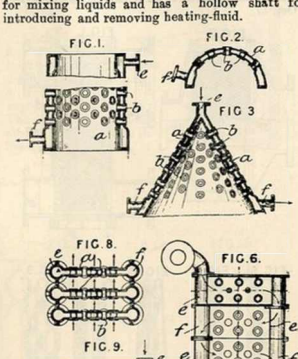


Heating gases and liquids; heating buildings.—Thin vessels or "radiators" of various forms are constructed of metal parallel walls *a* fastened at the edges and traversed by short cross pipes *b* air-tight and open at both ends. Influx and efflux pipes *e*, *f* are joined to the interior of the vessel, and the fluid to be heated circulates through the cross pipes. The forms of apparatus described are stated to be specially applicable for cooling liquids by means of salt water, or for regulating the temperature of fermenting liquids. The invention

may, however, be applied for heating and cooling purposes generally. Figs. 1, 2, 3, and 4 show various shapes of the apparatus, the last-named

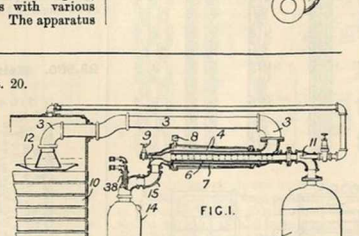


showing a pair of intertwined helices. Figs. 6 and 8 show a battery of flat vessels having influx and efflux pipes alternating at each end. Figs. 5, 9, 10, 11, and 12 show flat forms with various arrangements of partition walls. The apparatus shown in Fig. 5 is intended to be used also for mixing liquids and has a hollow shaft for introducing and removing heating-fluid.

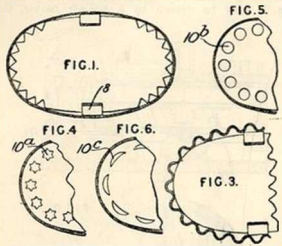


22,630. Holmes, I. V. Oct. 20.

Heating water.—Water, especially boiler feed-water, is purified by heating, the gases being driven out of solution, and the precipitated solid matter being separated by centrifugal action The general arrangement for feeding a boiler is shown in Fig. 1. Water is forced by a pump 13 through a heater 1 into an eliminator 4, which contains two perforated pipes 6, 7. The water is here heated by mixing it with steam injected at 11, and with hot water led from the boiler by the pipe 3. The gases liberated in the eliminator are drawn-off by the blow-offs 8, 9. The water then passes to a centrifugal separator 14, where it is freed from all suspended matter, and through the pipe 16 to the boiler. A worm in the separator 14, actuated by a motor 24, together with the pump 13 may be regulated to pump any proportions of boiler and feedwater through the apparatus.



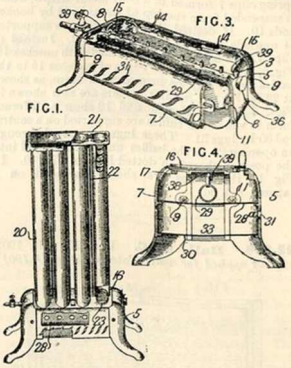
22,670. Thompson, W. P., [*Duplex Radiator Co.*]. Oct. 20.



Heating buildings &c., radiators for. Relates to modifications in the arrangement of baffles described in Specification No. 19,471, A.D. 1902. According to the present invention, the baffles are enlarged so as to make contact with front and rear portions of the tubes. The edges in contact may be serrated, as shown in Fig. 1, or they may be left plain and have openings of various shapes as shown at 10^a, 10^b, 10^c in Figs. 4, 5, and 6 respectively, formed near them. Fig. 3 shows a corrugated tube fitted with a baffle having a plain edge. The baffles are supported in notches in bars 8 at the sides of the tubes.

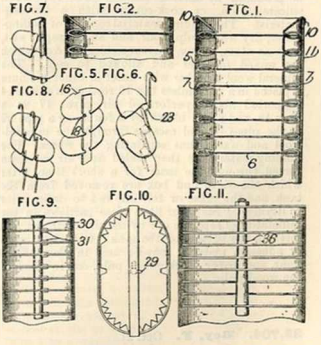
22,671. Thompson, W. P., [*Duplex Radiator Co.*]. Oct. 20.

Heating buildings &c., radiators for. Radiators heated by gas or oil are constructed in sections, which can be readily assembled and taken apart. Thus, the sides 7 and ends 8 of the supporting-base 5, shown in Figs. 3 and 4, are cast separately, and are connected together by bolts 9 passing through lugs 10, 11; the holes in these lugs are elongated to allow for unequal expansion. The legs may also be cast separately or in one with the sides 7 or ends 8. When cast separately, they are seated on flanges, and held in position by the bolts 9. The tubes 20, containing baffles 28, are fitted over plain nipples 23 on a lower tube-plate 16, and are held in position by an upper tube-plate 21, which is connected with the plate 16 by long bolts 22. The lower tube-plate rests on flanges 15 in the top of the base 5, and is provided on one side with curved lugs 17. These pass through slots in lugs 14 on the sides 7, and form hinges on which the tubes can be tilted bodily to give access to the burners. A spring catch 18 holds the plate 16 in a closed position. To prevent the floor from being scorched, the base 5 is traversed by baffles 28^a, 30, forming between them a chamber 33 in which the cold air, entering through perforations 31, is heated before passing to the burners through perforations in the baffle 28^a. For lighting, small apertures 38, with lugs 39 on which the match is struck, are



formed in the ends of the base 5. A conical plug 36, Fig. 3, holds the outer end of the burner pipe 29 in position.

22,672. Thompson, W. P., [*Duplex Radiator Co.*]. Oct. 20.

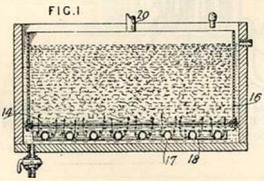


Heating buildings &c., radiators for. Various forms of holders for the baffles of radiators heated

by gas or oil are described. In the form shown in Fig. 1, the baffles 6 are held at opposite points in spring clips 7 formed in a bent metal strip 5, which is suspended from the top of the tube 11 by hooked ends 10. If desired, the baffles may be supported at one side only, as shown in Fig. 2. Instead of clips 7, the holder may be formed with notches 18, Fig. 5, which engage the edges of recesses 16 in the baffles; or it may be formed with steps, as shown at 23 in Fig. 6. Similar holders are also shown in Figs. 7 and 8. Figs. 9 and 10 show a different form in which the baffles are supported on a central rod 30 by lugs 31. These lugs are passed through an opening 29 in the baffles and then turned into the position shown in dotted lines in Fig. 10. In Fig. 11, the baffles are shown threaded on a tapered rod 36.

22,676. Hall, C. C. Dec. 20, A.D. 1902, [*date applied for under Patents Act, A.D. 1901*].

FIG.1



Non-conducting coverings.—A non-conducting felt is produced by mixing mineral-wool, rock-wool, silicate-cotton, or rock-cotton with a binding-material. The binding-material consists of boiling-water, dry wood pulp, flour, and an antiseptic salt, such as alum, borax, mercury chloride, &c., which are mixed together and allowed to cool. The mineral-wool together with water or other medium is placed in a bottomless box 16 resting on a sieve 14 supported above perforated air pipes 17 in a tank 18, and air is blown by a fan along a pipe 20 to the pipes 17, and escapes through the mineral-wool and water, thus separating the fibres. The binding-material is then added and air is again forced through the mass for a short time, after which the sieve and box are removed from the tank, and the mass or felt allowed to drain prior to drying. "Shot" or little glass particles in the mineral-wool separate out by the air treatment, and settle in the bottom of the tank. Other gluitinous or adhesive material may be used in place of the flour, and paper stock, straw pulp, &c. in place of the wood pulp.

22,704. Bey, F. Oct. 21.

Heating air and water.—A baking-oven is heated by hot air which circulates in conduits arranged in the baking-chambers and has been previously heated in a chamber by the furnace gases. In the case of a stationary oven, the baking-plate *b*, Fig. 1, may be driven by a hot-air motor, the

FIG.I.

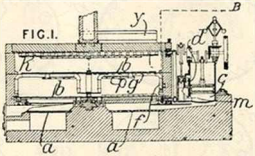
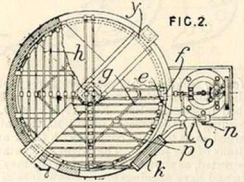


FIG.2.

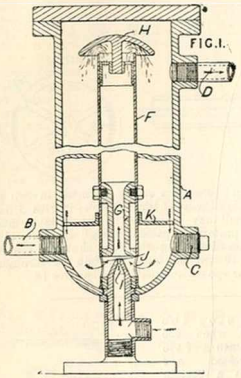


cylinder *c* of which forms the chamber in which the air for heating the oven is heated. The furnace gases pass from the left-hand grate *a* to chimneys *y*, Fig. 2, located diametrically opposite each other and at right-angles to the grate, while the gases from the other grate pass on one side direct to one of the chimneys *y*, but on the other side round a tongue which extends as far as the axis of the cylinder *c*. The air in the cylinder being thus heated, its piston ascends until the passage *d* is opened; simultaneously the slide valve opens the exit from the passage *d* into the valve-chest, and the hot air passes through the pipe *e* into a box *f* whence it traverses pipes *g* underneath the baking-plate *b*[1] and pipes *h* below the roof of the oven. The pipes *h* are arranged at right-angles to the pipes *g*, and the air passes by pipes *i* to a water-heater *k* and then returns by a pipe *l* and passage *m* to the cylinder *c*, the slide valve having opened the exit from the passage *m* into the valve-box. Steam from the heater *k* passes through a pipe *p* into the baking-chambers. The cock *n* is opened to allow air to pass through the pipe *o* into the pipes and cylinder, when starting the oven, but is afterwards closed. In another arrangement, box-shaped partitioned conduits are arranged below the drawplates and on the side and rear walls of the baking-chamber, through which hot air from chambers arranged above the firegrate passes.

22,734. Parkinson, T. Oct. 21.

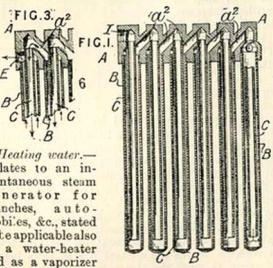
Heating liquids.—Size or other liquid is heated by direct contact with steam in a closed reservoir A. To promote circulation, the steam is admitted

through a nozzle I into a vertical tube F, furnished with ports J, a mixing-nozzle G, and a deflecting-head H. A baffle K is provided in the lower part



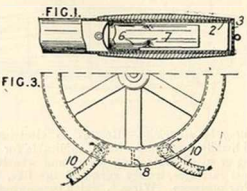
of the reservoir. The inlet for the cold liquid is at B or C, and the outlet for the heated liquid at D.

22,866. Nichols, E. I., Huntington, F. A., and **Hawes, B. C.** Oct. 22.



Heating water.—Relates to an instantaneous steam generator for launches, automobiles, &c., stated to be applicable also as a water-heater and as a vaporizer for the hydrocarbons used in lighting and heating and in explosion engines. It comprises a number of rows of vertical tubes B depending from the header A into the firebox and fitted with an inner circulating-tube C. Sloping passages a^2, formed in the header, connect the whole of the tubes in series as shown. The inlet and outlet openings I, E are situated at opposite ends of the header. Openings, not shown, are left in the header for the escape of the products of combustion.

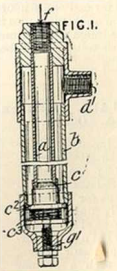
23,126. Williams, A. A. V. Oct. 26.



Heating-apparatus; heating by electricity.—The handles of velocipedes, motor cars, and motor cycles, and the steering-wheels and the like of vehicles or vessels, are heated by incandescent material, or by electricity, steam, or hot water and gases. In one form of apparatus, a tube 2, having a perforated end 3, is inserted in the handle. The tube contains an inner tube perforated at its end, and holding, by means of the clips 6, a block of slow-burning composition 7. In another arrangement, the hollow handle or steering-wheel is provided with an internal partition 8, on each side of which communications are made with flexible piping 10. In an explosion motor, the piping may contain the water used for cooling the cylinders or the exhaust gas. In steam motors, the exhaust steam may be used. An electrical resistance, placed either inside or outside the handle, may be employed in electrically-propelled vehicles.

23,154. Jeffcock, C. E., and **Yardley, W. H.** Oct. 26.

Steam traps.—In a steam trap of the expansion type, the steam passes both inside and outside the expansion pipe and the water-outlet valve is made adjustable. In one arrangement, the expansion pipe *a*, which is preferably made of brass, is attached to a socket on an outer tube *b* at the steam-inlet end *f*, so as to expand axially. The other free end of the tube *a* forms a valve seating for the valve head *c*, which is guided in a socket on the end of the pipe *b* by a washer c^3. A spring c^3, placed between



the washer c^3 and the valve, may press the valve away from its seating. The valve is moved towards, or away from, its seating by means of a screw g^1. The pipe b, which protects the expansion pipe and valve from injury, is provided with an outlet d^3.

23,161. Fliess, R. A. Oct. 26.

FIG. 3.

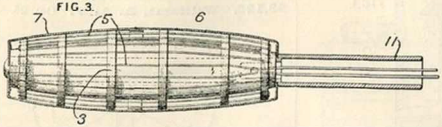
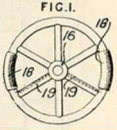


FIG. 1.



Heating by electricity.—Relates to electrically-heated handles and hand-wheels, applicable for the steering or speed controlling levers and wheels of horseless carriages, trolley cars, and the like, and for other purposes. Wires 5, which become heated when an electric current is passed through them, are arranged as shown around a non-conducting core and beneath a casing 6, 7 made in two parts. They are threaded through holes in ribs 3 on the core, and may be wound in any suitable manner, being preferably passed through the stem 11. In the case of steering-wheels, as shown in Fig. 3, the wires 19 are led from the hub 16 through the tubular spokes and inside the handles 18.

23,227. Proctor, W. H. W., and **Jackson, F. T.** Oct. 27.

FIG. 2.

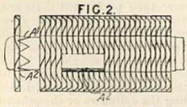
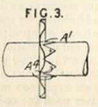


FIG. 3.



Heating buildings &c.—Relates to radiator and similar piping. Means are provided to enable radiating fins to be readily secured to the piping without the use of solder, thus allowing the fins to be made of aluminium. The fins or discs are formed with tongues A^1 raised from their centre. These tongues are tapered in thickness, so that the tips of the tongues of one disc can be forced under the roots of those in the next. A shoulder A^2 may be formed on each of the discs against which the face of the next disc is pressed. In a modification, the tongues are formed with swells or bosses A^4 at their ends, so that the discs may be more securely held.

23,412. Stephens, R. E., and **Jackson, A.** Oct. 29.

Apparatus for automatically regulating temperature.—Relates to apparatus for automatically controlling an electric motor driving an air-compressor or fan, in such a manner as to stop the motor when the temperature of the compressed air reaches a certain limit, and to start it again when it leaves that limit. The air-compressing apparatus may be employed for circulating or replacing air in the hold of a ship or for other purposes. The motor c, Fig. 1, is placed in circuit with a mercury switch e operated by an electro-magnet g placed in a shunt circuit which is opened and closed by a contact-arm m operated by a pressure-gauge tube l or by a thermostatic arrangement. The apparatus is enclosed in a casing a, and a roller n on the arm m makes contact with an adjustable segment o, Fig. 3, carried by the cover of the case. The circuit is completed through spring contacts k^1, k on the cover and case respectively, and through a lamp or other indicator h. When the pressure reaches a limit depending upon the adjustment of the contact o, the roller n leaves the contact o and thus breaks the circuit through the electromagnet g. A spring v then opens the motor switch e. The armature s of the electromagnet is connected to the movable contact u of the switch by an insulating-rod t and a lever t^1. The mercury cup is covered in by a conical insulating-cover w, which prevents accidental spilling.

FIG. 3.

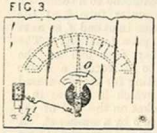
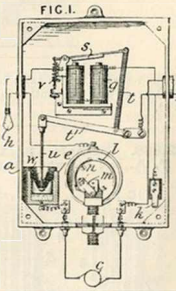


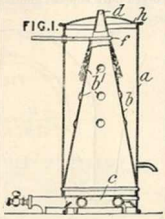
FIG. 1.



23,452. Hussey, J., and **Hussey, J. E.** Oct. 29.

Heating water.—A geyser, shown in sectional elevation, consists of a cylindrical or other shaped outer casing *a*, having a conical interior casing *b* over which water trickles from the feed pipe *f*. The casing *b* is formed with bosses b^1 to delay the descent of the water. A gas or oil burner *c* is provided within the removable base. The interior casing is formed with the gas outlet *d* which projects through the removable cover *h*.

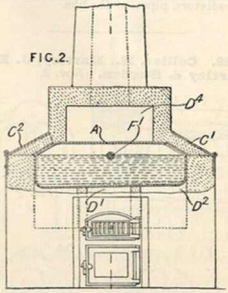
FIG.1.



23,457. Alexander, J. S. L., and **Shiels, A.** Oct. 29.

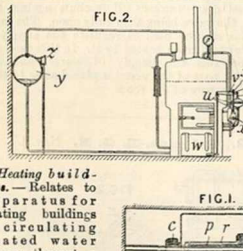
Thermostats.—The temperature of a molten metal bath, used for annealing purposes, is regulated by a thermostatic device of suitable construction such as an expanding rod F^1, which, by means of links and levers, controls a damper or the supply of liquid fuel.

FIG.2.



23,759. Bradley, I. Nov. 2.

FIG.2.



Heating buildings.—Relates to apparatus for heating buildings by circulating heated water vapour through a system of pipes or radiators open to the atmosphere, in which the supply of vapour is automatically controlled in accordance with the consumption, and flooding of the radiators is prevented by the provision of a vessel connected to the top and bottom of the boiler. Fig. 1 shows the general arrangement, in which vapour from a boiler *a* passes through a pipe *b*, open to the atmosphere through a branch pipe b^1, to heating-pipes *p*, or radiators *c*, by branch pipes *e* which are fitted with valves *f*. A valve *f*, shown on an enlarged scale in Fig. 4, consists of a casing, having two cases *h*, *i*, and an open plug *j* which has a port *k*. To ensure that the plug shall fit the casing tightly, it is divided at *l*, and a spring *m* is arranged to press it into contact with the casing. The plug is operated by a handle provided with a pointer, which indicates the exact position of the port *k*. The air and waste vapour from the radiators, or pipes, return by the pipes *r*, either to the boiler chimney by the pipe *s*, or to the ashpit, either directly, or indirectly through a radiating-coil c^1. The automatic regulator consists of a device for admitting feedwater and closing the ashpit and check draught doors or dampers when the density of the vapour in the boiler increases. A flexible diaphragm, held in a chamber *t*, the lower part of which communicates with the boiler by pipes *u*, is provided on its upper side, which is open to the atmosphere, with a pin t^1 which engages a lever t^2 on a shaft *v*, the ends of which carry levers in connection with the ashpit door *w* and a damper in the chimney flue. A valve x^1 in the water-supply pipe is operated by a lever x^2 on

FIG.1.

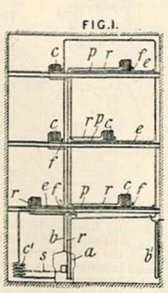
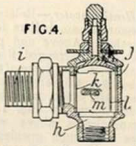
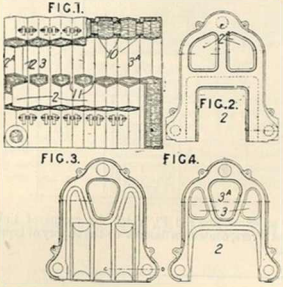


FIG.4.



the shaft *v*. A vessel *y*, provided with an overflow pipe *z*, receives from the boiler any surplus water due to sudden gushes of water of condensation from radiators, pipes, or the like.

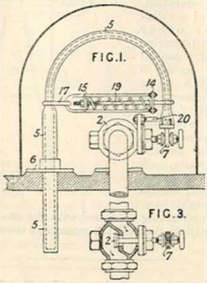
23,788. Collier, H., Hartley, J. E., and **Hartley & Sugden.** Nov. 3.



Heating water.—Relates to hot-water and low-pressure steam boilers formed of sections bolted together. Above and parallel to a longitudinal firebox are arranged flues which form a second dome above the dome of the firebox. Figs. 2, 4, and 3 show front, intermediate, and back sections, respectively, which, when bolted together, form the boiler shown in Fig. 1. The arched firebox 2 communicates above with lateral longitudinal flues 3 through openings 11 between the water spaces. The flues 3 communicate with openings 2 in the front section, and with the central longitudinal flue 3A which leads to the chimney, by passages 12 at the front. Any number of intermediate sections may be employed. Where the boiler is of large capacity, cross water tubes may be fitted in the flues or firebox. The water spaces of the sections are connected by means of short double-conical tubes 10.

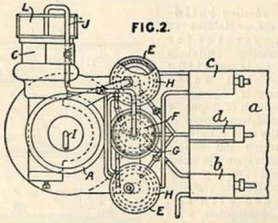
23,900. Paul, A. W., and **Paul, H. A. L.,** [executors of *Paul, E.*]. Nov. 4.

Thermostats.—The apparatus is more particularly applicable in connection with hot-water circulation apparatus for heating buildings, in which the water is heated by steam. The cylindrical metal bulb of a vessel 5 passes through the detachable cover of the "calorifier" or radiator, to which it is firmly attached by the flange 6. The upper part of the vessel is flattened into an oval form, except at the end, which is round in section and fitted with a screw plug continued in a forked end-piece 7 fitting over the spindle of the steam valve 2. Over the free end of the tube passes a screwed stalk 19 on which are a nut and a plate 15. From the top of the cylindrical part of the vessel, a link 17 and a forked piece support another plate 14, and between



the two plates a spiral spring tends to draw the free end of the vessel nearer to the cylindrical part. A stop 20 is provided on the valve casing. When the temperature rises, the expansion of the liquid forces the free end of the vessel outwards, and the valve is shut. When it falls, the end of the vessel draws inwards till it abuts against the stop 20, the valve being then fully open. The same apparatus may be used to regulate the supply of hot water to a room heated by it. In this case, the valve controls the supply of water, and the cylindrical part of the vessel is placed so as to take the temperature of the room.

23,952. Salenius, E. G. N. Nov. 4.

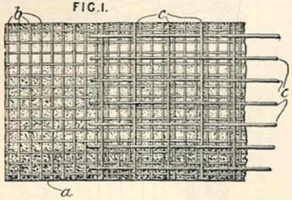


Heating liquids.—In the refrigerating, pasteurizing, separating, and churning apparatus shown in Fig. 2, the milk or cream is pasteurized by being passed into one of a series of cylinders E, which is heated by compressing air or gas in vessels or tubes H

within it by means of a compression cylinder *c* and compressor *a*. The liquid is finally forced into a refrigerating-cylinder F by means of a pump *d*, and the air or gas is allowed to expand into the spiral tube G within that cylinder.

23,995. Crabtree, J. Nov. 5.

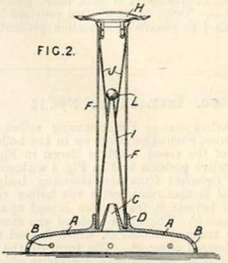
FIG.1.



Non conducting coverings.— Boilers, cylinders, steam pipes, and the like are covered with silicate cotton, asbestos, and silk, or either of the former in combination with the latter, enclosed in a network or reticulated fabric *b* manufactured from asbestos yarn. An additional layer *c* of the reticulated fabric, rendered non-combustible by being boiled in a solution of alum, may be interposed between the covering and the object covered. The material of which the primary covering *a* is composed may be compressed, felted, or woven into lengths of a solid substance.

24,058. Scroxton, A. H., and **Cannon, W. H.** Nov. 5.

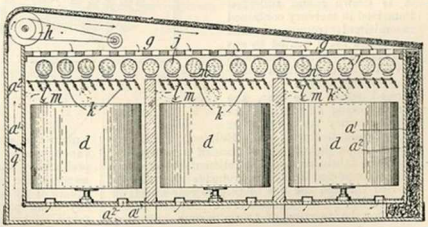
FIG.2.



Boiling-pans.—Relates to an appliance to be placed or fixed in boilers, coppers, and other receptacles in which a liquid is heated to ensure a rapid circulation of the liquid. The invention is especially applicable to coppers in which textile fabrics, such as wearing-apparel, are boiled with a cleansing-agent. It consists of a hollow base A provided with openings B, through which the washing-liquid enters, and having on its upper side a conical exit C for the liquid. The base A is provided with an upright collar D, in which is fitted a tube F having fixed conical linings I, J so as to form a closed air chamber. The heating of the air chamber and the conical shape of the orifices together facilitate the upward circulation of the liquid, which is ultimately deflected downwards in a thin ring-shaped stream by a piece H. The orifice of the cone I may be fitted with a ball L to prevent the liquid from flowing back into the cone.

24,496. Temple, G. T., and **McRae, J.** Nov. 11.

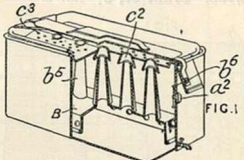
Heating-apparatus. — Storage chambers in which articles are to be heated or cooled are provided with louvres arranged in series at the tops and may also have ports or apertures in the bottoms, so that the amount of hot or cold air introduced may be regulated, external temperature indicators being provided so that any desired temperature may be maintained. The Figure shows a chamber with double walls a^1, a^2, divided into boxes or cubicles each provided with louvres, temperature indicators, ports, and with rotary or other goods-carrying vessels *d*. The roof of the chamber is preferably inclined and has a covering of insulating-material. In its upper part is a fan *h* which circulates the air, and under a grating *g* in the upper part are drums *j* containing a heating or cooling medium ; or coils, pipes, or other arrangements may be used. The louvres *k* over

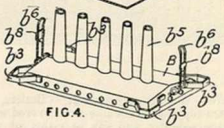


each box are connected together and operated from outside by levers *l*, which are held in place by means of quadrants *m* with notch pins or other catches. Trays or pans *n* are provided below the drums *j* to receive condensation products falling from the drums. The double walls are partly filled with slagwool or other insulator, and serve also for air circulation, which is further regulated by the baffle *q*.

24,590. McLeod, A. Nov. 12.

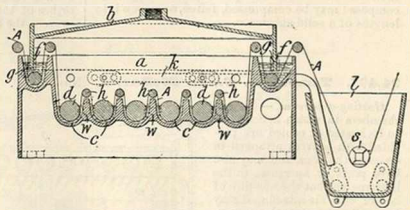
Boiling-pans. — For cleansing soiled linen, a vigorous circulation is set up in the boiler by the use of the vessel which is shown in Fig. 1 in its operative position and in Fig. 4 without its cover and detached from the cleansing boiler. The vessel is constructed with the hollow perforated false bottom B, from which extend upwardly the funnels b^5. The upper ends of the funnels open into trumpet-mouths c^2, which depend from the perforated cover c^3. The form of the vessel is adapted to the shape of the boiler which, in this case, is shown as rectangular. Suitable handles are provided. For securing the vessel in place, corner brackets b^3 are employed, and also the wire-loops b^6, the lower ends of which are bent into spirals. Cross-pieces b^8 have their lower ends curved downwardly and inwardly, while their upper ends are preferably flat. By these means, when the vessel is placed in position, the cross-pieces slide over the stops a^2 on the boiler and are secured below them until released by springing the loops inwards.





24,617. Mather, Sir W., and **Hepburn, G. G.** Nov. 12.

Heating-apparatus. — Heated mercury is employed to heat fabrics and similar materials in bleaching and other processes, for instance when it is desired to act with great heat on chemicals in fabrics. The fabric A is drawn round rollers *d* immersed in mercury contained in semicircular troughs *c*, formed in a closed vat *a* heated by gas jets below. The removable cover *b* is formed with a flange *g* extending into a channel *f* formed round the vat, the channel being filled with mercury, mercury and water, or other liquid to form a seal. Rollers *h*, which may be above or below the surface of the mercury, carry the fabric between the rollers *d*, these rollers being supported in bearings inside the vat, or carried through the vat to receive gear-wheels on the outside. Packed glands *w* are provided in the tank for the insertion of thermometers. Mercury vapour and, when moist fabrics are treated, water vapour escape along a pipe *k* to a condensing or preliminary washing tank *l* for the recovery of the mercury, the fabric being also led round a revolving square or polygonal roller *s* in the tank, by which any small particles of mercury adhering to the fabric are beaten out.



24,722. Thorbrogger, H. Nov. 13.

Heating water.—A boiler for heating water consists of a number of cast-metal pieces or cells containing water channels, and of such form that they can be arranged one beside the other, and thus form the fuel space, grate, combustion chamber, and air, smoke, and water channels. The water channels *a*, Figs. 1 and 2, are connected to the pipes *b*, Fig. 1, and are provided with ribs which form the air channels *d*, draught channels *c*, and also the firegrates *e*, *f*. The boiler is divided into two parts, of which the part *g* forms the fuel chamber, and *h* the combustion chamber. Fuel is fed to the chamber *g* through the door *i*, Fig. 2, from which it passes down to the firebox *k*. Air for combustion enters the bottom grate *f*, and side grate *e*, as shown by the arrows, and also passes along the side channels and central channels *d* to the fire. The gaseous products from the fuel in the chamber *g* mix with the air entering the side grate *e*, and raise the temperature of the furnace. The hot gases pass through the combustion chamber *h* and channel *c* to the chimney, and give up heat to the water in the channels *a*.

FIG.1.

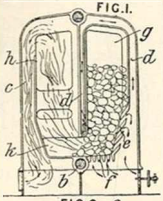
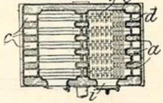
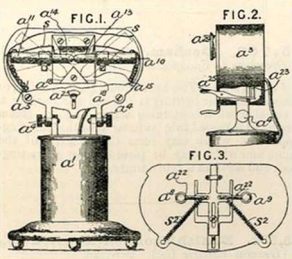


FIG.2. *f e*



24,912. Ayer, J. I. Nov. 16.

FIG.1. FIG.2.



Heating by electricity.—Relates to means for producing intense heat, *i.e.*, of the electric arc, for a short time, applicable for the purpose of a cigar lighter &c., as shown in Figs. 1, 2, and 3. Within a casing a^3 is a pair of tubes a^{10}, a^{11} provided with carbon electrodes a^{13}, a^{14} adapted to turn with shafts

FIG.10.

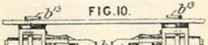
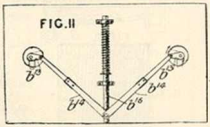


FIG.8.

FIG.11.

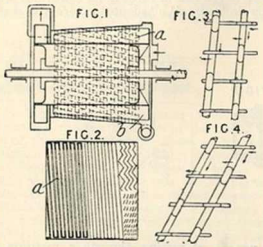


or studs a^5, a^9 passing through a partition a^5 Arms a^{22} are fixed on the studs, and springs s^2 tend to turn them so that the carbons normally rest on a wedge-shaped insulating-block a^{15}, as shown in dotted lines. To strike an arc, a lever a^{25} is depressed and a slide a^{23} raised, so turning the arms a^{22} and the tubes and electrodes into the horizontal position, when springs *s* engage and hold the carbons and at the same time make electric connection. A further movement lifts the carbons above the horizontal position, slightly separating them and so forming the arc. On releasing the lever a^{25}, the springs s^2 restore the carbons to the first or 'off' position. A fireclay or like block a^{12} is fixed on the partition partly to enclose the arc. The casing is fitted with an opening a^8 for inserting the cigar, and may be pivoted at a^4 to the standard a^1 so that it can be tilted. The opening a^{29} may be provided with a pivoted shield or shields a^{31}, a^{32}, Fig. 8, to protect the user. In a modified construction, Figs. 10 and 11, the carbons *b* are mounted in carrier tubes, which are reciprocated horizontally by a pin-and-slot device operated from the sliding rod b^{16} through levers b^{14} and cranks b^{13}. Springs are provided for holding and making contact with the carbons.

25,374. Michell, H. C., and **Michell, D. S.** Nov. 20.

Non-conducting compositions for steam pipes, boilers, &c. The composition contains flaked mica, a binding-agent, such as clay, which is normally dry and is capable of forming a paste with water, and a fibrous material, such as asbestos fibre. The clay, in a powdered state, may be sprinkled universally over the mica and asbestos, which have been previously mixed together and moistened with water; or the mixed mica and asbestos may be arranged in layers with the powdered clay between. The mica may be obtained by the flaking process described in Specification No. 4969, A.D. 1901, [*Abridgment Class* Grinding, crushing, &c.]. Ordinary London blue clay is mentioned.

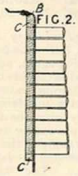
25,458. Theisen, E. Nov. 21.



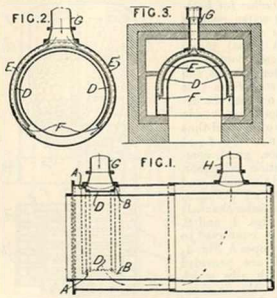
Heating gases; heating liquids.—In apparatus for evaporating, cooling, heating, &c., in which currents of gas and of liquid are admitted into a casing, the liquid is guided in a spiral course in one direction along the casing by means of channels *a* of various forms, such as are shown in Fig. 2. The ridges forming the channels may be oblong, triangular, arcuate, or otherwise shaped in section. In order to regulate the flow of the liquid through the casing, network fabrics with adjustable strands may form the channels, as shown in Figs. 3 and 4, whereby the liquid is not only guided, but is broken up in its passage over the cross-wires. The liquid is caused to adhere to the casing by the pressure of the gas, which is given a rotary motion by blades *b* on a rotating body. According to the Provisional Specification, the flow of the liquid may be regulated by using interchangeable detachable channelled linings of different pitches in the casing.

25,500. Wilby, R., and **Wilby, D.** Nov. 23.

Heating water.—To prevent the exposed parts of boilers from burning and to prevent leakage and the contact of cold air, an asbestos paste is applied. In Fig. 2, the paste C is shown upon the boiler tube-plate B. The asbestos is powdered and mixed with water, or with other suitable liquid, to form a stiff paste.



25,690. Kitchen, J., Balmforth, T., and **Brown, H. C.** Nov. 24.



Heating water.—In a boiler for supplying hot water to heating-apparatus, the return connection is mounted upon the top, instead of at the bottom as hitherto, the objects being to facilitate the examination of the pipe joints for repairs, to provide a larger heating-surface, and a better circulation of the water in the boiler. The improvements, as applied to a "Cornish Trentham" boiler, are shown in Figs. 1 and 2, and to a saddle boiler in Fig. 3. The return connection G communicates with an annular space E, which is formed by riveting angle or Z irons A, B to the boiler shell, and attaching a plate D to the flanges of them. The outlets F of the annular space E are near the bottom of the boiler, so that the water flows upwards to the outlet pipe H as shown by the arrows.

25,769. Denham, A. M. Nov. 25. *Drawings to Specification.*

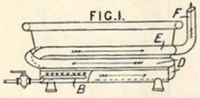
Footwarmers.—The heat from a gas, oil, spirit, or electric lamp for lighting is utilized for heating a vessel above it containing water, and the steam produced is passed into tubular or other heating-apparatus, which may form the pedestal of the lamp, and which may be placed below a writing-desk and serve as a footwarmer.

25,853. British Thomson-Houston Co., [*General Electric Co.*]. Nov. 26.

Non-conducting compositions suitable for protecting electric apparatus from heat and for making

fireproof parts of such apparatus. Soapstone, clay, or other refractory adulterant and cryolite are finely ground, mixed together in a moist condition, and pressed into moulds. The formed articles are removed, dried, and fired at a temperature between 900° C. and 1100° C., preferably 950° C., which is high enough to fuse the cryolite slightly and thereby bind the mass together, but not high enough to change or harden the soapstone. Cryolite is the preferable flux, but others, such as sodium carbonate, or fluor spar, may be used, providing their melting points are low enough. The proportions of the ingredients may also be varied. The product is stated to drill or machine readily.

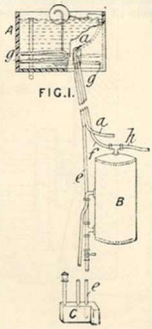
26,161. Schwarz, G. Nov. 30.



Heating water in baths. Flue pipes D, E, of which one side is formed by the bath, lead from a chamber containing a gas burner B or other heater. They pass underneath the bath and crosswise round it, terminating in a chimney flue F.

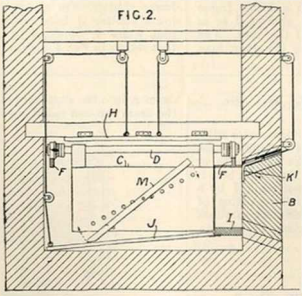
26,210. Burdon, W. M. Dec. 1.

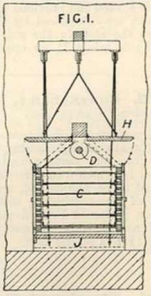
Heating water.—A hot-water supply system is provided with means for heating the water in the supply cistern, thereby preventing the failure of the supply due to frost. The water enters the cistern A by the supply pipe *a* and passes to the stove boiler C by the pipe *e*, which has two branches inside the cistern and is in communication with the circulating-tank B. A pipe *f* leads from the top of the tank B to a coil pipe *g* in the supply cistern. The other end of the coil *g* is in connection with the pipe *e*, leading to the boiler. The pipe *h* is the supply pipe to the house. The hot water from the boiler C passes to the tank B and then round the coil pipe *g*, thus heating the cold water in the supply cistern A. The supply pipe *a*, being also entirely in the cistern, is prevented from being frozen up.



26,330. Gore, H. R., and **Frazer, W. S. W.** Dec. 2.

Heating-apparatus.—In apparatus for use in cooling, heating, or otherwise treating goods in a closed chamber, means are provided for minimizing the escape or entrance of heat, vapour, or the like during the insertion or withdrawal of the goods. The goods are contained in cars or carriers, which are attached to endless chains or between wheels so as to circulate within the chamber in an endless series. When the door of the chamber is opened, shutters cut off connection between the interior of the car and the chamber. Figs. 1 and 2 show one form of apparatus in which a car C fitted with trays is arrested opposite a door B in the side wall of the chamber. The cars, which are open at the top, bottom, and front, are attached to





cross-bars D, which connect a pair of endless chains and rest on rails F. To a cross-bar, situated centrally above the doorway, is hinged a pair of shutters H, which are connected to the door B so as to descend and engage with the sides of the car when the door opens. Another shutter J, hinged below the door, is connected to the shutters H by a cord passing over guide-

FIG. 4.

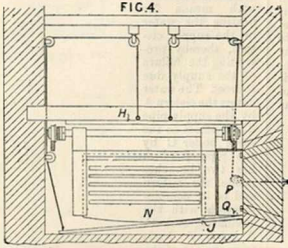
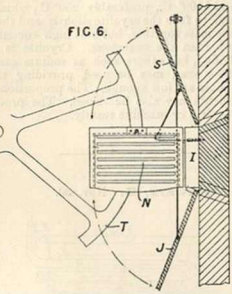


FIG. 6.



pulleys so as to rise and close the bottom of the car when the shutters H fall. The sides of the car have perforations, which are masked by a pivoted lever M when the shutter J is raised. The lever M is so weighted that, when the shutter J is lowered, the lever uncovers the perforations. The shutters H may be connected by cords passing over guide-pulleys to a bolt K^1, so as to be held in the raised position when the door is shut. On opening the door, the bolt is released and the shutters H fall. The doorway may also be surrounded by fixed or hinged wings I. In the modification shown in Fig. 4, the sides of the cars are slotted and provided with a slotted frame N, which may be raised by the shutter J so as to close the slots in the side of the cars. The hinged side wings P, on opening the door, may be forced against the sides of the car either by cam-shaped wedges Q on the lower shutter J, or by cords connected to the shutters H, which are here shown connected directly to the door. Fig. 6 shows another form of apparatus in which cars held between the two wheels T are charged through a door in the end wall of the outer casing. Two hinged shutters S, J, one above and the other below the door, are connected together and to the door, so that, on opening the door, the shutters close the top and bottom of the cars. The slotted sides of the car are closed, as before, by a frame N actuated by the lower shutter. On closing the door, the heavier lower shutter J falls raising the upper shutter. Side wings I, actuated in a manner similar to that shown in Fig. 4, may be provided also.

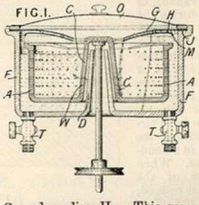
26,363. Cunynghame, H. H. Dec. 2.
Drawings to Specification.

Non-conducting compositions.—Furnaces or kilns used for enamelling, melting, or baking metals, glass, porcelain, pottery, and like substances or articles, in which a considerable degree of heat is required to be maintained, are surrounded by a jacket of non-conducting material, consisting of asbestos, plaster-of-Paris, flour, and weak solutions of silicate of soda or water glass, or of glue, kneaded into a plastic mass.

26,471. Strehlenert, R. W. Dec. 3.

Digesters.—In a centrifugal apparatus for treating solid substances with solvents or other liquids, the liquid flowing from the perforated rotating drum A into the stationary casing F is returned to the drum through radial pipes or the space between

FIG. 1.

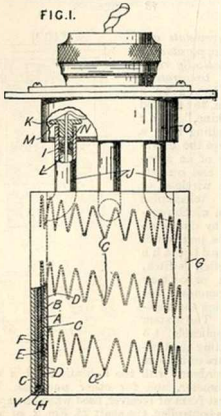


a cover G and a disc H. This space may be separated into channels by vertical partitions. The

cover G may rest on an india-rubber or like ring J, and the disc H may have a down-turned flange M. Perforations W are formed in the inner conical wall C of the drum to prevent liquid from overflowing the central conical part D of the casing. The casing may have a cover O, and may be formed with double walls to form a steam or hot-water jacket. The liquid is discharged through cocks T.

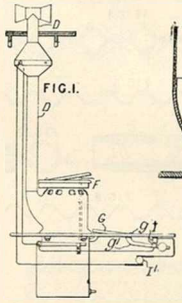
26,533. Krause, W. Dec. 4.

FIG. 1.

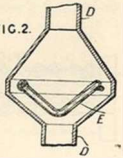


Heating liquids.—In an electric heater, the heating-wire is entirely enclosed by metallic surfaces, being insulated therefrom by mica and a cement of special character. Fig. 1 shows a tubular form of heater, in which the wire C is embedded in a thin layer of cement D and insulated from the concentric tubes A, G and the other layers of wire by sheets of mica B, E, F. The annular spaces at the ends of the tubes A, G are filled in with a vitreous powder V and a ring H. The tubular body is supported from the chamber O by tubes J, two of which serve to carry the leads K, these being insulated by beads L alternating with layers of fine powder I, such as magnesium oxide. A concave piece of asbestos paper N, pressed down by screwing the plug M, serves to make the tube J airtight. The tubular part of the instrument is now heated strongly, thus causing the mica to swell and press the cement and wire towards the centre, the air being expelled by expansion of the mica. While at the high temperature, the ends H are brazed on. The cement on cooling is of a cellular nature so as to yield to the expansion of the wire. The invention is also described as applied to heaters of other shapes. The cement preferably contains the following ingredients :—green glass, felspar, borax, and kaolin, with or without sodium silicate.

26,792. Wilson, J. H. Dec. 7.



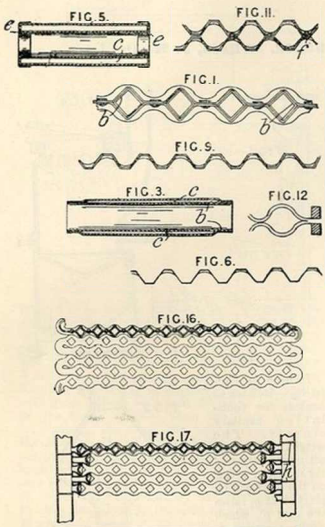
Heating by electricity.—Relates to heaters for ventilating sanitary closets. The weight of the user acting directly and through the rod F on the platform G, pivoted at *g*, raises the part g^1, which closes a switch I, thus supplying electric current to the burner J, Fig. 4, and a heater E, Fig. 2, at the top of the ventilating-shaft D. In the case of an electric car, the current may be derived from the trolley-line. The heater E, Fig. 2, is made in the shape shown, so that the current of air caused by the heat may readily pass out.



26,795. Bennett, F. E. Dec. 7.

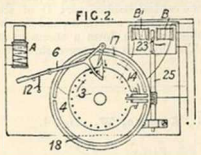
Heating liquids and gases; heating buildings.—Relates to surface apparatus for heating, evaporating, cooling, condensing, and similar purposes, especially applicable to radiators for motor cars, water-heaters, calorifiers, refrigerators, and the like. In one form of apparatus, Figs. 1 and 3, metal plates or strips having transverse corrugations are placed together in pairs so that the convexities may come in contact. In the channels formed by the opposite concavities of the plates

are inserted tubes *b*. The plates are curved outwards or rabbeted, so as to leave a space *c* between the tubes and the surrounding plates for the passage of fluids. In a modification, the tubes

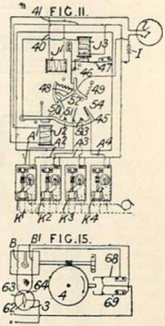


taper towards the centre of their length. Fig. 5 shows in section another form of apparatus in which two plain corrugated plates are held together by caps *e* so as to form a channel *c*. Figs. 16 and 17 show two forms of a complete radiator consisting of elements so arranged as to form a continuous passage for the liquids. In Fig. 17, the elements pass into end boxes provided with baffles *h*, which cause the fluid to pass successively through the elements. In another method of building up a radiator, two corrugated plates, shown in elevation in Fig. 6, having the corrugations towards the same side curved outwards, and those towards the opposite direction plain, are secured together, so that the plain corrugations on one plate come against the curved corrugations on the other, as shown in Fig. 9. Two such pairs of plates are then secured together by clips *f* to form the radiator shown in Fig. 11. Fig. 12 shows a method of carrying the end of an element into an end box. Several such pairs of plates may be joined up in like manner.

27,073. Torres, L. Dec. 10, A.D. 1902, [*date applied for under Patents Act, A.D. 1901*].



Thermostats and other apparatus for automatically regulating temperature. —Relates to a system, to be called "telekine," for controlling from a distance the movements of an apparatus, and consists of a wireless or other telegraphic system which regulates, by determining the position of a needle, the controller, switch, motor, or other "servomotor" for actuating the apparatus. The system is applicable to regulating the temperature of a room

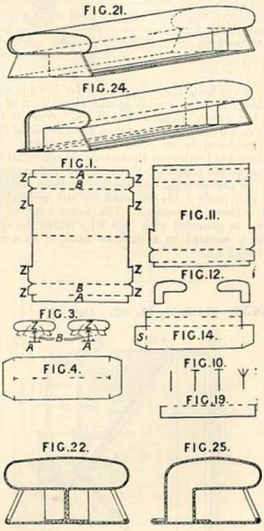


in accordance with the indications of a metallic thermometer, and for other purposes. In the simplest form of receiver, used when one apparatus only is controlled, the shaft 25, Fig. 2, of a motor controlled by a commutator switch 23 is geared to a disc 4, which rotates loosely on the shaft of a peg-wheel 3 and is fitted with two conducting-arcs 17, 18, upon which a spring-pressed hinged brush 14 on the wheel 3 bears. As soon as the wheel 3 is moved to carry the brush 14 off the insulating-section between the arcs 17, 18, connection is made from the motor mains through one of the arcs 17, 18 and one or two electromagnets B, B¹, so that the switch 23 is pulled over and the motor connected up to drive the disc 4 after the wheel 3, until the disc and wheel are in their original relative positions. When the wheel 3 need only be driven in one direction, an escapement lever 6, actuated by a spring 12 and current impulses passed through a solenoid A, may act as the driver, the continuous rotation of the disc 4 being transmitted as oscillary motion to a shaft &c. by a short crank and long connecting-rod. When rotation in both directions is required, the brush 14 may be set on a pivoted armature which works in front of a number of solenoids set around the disc 4; a dynamo is connected to these solenoids in

succession by moving the arm of a transmitter or switch over a circular series of contacts, so that the brush 14 moves, following the movement of the switch. The number of solenoids may be reduced by one on the Vernier principle by providing any desired number of projecting armatures on the wheel 3, and one less than an equal number of solenoids. Fig. 11 illustrates a case in which a number of receivers K^1, K^2, K^3, K^4 are controlled from one interrupter *i*, actuated, if desired, by a wireless system. The first operation of the interrupter *i* closes circuits from a battery I through two solenoids J^2, J^1, the armatures 45, 46 being drawn back to allow the lever 48 to move under the action of a weak spring 49 or of a clockwork mechanism. The slow movement of the lever 48, due to its large mass or clockwork driving-mechanism, brings the tooth 50 over any of the teeth 51, 52, 53, 54 by the time the interrupter *i* is opened and the lever 45 rises. As the armature 46 is held by the armature 47 after the interrupter *i* is opened, the tooth 50 is carried round into contact with one of the teeth 51, 52, &c. determined by the duration of the current, and then completes the battery circuit through the solenoid A^1, A^2, &c. of the corresponding receiver K^1, K^2, &c. and also through the solenoid J^3. The proper disc 4 is thus rotated through one step, and the transmitting-apparatus returned to its original position; during its return, the tooth 50 rubs over the insulating-faces of the teeth 54, 53, &c. In some cases, it is desirable that the "servomotors" should be controlled by the needle of a compass &c. so that, for example, a ship or balloon can be kept in a fixed course. For this purpose, the compass needle 62, Fig. 15, is supported by a bracket on the shaft of an escapement or peg wheel 3 with one end between two contact-stops 63, 64 on the bracket. The stops are connected to the solenoids B, B^1 of the motor switch 23, and the needle to the return wire of a battery, so that the motor is driven to drive the disc 4 and the rudder in the proper direction when the needle, by deviation of the ship &c. from its course, touches one of the stops. The battery circuit is broken at one of two interrupters 68, 69, when the disc 4 and rudder reach the limit of their travel. The position of the wheel 3, bracket, and stops 63, 64 is controlled as already described, so that any desired course &c. may be set. This arrangement is applicable, among other purposes, for regulating temperature by the indications of a thermometer.

27,308. Stewart, A. D. Dec. 14.

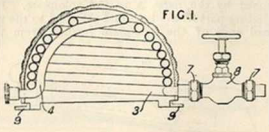
Footwarmers.—A footwarmer for railway carriages, motor cars, and other vehicles is raised above the floor so that heat is transmitted through the uppers of boots &c. Figs. 21, 22 and 24, 25 show two forms of footwarmers. The other Figures show the parts of which the footwarmers are built up. In the apparatus shown in Figs. 21 and 22, a liquid container of the usual form rests upon the upturned ends of a sole-plate. The metal plate shown in Fig. 1 is bent to form the chamber shown in end views in Fig. 3. The parts B of the plate are riveted together to form a central water-tight supporting-stay, which is attached by the parts A to the sole-plate. The projecting parts Z are bent and attached to the upturned ends of the sole-plate formed from the



metal shown in Fig. 4. An additional central stiffening-stay, which may be one of the forms shown in end view in Fig. 10, may be fixed between the parts B. This stay extends from the sole-plate to the upper part of the liquid container. To obtain the apparatus shown in Figs. 24 and 25, the plate shown in Fig. 11 is bent to fit the end-pieces shown in Fig. 12. The plate and end-pieces, when united, are secured to the sole-plate formed from the metal plate shown in Fig. 14. The ends *s* of the sole-plate are turned up and attached to the liquid container, as shown in Fig. 24. Fig. 19 shows a sole-plate for supporting existing footwarmers. The plate has its upturned ends provided with inner flanges to which the footwarmers may be attached. Existing footwarmers may be supported by, and attached to, other supports, such as end legs in the form of the letter H.

27,385. Sivewright, G. W. Dec. 14.

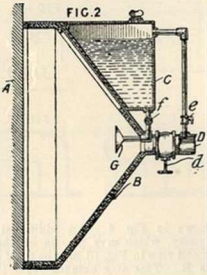
FIG.1.



Heating buildings.—Apparatus for heating ships' cabins and other rooms by the circulation of hot air, hot water, steam, or other fluid, consists of a pipe coiled into a compact conical or conoidal form and enclosed in an outer radiating casing. The heating-fluid enters at the outermost convolution 3, passes to the crown of the coil, and thence passes out by the internal portion 4. Screwed unions 7 and stop cocks 8 are attached to the ends of the coil, without the casing. The lower edge of the casing is provided with lugs 9 by which the apparatus is secured to a deck or floor, or to a wall, bulkhead, &c.

27,426. Caffall, E. M. Dec. 15.

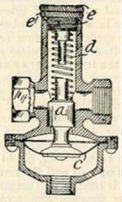
FIG.2



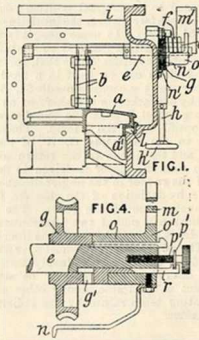
Heating-apparatus; heating air.—For waterproofing and preserving surfaces of brick, stone, plaster, metal, wood, and other materials, the surface is heated by compressed air, sprayed with the treating-material, and then again treated with heated compressed air. Heated air under pressure is introduced through a pipe D to an oven B, which has an open face placed against the surface A. When the surface is sufficiently heated, the valve *d* is closed and valves *e*, *f* opened. The compressed air then forces material in a tank C through a spraying-nozzle G upon the surface, and this is continued until it is saturated, when the valve *f* is closed and the hot air turned on again through the valve *d*. For heating the air, it may be passed through a spiral pipe within a stove, or it may be passed up through coals placed on a grate in an enclosure.

27,489. Bond, E. Dec. 15.

Heating water. — The gas supply of apparatus for heating water in restaurants &c. is controlled by a spring-loaded valve *a*, preferably of the cylindrical-plug type, which is operated automatically by the pressure of steam within the apparatus acting on the underside of a flexible diaphragm *c*. Provision is made to allow a small quantity of gas to pass to the burner when the valve *a* is closed. A piston may be employed in place of the diaphragm.



27,715. Anderson, A. Dec. 17.



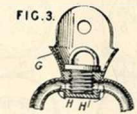
Heating buildings &c.—Relates to automatic relief valves for steam-heated radiators and the like. The valve is normally kept closed by the action of a spring the tension of which is adjustable, and the valve is provided with a dash-pot device to prevent shocks. A valve *a*, shown partly in section in Fig. 1, is normally kept on its seat by a link *b* attached to a lever-arm on a spindle *e*, around which is coiled a spring *f* secured at one end to a flange *o* of a sleeve o^1 keyed to the spindle, and at

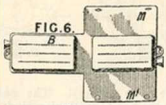
FIG.5.

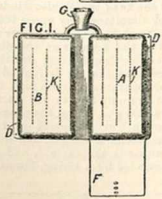
the other end to a worm-wheel g loosely mounted on the spindle e. The pressure of the valve on its seat can be altered by turning the worm-wheel g by means of a worm attached to a shaft h turned by a handle h^1. When the pressure on the inlet side of the valve becomes appreciable, the valve opens and the steam escapes through an outlet pipe i. The valve seat is provided with an annular space l which, when the valve closes, becomes sealed by a lip a^1 of the valve and acts as a cushion preventing shocks; the lip a^1 also acts as a guide for the valve. In a modification, Fig. 5, the chamber l communicates with the outlet side of the valve during the commencement of the closing of the valve. In the modification shown in Fig. 4, the wheel g, instead of being actuated by a worm-wheel, is provided with a number of slots g^1, into any one of which may be slid a feather r actuated by a collar p^1 on a screw p screwing into the spindle e; the wheel g can thus be keyed to the boss o in any desired position, and so the tension of the spring can be adjusted. The spring f may be dispensed with, and the valve may be opened and closed by means of the wheel h^1. The amount of opening of the valve is indicated by a pointer n moving over a scale n^1, the pointer being attached to a lever on the boss o, an adjustable weight m^1 being attached to the lever.

28,012. Peterson, H. E. Dec. 21.

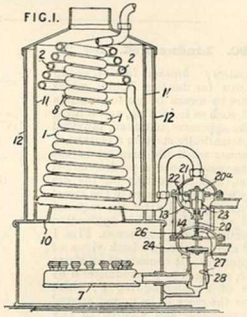
Hot-water bags and the like. — A folding water bag for warming nursing-bottles, keeping warm poultices and the like, cooling or heating liquids, or for use as a muff or surgical bandages, consists of two water pockets, which may each be split up into a number of smaller compartments, united by a flexible water-tight portion, and forming, when folded, a receptacle for the articles to be heated or cooled. In one modification, Fig. 1, one pocket A is folded over the other and secured along the edge D. A flap F, which is secured to the outside of the pocket B, may also be provided. The neck, which is shown adapted for a screw stopper, has two lateral openings H, H^1, which are connected by flexible tubes with each pocket. By compressing one flexible tube, one pocket only may be filled. In the modification shown in Fig. 6, side flaps M, M^1 fold around the pocket, and may be secured to each other or to the outside of the pocket B. When the bag is used as a muff or surgical bandage, the flaps are omitted. Strengthening-stays K, Fig. 1, prevent the pockets from bulging when filled. The apparatus may be formed by superimposing two sheets of flexible waterproof material and securing them where required. If one sheet only is employed, it is folded upon itself, or may have both ends folded over in the same direction against the sheet itself.







28,048. Winterflood, J. F., and **Winterflood, A. C. H.** Dec. 21.



Heating water.—In a rapid water-heater, having automatic valves for controlling the supply of water and gas, the water is heated in two conical coils 1, 2 connected together at the top and bottom and arranged above a gas burner 7. The coils are enclosed in cylindrical casings 11, 12 with a supporting-trough 10 at the bottom, the course of the products of combustion being determined by a plate 8. The passage of water and gas through the valve-chambers 13, 14 is controlled by a ring valve 21 and a disc valve 24, which are both secured to a spindle 20 and are operated by the water pressure on a rubber diaphragm 22 and the pressure of a spring 27 on a similar diaphragm 26. The ring valve 21 slides over a clip 23 and is secured to the spindle by a bridge 20^a. The arm of the burner 7 is pivoted on a plug 28.

28,119. Pyle, J. H. Dec. 22.

Thermostats; steam traps. — The steam supply in calorifiers, water-heaters, steam pans, coils, and the like is automatically regulated so as to keep the liquid heated by such steam at a uniform temperature. An equilibrium valve *a*, enclosed in a casing through which the steam supply passes, is connected by a rod B to a disc or like valve *b*, fitted in the inlet to a trap or other vessel D. The rod B is coupled to a bow or like shaped metal piece E fitted in the vessel D. The exhaust or condensed water enters through a side inlet C^1 in the tube C, which encloses the rod B, and passes out by an outlet F. If the temperature of the exhaust rises too high, the piece E expands, closing the valves *a*, *b*. On cooling, the valves *a*, *b* are again opened, and steam admitted to the coils and the like. The apparatus is applicable to calorifiers for heating buildings, supplying baths, and like purposes, and to double-cased steam-jacketed pans and coils used for bottling liquors.

FIG.1.

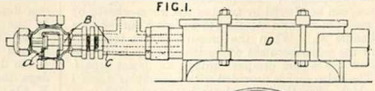
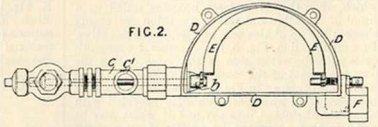


FIG.2.



28,190. Lindner, M. Dec. 22.

Digesters; heating liquids. — In apparatus for heating liquids under pressure by means of gas for a certain period, such as in cooking, vulcanizing, and like apparatus, means are provided for automatically starting a clockwork mechanism when the pressure in the cooking vessel reaches a predetermined amount, and for cutting off the gas supply when the pressure in the vessel rises too high, and after the required period of heating. The application for dentists' use is mentioned. Figs. 1 and 2 show front and back views of the apparatus. It consists of an alarm clock *b*, attached to a manometer *d* by means of a clamping-ring g^1, which enables the clock to be moved around the manometer and secured in any position. The manometer is connected to the cooking-vessel by means of a union d^1, and a pointer *p* registers the pressure upon the scale shown. Behind the manometer is fixed a rotatable gas box x^1, to which is attached a pointer *i*, and gas-supply pipes, one of which, *y*, is connected to the burners and the other to the gas cock *a*. By rotating the gas box x^1 the pointer *i* may be brought to any position on the pressure scale, while at the same time a valve seating x^2 on the pipe *y* is moved away from the valve *x*, which is attached to the axle of the pointer *p*. To start the apparatus, the clock is moved around the manometer until an adjustable pin k^1 on the pivoted lever *k*, to the end of which is attached a spring *f* for engaging the balance wheel of the clock, is opposite the required number on the scale. The pointer *i* is also placed opposite the same numeral. The clock is then wound up by the key *t*, which also winds the alarm mechanism and simultaneously opens the gas cock *a* by means of the chain *s*. The pointer *x* on the clock is then set to the number on the dial indicating the time for which the cooking or other process is to proceed, and the gas is ignited. If the pressure in the apparatus rises too high, the valve *x* closes, and gas can only flow to the burners by means of the bye-pass y^1. When the process has continued long enough for the clock to run down, the alarm mechanism is started, and simultaneously the key *t* unwinds the chain *s*, and the cock *a*, which is controlled by a spring, closes.

FIG.2.

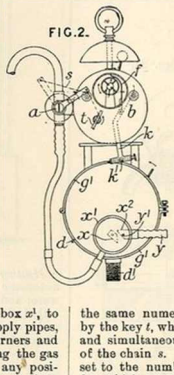
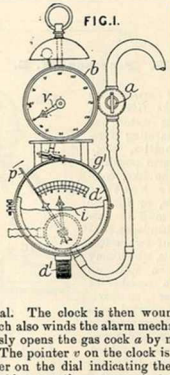


FIG.1.

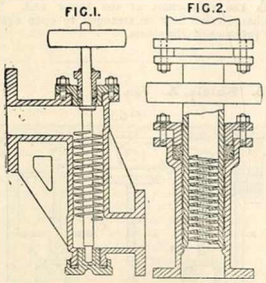


28,804. Murrell, R. Dec. 31. *Drawings to Specification.*

Heating buildings &c.—Greenhouses are constructed on a tubular framework, which may be utilized for heating purposes and provided with draw-off taps.

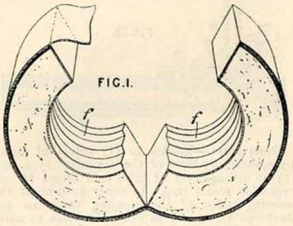
A.D. 1904.

229. Hurn, E. Jan. 5.



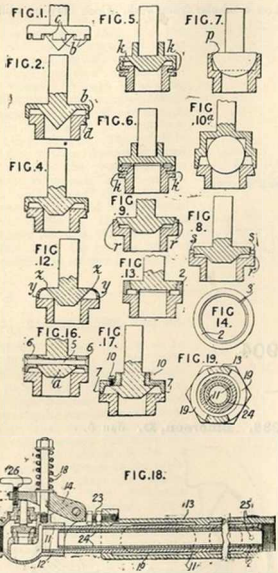
Heating water.—Hot or cold water is circulated through pipes by means of an external or internal screw mounted in one of the pipes. When applied to a hot-water circulation system, the screw, which is provided with a pulley driven by motor, gas engine, or steam power, is mounted in the flow pipe immediately over the boiler or cylinder. Fig. 1 shows an external, and Fig. 2 an internal, screw arranged as described.

236. Emerson, D. Jan. 5.



Non-conducting coverings.—A covering for boilers, steam pipes, and the like consists of slag wool, silicate cotton, or other like material, between which and the pipe or the like, is asbestos paper or cloth, or similar material, corrugated, so as to form air spaces *f*. The covering is preferably enclosed by layers of strawboard, or millboard, asbestos paper, and cotton cloth. The various layers of material are so made that the covering may be swung open, as shown in Fig. 1. The air spaces *f* may be formed by studs of asbestos, fixed to the covering, and resting upon the pipe or the like. The covering is held in position by suitable clips.

286. Ogden, J. E. L. Jan. 5.



Steam traps.—Relates to (1) valves of steam traps, especially those of the expansion type, and (2) an arrangement of tubes and frame for an expansion steam trap. In order to prevent the scouring action of the escaping water on the discharge valve, and to cause the valve to move away rapidly from its seat, the valve is provided with a double beat. The inner main part of the valve being held on its seat by a spring or other means, is steamtight, but the other part of the valve, situated on the discharge side of the main valve, is only in easy contact with its seat. Figs. 1, 2, and 4 show two forms of lift valve, in which the valve is provided with an annular flange *b* enclosing a flange *d* on the valve seat. The flange *d* may be formed with a number of slits *c*, as shown in Fig. 2. Figs. 5 and 6 show other forms of valves, in which the flange on the seat is provided with slits *k* to give the flange elasticity. The flange *d*, shown in Fig. 1, may be similarly provided with slits. Fig. 7 shows a hemispherical valve, having a second seat *p* formed with an annular extension of the main valve seat. The hemisphere may be replaced by a sphere detached from the valve-stem. Fig. 10ª shows a sphere enclosed in a casing having a seat on a flange of the main valve seat. The valve shown in Figs. 8 and 9 has the form of a cylinder with the frustum of a cone on its underside. The cylindrical portion is adapted to slide within an annular extension *r* of the main valve seat. The extension *r* may be provided with slots *s*. In a similar arrangement the main valve seat is flat. Figs. 12, 13, 14, 16 and 17 show means for enabling the outer valve to be seated at the same time as the inner main valve. Fig. 12 shows the main valve attached by a flexible connection *z* to an annular flange *y*. Figs. 13 and 14 show the main valve surrounded by a ring 2 which may be formed with a slit 3. In the arrangement shown in Fig. 16, a ring-piece 6 is connected to the main valve *a* by a pin 5. Fig. 17 shows a ring-piece 7 screwed on to the main valve and held in position by set-screws 10. In the expansion trap shown in Figs. 18 and 19, a tube 11 of a material with a high coefficient of expansion has its inlet end attached to a frame 13, and the other end attached to the discharge valve casing 12. The frame 13, which is provided with openings 19, carries an adjustable set-screw 23 which is adapted to operate, through a lever 14, the spring 18 controlling the discharge valve. Within the tube 11 is arranged an inner tube 24, which conveys water from the trap inlet to the valve end of the expansion tube. This tube 24 has perforations 25 which allow steam, but not water, to flow outwards through them. A screw 26, or a handle, is fitted to the lever 14 to let the trap blow through. The trap may be arranged horizontally or vertically with the valve-chest at the lower end. The discharge-valve may be arranged to open against the pressure of the steam.

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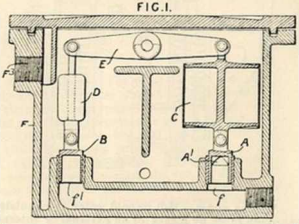
465. Shiels, A. Jan. 7.

FIG.1.



Steam traps.—A steam trap or similar apparatus of the float type is adapted for use with high-pressure steam by balancing the pressure against which the discharge valve opens. The float *c* and a discharge valve A of the piston type are connected to one end of a pivoted lever E, which is connected

at its other end to a counterpoise D and a plunger B sliding in a conduit f^1 open to the main discharge channel. The valve A, which has lateral openings A^1, is pivoted to an extension at the foot of the float. The float consists of a casing provided with circular end-pieces and a central stem or web. The counterpoise is carried by a rod which is connected at one end to the lever E and at the other end to the plunger B. The plunger B and valve A, which slide in liners fixed in the conduits f, f^1, are preferably of the same area, so that the arms of the lever E may be of the same length. In a modification, the plunger B is arranged as the discharge valve, lateral openings in the plunger being adapted to register with openings in the side of the conduit f^1 when the float is raised. The cover, which has a flange fitting into a groove in a flange on the casing F, is provided with a baffle opposite the steam inlet F^2. The bearings of the lever E are open on their underside, so that the lever and connected parts may be easily removed.

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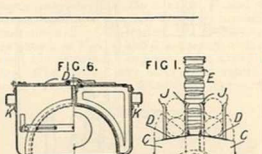
508. Watson, F. L. Jan. 8.

Boiling-pans.—In a portable destructor for the use of military field-hospitals, camps, and the like, a refuse-consuming furnace A is partly surrounded by a double boiling-tank C, in one side of which infected stools, and in the other infected clothing, may be boiled. Fig. 1 shows one form, mounted on wheels, and provided with shafts K. Fig. 6 shows another form, which may be carried by a man, in which the tanks are made in two or more sections which are bolted together. Poles may be passed through brackets K to enable the apparatus to be carried by two men. In both forms, the tanks are provided with doors D and outlet stop-cocks H.



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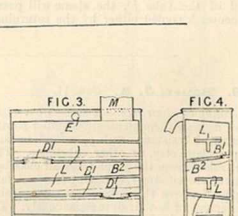
589. Wilson, H., and **Wilsons & Mathiesons.** Jan. 9.

Heating water.—An apparatus for rapidly heating water for baths and for other purposes, consists of an outer fixed casing and an inner removable casing. The outer casing has, in its lower portion, a double wall, forming a narrow space B, and a plate c, forming the bottom of the casing. The inner casing consists of two or more boxes H having inclined top and bottom surfaces, and communicating with each other by apertures D^1, which are connected so as to leave narrow spaces B^1 between the boxes. The apertures of the lowest box are provided with flanges J, which pass through corresponding apertures in the plate C, and are secured by threaded rings K or the like. T-tubes L, passing through the boxes, connect the narrow spaces B^2 formed between the inner and outer casings. Water, entering by inlets F, passes through the narrow spaces B B^1, B^2 to the outlet E, while the gaseous products of combustion from bunsen burners or oil lamps, placed under the apparatus, pass successively through the boxes to the chimney M.



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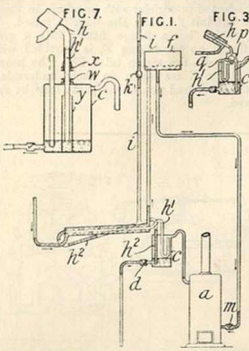
625. Beanes, W. H., and **Walton, H.** Jan. 9.

Heating buildings &c.—In an apparatus for circulation of hot water or other liquid for heating buildings, for baths, or for domestic purposes, the water is forced through the pipes in a pulsating manner by direct action and subsequent condensation of steam. In the form shown in Fig. 1, steam generated in a boiler a passes over into the displacement chamber C, forcing the liquid there into the system through a valve d, the pressure in

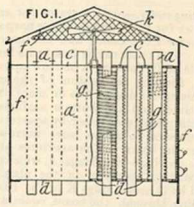
the boiler closing the valve *m*. When the level in the vessel *c* has fallen below the lowest point of the



bend of the tube h^1, the steam will pass into a condenser *h*, cooled either by the returning water or by a separate supply. The reduction of pressure will close and open the valves *d*, *m* respectively, thus filling the boiler and displacement vessel with fresh water from an expansion tank *f* placed at the highest part of the system. The condensed steam passes back to the vessel *c* through a pipe h^2, to which a pressure column *i*, provided with a valve *k* and reaching to such a height as to overcome the total resistance of the circuit, is fitted. This valve and tube also permit of the escape of air or excess of steam from the system. In Fig. 3, an arrangement is shown for regulating the admission of steam to the condenser by the use of a float valve. When the vessel *c* and chamber *p* are full of water, the float *q* rises and closes the entrance to the tube *h*. This remains closed until the water in the vessel *c* falls below the level of the bend in the pipe h^1, when the limb h^2 acts as a siphon and empties the chamber *p*, the float then falling and admitting steam to the condenser, here shown in an inclined position. To adjust the level to which the liquid will be displaced, the device shown in Fig. 7 is employed. The pipe h^1 is movable through stuffing-boxes *x*, *w* in the condenser pipe *h* and the vessel *c*, a wide tube *y* playing the part of the short limb of the U-tube of the other cases. In modifications, the positions of the boiler, condenser, and displacement vessel may be interchanged, or the system may be supplied directly from the boiler instead of the displacement vessel as described, and in other similar ways.

699. Bauer, J. A. Jan. 11.

Heating by electricity.—A series of vertical open pipes *a* passes through an air chamber containing a number of resistance coils *g*, wound on standards of porcelain, clay, or other substance. The pipes *a* are raised from the ground, the air chamber being mounted in a casing *f*, or having feet. A fan *k* may be placed above the tubes, and rotated either by the current of hot air or independently. The top *c* and bottom *d* of the air chamber may be perforated, and space may be left between it and the outer cover. The apparatus may be modified for use as a cooking-stove, the cooking-utensils being placed on the exposed top of the air chamber or in recesses in it.

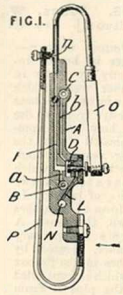


791. Nash, N. E., and **Friedman, W. E.** Jan. 12.

Thermostats.—Relates to apparatus of the kind in which an expanding piece opens or closes a vent in a passage by which compressed air is led to a motor, which actuates a valve controlling the supply of steam or hot water to radiators. The compressed-air inlet B and outlet C, in the shell A, are connected by channels *a*, *b*, to a chamber D, which is in connection with the outer air by a port L and an outlet N. The channel *a* leads to a channel I, provided with a regulating-valve, and passing into a Bourdon spring bent over and fastened to a piece O, to the end of which a valve stem is adjustably fitted. This stem passes through the wall of the chamber D and carries a rubber valve which, when the spring is not distended, closes the inlet of the channel *a* into the chamber D. The nickel and porcelain expanding piece P, the nickel of which is cut away to expose the porcelain to the atmosphere on both sides, is screwed to the bottom of the shell, and, at the other end, is provided with

a hollow regulating-screw containing a piece of raw hide or like substance which normally fills and stops a nozzle *n*, opening from the interior of the Bourdon spring. The apparatus is adjusted to maintain any desired temperature. When the room is below this temperature, the nozzle *n* is opened, the spring relaxed, and the rubber valve closes communication between the compressed-air inlet and the valve-motor outlet; the valve thus remains open and steam or hot water passes into the radiator. When the desired temperature is reached, the piece P contracts so that the nozzle *n* is closed and the Bourdon spring distended, and compressed air passes to the valve motor and closes the valve.

FIG. 1.



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942. Mason, C. L., and **Still, W. M.** Jan. 14.

FIG. 3.

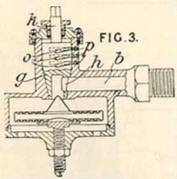


FIG. 4.

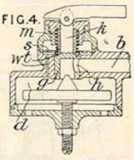
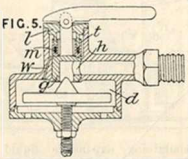


FIG. 5.



Steam traps.—In traps of the kind described in Specification No. 21,571 A.D. 1902, and in other traps of the expanding-chamber type, the valve seating *g* is capable of being lifted so as to enable the valve to be blown through. The seating may be formed as a cock plug having an aperture *h* corresponding with the inlet passage *b*; steam may then be shut off by rotating the seating. The seating may be held in its normal position by a spring *m*, Fig. 4. In order to prevent leakage round the stem *k*, a stuffing-box may be provided, or, as shown in Fig. 4, a flexible diaphragm *s*, attached to a V-shaped ring *t*, may be used. In another case, shown in Fig. 5, the diaphragm *s* is dispensed with, and the ring *t* is formed with an annular channel, into which fits an annular projection on the plug *l*. In the modification shown in Fig. 3, the seating is formed with grooves *o*, which engage with the studs *p*. When the spindle *k* is turned, the seating moves away from its valve. The upper part of the seating, and that part of the casing in which it works, may be screw-threaded. According to another modification, the seating *g* projects into the chamber *d*, and the projecting portion is attached to a lever extending through the wall of the casing. In the arrangements shown in Figs. 4 and 5, a passage *w* is cut between the chamber *d* and the space above the seating. The seating may be made to return to its normal position, when released, by means of a spring.

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979. Heide, H. C., [*Bailey, F. T., Brown, W. P.,* and *Bailey, M.*]. Jan. 14.

FIG. 1.

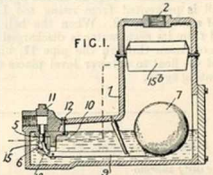
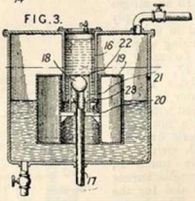


FIG. 3.

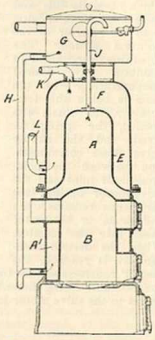


Steam traps.—Consists in providing means whereby the outlet passage of a steam trap is instantly and fully opened when the liquid reaches a certain level, and is suddenly closed when a certain amount of liquid has been discharged. One form of steam trap, shown in Fig. 1, is provided with an inlet passage 2, and a discharge pipe 5, at the lower end of which is a seating for a metal ball-valve 6. The ball is retained upon its seating by the pressure of steam, but when the water in the casing 1 reaches a certain level, a float 7, at one

end of a lever 9, pivoted on a bracket 10, rises, and forces the ball away from its seating by means of a yoke 14, pivoted to the other end of the lever, and water escapes through the pipe 5. As the float falls, the ball-valve is lifted by the end of the lever until it is close to its seating, when it is closed by the rush of fluid. The ball-valve is guided by means of fingers 15 attached to the bracket 10. To make the removal of the ball valve more certain, a tip-bucket 15^b is provided, which dumps the water into the chamber intermittently. To allow for the removal of the discharge pipe 5, with the valve 6, and float 7, the bracket 10 is secured to the discharge pipe 5, and the pipe and bracket are secured in position by means of a taper plug 11 and a stay bolt 12. The float and lever may be removed through a suitable door in the casing. Another form of steam trap, shown in Fig. 3, is provided with a discharge pipe 17, the upper end of which is closed, when the water in the trap is below a certain level, by a ball 18, which is light enough to float in water. When the water in the trap rises, a float 19, surrounding a cylindrical casing 16 and the pipe 17, and provided with arms 20, upon which a series of uprights 21 are mounted, to form a cage, also rises, and lifts the ball 18 by means of lugs 23 on the uprights 21. The ball is prevented from rising too high by means of a ring plate 22. When the ball is thus removed from its seat, water is discharged by the pressure of steam through the pipe 17, until the return of the float to a lower level places the ball on its seating again.

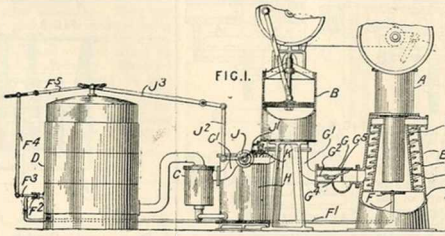
1026. Jones, W., [*trading as* Jones & Attwood]. Jan. 15.

Heating water.—Water is heated indirectly by water in another vessel which receives its heat directly from a fire &c., heat being communicated from the latter vessel through a metal plate which separates the two bodies of water. In the form of apparatus shown, the vessel A forms the primary chamber, heated by the fire in the firebox B, which is kept filled by the pipe H from the cistern G as the steam &c. escapes by the pipe J. The supply water enters the lower part A^1 of the boiler. The water in the vessel F is in contact with the outer shell E of the vessel A. The pipes K, L are respectively flow and return pipes from the second vessel F.

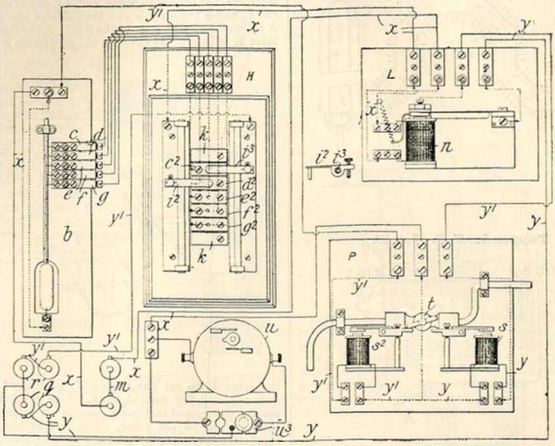


1591. Shiels, A. Jan. 21.

Heating air; thermostats. — In an air-gas plant, the air supply is heated in a heater E comprising a spiral passage formed by walls E^2, E^3 and baffle-plates E^5, E^6. The heater is shown as disposed within the base of a hot-air or atmospheric engine A, which drives the air-supply pump B, and the engine burner F serves also for the heater. The heater may be heated from the engine exhaust or otherwise. The burner F is, preferably, supplied with gas from the gas holder D, through a pipe F^1 having a plug cock F^2 controlled from the bell by means of connections F^5, F^4, F^3. The pipe G^1 leading from the heater E is fitted with a thermostatic regulator G, shown as a capsule or chamber G^2 containing expansible liquid and actuating a lever G^4 adapted to open a spring flap or valve G^5 for cold air; or the regulator may control both a hot-air and a cold-air supply valve, or it may control the heat supply.



1704. Rennert, O. Jan. 22.



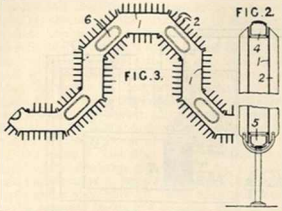
Thermostats.—Relates to an electrically-operated thermostatic apparatus applicable to vats of beer, wort, or lye, furnaces or kilns, rooms and buildings, &c., or as a maximum and minimum thermometer. The arrangement consists of a contact thermometer *b*, a switchboard H for adjusting the maximum and minimum points, and a relay L which puts in and out of action apparatus P controlling the supply of heating or cooling medium. The several contacts *c* . . *g* of the thermometer are connected to insulated contact-pieces c^3 . . g^3 on the switchboard. On each side of these pieces is located a metal strip carrying a metal rod upon which a movable contact-arm is mounted. As shown in the Figure, the maximum temperature is controlled by the contact-arm i^2, and the minimum temperature by the contact-arm i^3. When a maximum or minimum temperature only is required to be indicated, one arm is moved on to one of the plates *k* which have no connection with the thermometer. The arms i^2, i^3 may be provided with conically-ended pins which pass into holes in the contact-plates. The apparatus P consists of two electromagnets having as armatures levers adapted to turn the tap *t* in opposite directions. When the mercury in the thermometer falls below the minimum, the relay solenoid *n* contained in a circuit *x* is de-energized, thus closing a circuit *y* in which the solenoid S of the apparatus P is contained. The tap *t* is then turned so as to admit more heating-fluid. When the mercury in the thermometer rises above the minimum, but not above the maximum, the solenoid *n* of the relay is energized and the circuit *y* broken. When the maximum is passed, the other solenoid s^2 of the apparatus P, which is contained in a circuit y^1, is energized, and the tap *t* thus turned to shut off the supply of heating-fluid. A battery *m* is contained within the circuit *x*, other batteries *r*, *q* being arranged within the circuits *y*, y^1. In order to avoid waste of current, a clockwork contact-breaker *u* may be employed to make and break the circuits *y*, y^1 at regular intervals. A plug switch u^3 is arranged to place the contact-breaker in or out of the circuit.

1740. Lidvall, J. A. Feb. 27, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

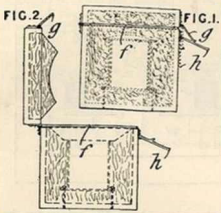
Heating buildings &c.—The side walls of radiators are made in separate flat or curved pieces 1 having ribs 2 on one side. These side-pieces are secured together with top and bottom pieces 4, 5, so as to form radiators of wave-shaped or similar horizontal section. Some of the top and bottom pieces 4, 5, which may be of curved cross-section, are provided with soot holes 6.

(*For Figures see next page.*)

1740.



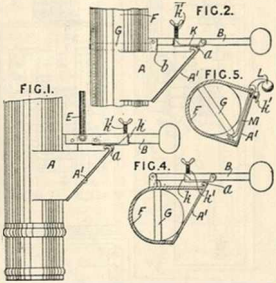
1780. Tappendorff, J. Jan. 23.



Heat-retaining chambers.—Heat-retaining chambers for cooking-vessels &c. consist of boxes lined with hay or other insulator enclosed in canvas or sacking, having a space in the middle in which is a cylinder of mica, asbestos, &c., screwed or bolted to the bottom. The lid, which is also lined with hay and may have a fireproof lining fitting round the top of the contained vessel, may be made to fit the box tightly by rubber strips *f* let in on the upper edges of the sides of the box. To close the box, the hasp *g* is passed over the stud on the lever *h*, and the lever pulled down.

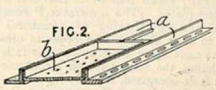
1782. Barry, H. A. L. Jan. 23.

Thermostats.—For automatically regulating the draught in stove-fires and the like, a pivoted door is provided at the side of the flue and adapted to be opened by the expansion of the flue itself, or by the expansion of a bar of metal arranged within the flue, according to the degree of heat which is generated in the stove. In the case of a vertical flue or stove pipe F, as shown in Fig. 1, an air inlet A is provided with an inclined pivoted door A^1, the top of which has a projection *a*. A weighted lever B, pivoted at one end, bears upon the projection *a* and also has jointed to it a rod E, the upper end of which is fixed to a strap on the pipe F. As the temperature of the flue gases increases, the pipe F expands, and, by means of the rod E, raises the lever B and thus allows the door A to open and admit air to the flue. A regulating-lever K is interposed between the projection *a* and



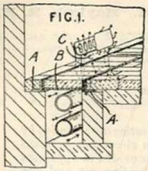
the lever B to set the degree of opening of the door required for normal work. This lever K is pivoted at one end and bears against an adjusting set-screw K^1 at the other. The free end of the regulating-lever may be graduated to indicate the amount of opening for different temperatures. Instead of operating the lever by the expansion of the stove pipe, a metal bar G, Fig. 2, may be arranged across the stove pipe so that the expansion of its free end may communicate motion to a projection *b* on the lever B, and thus open the door A^1 as before. This construction is also applicable to brick flues, in which case a rod within a tube of different expansibility may be used, the differential expansion being caused to operate the lever B and door A^1. When the apparatus is applied to a horizontal stove pipe, as shown in Fig. 4, the rod G bears directly against the lever B. In another modification, shown in Fig. 5, the weighted lever is dispensed with, and a weight L is attached to the door A^1, while the expansion of the rod G gives motion to a pivoted lever M which which bears against an adjustable screw k^1 on the door.

1924. Richardson, W. Jan. 26.



Heating buildings.—The trenches which convey

pipes for heating and other purposes in public buildings, such as schools and halls, are covered by a series of cast-iron trays or troughs *b* resting on side frames *a*. Air ducts *c*, covered by gratings or otherwise, may be used to lead hot air into the room. The trays may be filled with wood blocks screwed to the bottom, or with concrete or mosaic to agree with the flooring of the room. They may be lifted from the side frames by means of slots formed in the castings. The bases of the side frames are also formed with a series of slots by which they may be cemented firmly to the tops of the trench walls.

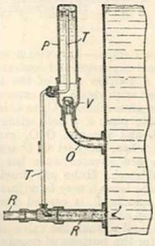


1978. Mackay, F. N. Jan. 26. *Drawings to Specification.*

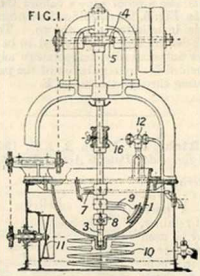
Non-conducting compositions.—The floors, walls, and doors of cold storage chambers are constructed partly of a concrete formed of granulated or powdered cork, charcoal, &c., mixed with Portland cement, lime, plaster of Paris, &c. and water, and either moulded or used as a concrete, and partly of a mixture of granulated or powdered cork &c. with silicate cotton, asbestos, or other similar finely-divided and fluffy substance, so that the chamber is easily cleaned and affords protection against heat, moisture, fire, and vermin.

2356. Porta, G. Jan. 30.

Heating water.—To increase the circulation in water-heating apparatus, a jet of steam and water is discharged from a tube T into a pipe R for conveying water to or from the heating-apparatus. The tube T extends nearly to the top of the chamber P which should be exposed to the furnace gases, and receives water from the heating system through a pipe O having a check valve V.

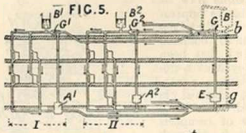


2357. Howorth, F. W., [*Soc. Française de la Viscose*]. Jan. 30.



Heating liquids.—Apparatus for purifying viscose consists of a metal hemispherical basin 1, heated by means of a water bath, which is itself heated by a coiled steam pipe 10, and the temperature of which is maintained uniform by an agitator 11. A thermometer is inserted in the bath. An automatic regulator 12 shuts off the supply of steam when the maximum temperature is reached.

2445. Obrebowicz, C. Feb. 1.

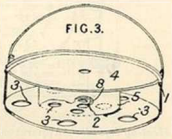


Heating water; heating buildings &c.—The circulation of water in the heating-pipes is accelerated by the application of an injector G which is supplied with hot water, steam, or a mixture of both from the heater E. Fig. 1 shows the application of this system to an existing installation, shown dotted. The old boiler A may be heated independently, or merely serve as a reservoir to prevent stoppage of the circulation through intermission of the action of the heater E, which takes only a portion of the circulating water. In an independent installation, the vessel A may be

omitted, the pipe *b g* only being retained. Expansion cylinders H, B, connected by an overflow pipe *t*, *u* to prevent abnormal driving pressure, are fitted, as is also a relief pipe *v* behind the injector nozzle. In Fig. 5, the modifications necessary for a multiple installation are shown. The usual regulating-devices may be provided to be actuated by hand or automatically, temperature adjustment being provided for by regulation of the part of the water passing through the heater E.

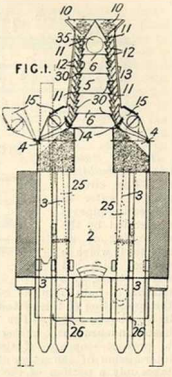
2552. Rich, J. March 2, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

Heat-storing apparatus; bed-warmers.—A portable heat-retainer, which may be used as a bed-warmer or footwarmer, consists of a sheet-metal receptacle 1, having apertures 3 in the bottom, which is filled with a mixture of sand and cement While the filling is plastic, a cover 4 with a perforated depending wall 5 is applied. A flue is made through the centre, and cells are formed in line with the holes 3 in the bottom.

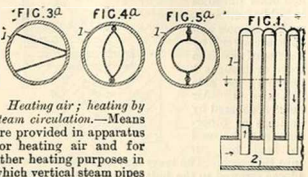


2618. Newhall, G. M. Aug. 10, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

Heating air.—Relates to apparatus for drying animal charcoal which has been employed as a decolorizing agent. The charcoal is passed outside a series of compartments 5, through which waste gases from the revivefying-kiln 2 pass, while air, heated in a chamber 26 surrounding the lower part of the retorts 3, passes up through the descending charcoal. The air from the cooling chambers 26 passes through valved pipes 25 to chambers 15 which communicate with the passage ways 11.

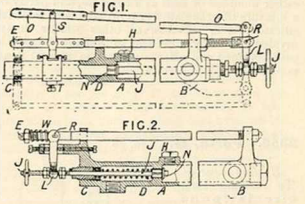


2791. Haylock, R. H. Feb. 4.



Heating air; heating by steam circulation.—Means are provided in apparatus for heating air and for other heating purposes in which vertical steam pipes 1, closed at the upper ends, are employed, for clearing them of air. This is effected by providing within them open tubes or channels of various shapes such as are shown in Figs. 3a, 4a, and 5a, adapted by bending or cutting away part of the lower ends, to deflect the steam current passing through the lower header 2, through the pipes 1. Air and condensed water pass down with the steam through the outer channels in the pipes, and are swept along the header 2 by the steam current, the air being expelled either through a steam trap or through cocks. The tubes or channels are preferably formed so that they fit tightly within the pipes 1, being retained by their elasticity.

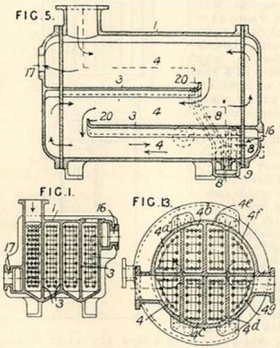
2807. Granger, W. A. Feb. 4.



Steam traps.—In a steam trap, operated by the thermal expansion and contraction of a metal tube, only a portion A B of the body is normally in contact with steam, the extension C D being open to the atmosphere. Upon this extension is an adjustable piece T which, acting through the levers S, L and the rod O O, causes the valve N to open when the part C D contracts. The levers S, L are pivoted on a bar E R preferably of nickel steel. Holes are provided in the bars so that the lever S may be adjusted with the piece T. The spindle J is carried through the body of the trap so as to lessen the steam pressure on the valve, and so that the valve may be turned on its seat for the purpose of re-grinding it. The grinding-materials are introduced through the hole H. The valve may be so arranged that the steam

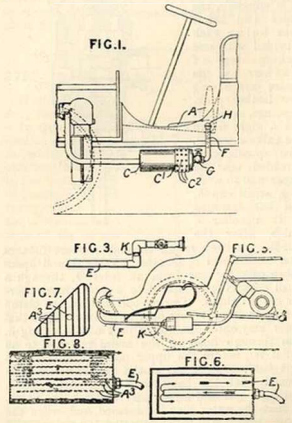
pressure tends to open it. In this case the rod and levers shown in dotted lines in the Figure are employed. In a modification, which in Fig. 2 is not shown with an adjustable piece T, the valve-spindle is taken through the extension C D, and the valve is spring-balanced. In order to allow the trap to be blown-through by hand, a slot is formed in the end of the lever R. Normally the end of the slot is pressed against the fulcrum pin by a spring W.

2842. Morison, D. B. Feb. 4.



Heating liquids.—Surface apparatus for condensing steam, applicable also for heating liquids by means of steam, is divided into a series of compartments which in some cases are of different capacities in order to obtain a uniform and high surface velocity throughout the apparatus. The water of condensation is drawn away from each compartment to the hot-well. Fig. 1 shows an apparatus in which the body 1 is formed with partitions 3 which divide it into compartments of equal size. The bottoms of the compartments are inclined and drain through water-sealed passages into a hot-well formed in one with the body. Each end of the body is closed by a tube-plate and a cover which has partitions for guiding the water through the compartments in the direction opposite to that of the steam. The water enters the apparatus by a passage 16, from which it passes to one compartment in the cover, and leaves the apparatus in a similar manner by a passage 17. Gaps are left at alternate ends between the divisions 3 and the tube-plates to permit the passage of the vapour, and these gaps become smaller towards the cold end of the apparatus. In the modified apparatus shown in Fig. 5, the partitions 3 are approximately horizontal, and the chambers 4 are of different volumes. The partitions are formed with a ledge 20, and incline to one side of the apparatus, where water of condensation is drawn off through passages 8 to a hot-well 9. The supply and outflow openings 16, 17 are formed in the covers. The apparatus may be modified by curving the partitions 3 upwards with drainage passages at each side. In another modification, the hot-well is made separate from the condenser, and the water of condensation drains into it through pipes with water-sealed traps. The apparatus may be modified by causing the water to flow twice in opposite directions through each steam compartment by means of deflectors or partitions in the end covers, or the steam may be reversed twice for one reversal of the water by means of partitions in the condenser body at right-angles to one another, as shown in sectional plan in Fig. 13. The steam flows from the chamber 4 to the chamber 4^a and through the chambers 4^b, 4^c, 4^d, 4^e, 4^f, 4^g in the order indicated. When the apparatus is used for heating water, the steam may in same cases pass through the tubes. The Provisional Specification describes a vertical cylindrical apparatus divided into compartments by radial partitions.

2901. Phillips, W., and **Humber, Ltd.** Feb. 5.



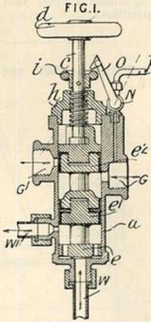
Footwarmers.—In a motor road vehicle, a foot-warmer is heated by the exhaust of the motor and

arranged so that access is easily obtained to the underframe without removing the warmer. When fitted to a tandem or tricar having its forecarriage supported on springs, injury to the apparatus is prevented by a flexible connection. Fig. 1 shows one form of warmer A connected to the silencer C. An adjustable sleeve C^1 is provided, by which the holes C^2 in the silencer are closed so as to force the exhaust through a tap G to the warmer, whence it escapes by an outlet pipe F. The warmer is fitted with a rotatable joint H so as to be raised. Fig. 5 shows the front part of a tandem or tricar in which the pipe E leading from the silencer to the warmer is fitted with a flexible joint K, shown on an enlarged scale in Fig. 3. Figs. 6, 7, and 8 show two forms of a warmer. In the former, Fig. 6, a metallic casing, provided with a water jacket, is fitted with an inlet pipe E and outlets for the exhaust. In the latter, Figs. 7 and 8, a metallic casing, provided with an inlet pipe E and outlets, is fitted with baffles A^3.

3583. Eickershoff, J. H. Feb. 12.

Heating water.—Fig. 1 shows a vertical section of a valve for geysers and other apparatus. Three pistons *e*, e^1, and e^2 are mounted on a spindle *c*, the upper and lower ones being each provided with one packing-ring of leather, and the centre one having two leather packing-rings, so that it has a tight fit in the valve-casing *a*. The spindle *c* is threaded near its upper end to work in a screw cap *h*, and has fastened to it a collar *i*, which, after the spindle has been raised through a short distance by a hand-wheel *d*, actuates a lever O, and opens a bye-pass for gas from an inlet G, through a small cock N and pipe *p*, to a gas-burner, where the gas is lighted. During this motion, the piston *e* is raised from its seat on a water inlet W, so that water may enter the lower part of the casing *a*, pass through holes in the metal piston *e*, to an outlet W^1, before the upper piston e^2 uncovers a port leading to a gas outlet G^1. The latter is opened when the hand-wheel is further rotated, and both gas and water pass through the valve, so that the water may be warmed, and, when the hand-wheel is still further rotated, the water outlet W^1 is partially closed, so that hot or boiling water is produced. A forked end of a pointer, which moves over the face of an indicator plate attached to the casing *a*, engages the upper part of the collar *i*, so that the amount of opening of the valve may be adjusted for the supply of cold, warm, or hot water, as desired. The device may be also used for controlling the flow and mixing of liquids and gases in chemical and other apparatus.

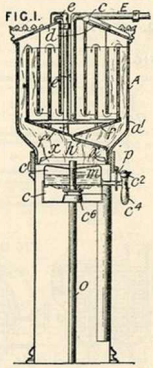
FIG. 1.



3584. Eickershoff, J. H. Feb. 12.

Heating liquids.—Consists of a geyser heated by an adjustable burner in which the vapour of methylated spirits is burnt. The water-heater A, which consists of a number of concentric annular water spaces, is mounted on a reflecting-casing, open at the front, in which a burner slides up and down between two guide rods *o*. The water, which enters the outer space a^1 at the base, passes successively through the annular spaces to a hollow lid *d*, from which a pipe *e* leads to within a hollow pan *f*. This pan, which serves to collect the water of condensation, has an outlet pipe E leading from its interior, and serving as the outlet pipe of the apparatus, while a pipe *h* conveys the water of condensation to a gutter *x* provided with an outlet. The annular spaces have extensions, which cause the products of combustion to pass alternately above and below the sprays on their way to a central vent pipe. A methylated-spirit reservoir c^1, having a concave perforated top, is mounted in a frame *c* above a spirit burner c^5. The vapour of the spirit from the reservoir c^1 is ignited by the flame of the burner c^5 passing through a central opening *m*. A hook *p*, with which engages the pipe leading from a filling-nozzle c^2 and handle c^4 to the reservoir, serves to hold the burner in its uppermost position.

FIG. 1.



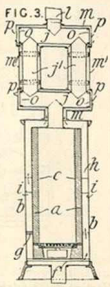
3601. Schutze, F. Feb. 12. *Drawings to Specification.*

Hot-water bags.—A portable douche, consisting of a collapsable bag fitted with a detachable tube having a tap and a nozzle, is provided with screwed caps for closing it at the top and bottom.

3678. Pedrazzi, A. Sept. 8, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

Heating air for use in dwellinghouses or for industrial purposes. The apparatus comprises two concentric cylindrical jackets *a*, *b*, the inner one being lined with a refractory material *c* and containing a fire, which is supported by the grate *t*. Air to be heated enters the annular casing through the pipe *f* at the bottom, and passes up into the annular spaces between the pipes or "tubular casings" *m*, *m*¹, *j*, *j*¹, which may be variously arranged. Hot gases and smoke from the furnace pass through the internal pipe and escape by the pipe *l*.

FIG. 3.

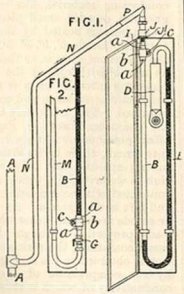


The heated air is carried away through delivery mouths *p*, which may be fitted with registers. In order that the air may be heated uniformly, perforated rings *g*, *h* are arranged within the jackets *a*, *b*, the holes in one ring being opposite those in the other, and a partition *i* extends from the lower ring to within a certain distance of the upper one. A register is arranged above the lower perforated ring for regulating the admission of air to the apparatus. The pipes *j*, *j*¹ when of sheet metal are connected by rivets. They are provided with plates *o*, which may be removed for cleaning purposes. The outer pipes *m*, *m*¹ are screwed together and are kept concentric with the inner pipes by means of staying-screws, which pass through the surface of the outer pipes and bear against the inner pipes. In addition to the ordinary furnace door, a small feed-aperture is arranged at the top of the furnace for use when working with continuous firing. Pipes may be connected to the hot-air discharge outlets *p*, for conveying the air to the place where it is to be used. The apparatus may be arranged with several "tubular "casings" side by side or in series, or they may be star or ring shaped.

3741. Mackintosh, C. Feb. 15.

Heating water.—A safety-valve of the kind described in Specifications No. 24,622, A.D. 1895, and No. 3177, A.D. 1900, adapted for kitchen boilers, water heaters, &c., is shown in Fig. 1. The flow-pipe A or other source of pressure is connected by pipes N, P to a U-tube B containing mercury, the free end of which is curved and dips into a receiver D. The closed limb of the tube is filled with a liquid to preserve the mercury from oxidation, and to ensure the action of the apparatus. A rise of pressure in the pipe A drives the mercury into the receiver, which may be hermetically sealed, or fitted with an escape pipe to extinguish the fire. To facilitate the connection of the tube B to the pipe P, a short metal connecting-pipe I is connected to the tube B by dermatine tubing which is encased in a metallic spring tube *a* secured by a spring clip *b* and thumb-nut *c*. The tube I is secured to the case E, in which the apparatus is placed, by a screw nut J¹ having holes in its rim for connection to the case. The screw nut is surmounted by a socket J and a union-piece having a cup-shaped end to act as a funnel for convenience in filling the U-tube. The closed limb of the U-tube may be made of metal, as shown at M, Fig. 2, and connected to the glass part B by the means described for the metal connecting-pipe I, Fig. 1. A cock G may be fitted, as shown in Fig. 2, between the glass and metal parts B, M.

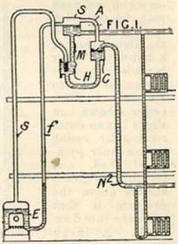
FIG. 1.



3797. Reck, A. B. Feb. 15.

Heating buildings &c.; heating water.—In a hot water heating-apparatus in which the circulation is increased by the introduction of steam into the rising-water pipe, the condensation of part of the steam so introduced is effected by the cooled water returning from the radiators. A tank C, into which the water from the radiators flows through the pipe N², is connected to the separator S, and with the rising-water pipe M at a point immediately below the delivery end of the steam pipe *s*. The separator S is in communication with the steam generator E through the overflow pipe *f*. When the water is heated by the heater H, the water level in the separator will rise, and steam in the

FIG. 1.

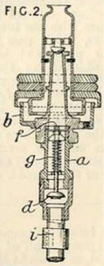


upper part will pass over into the vessel C and be condensed. The delivery end of the pipe N^2 is arranged at a higher level than the water in the tank C. In a modification, the tank C is open to the atmosphere, and the pipes A, N^2 then open below the water level.

3838. Saunders, S., and **Roberts, T.** Feb. 16.

Heating water.—In connection with a dead-weight or other safety-valve *b* for the boilers of hot-water heating-apparatus or the like, an additional lift valve *d* is used to close the escape pipe *i* when the valve is removed for repairs, thus obviating the necessity of emptying the pipes or apparatus. The safety-valve is screwed to a nipple *a* containing the valve *d*, which is closed by a spring *g*. A stop *f* formed on the safety-valve depresses and opens the valve *d* when the valve *b* is screwed into position.

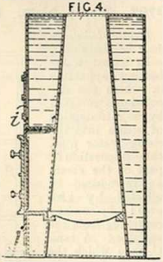
FIG.2.



3905. Emley, A. Feb. 16.

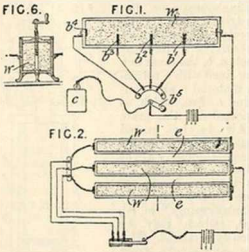
Heating water.—In order to avoid horizontal surfaces on which sediment may be deposited in the water space, the firebox shell of a hot-water boiler is made inclined or vertical from top to bottom. The boiler shown in Fig. 4 has an outer rectangular casing and an inner pyramidal shell, and the only horizontal surface above the firegrate is that over the fire-door arch. A large manhole *i* is provided for clearing out deposits on this arch. The boiler may also be constructed with three vertical faces to the inner shell and one sloping face either at the back or at the front; or with the back and front vertical and the sides sloping. The outer casing may also be angular, pyramidal, conical, or cylindrical, and the inner shell may be conical.

FIG.4.



3912. Soc. Anon. l'Industrie Verrière et ses Dérivés. Feb. 18, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

FIG.6. FIG.1.



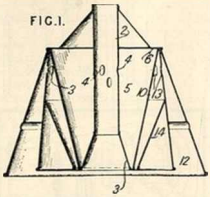
Heating by electricity; heating buildings.—An electric heating-apparatus, for use in connection with driers, chambers, ships' cabins, vehicles, and particularly as a simultaneous heating-apparatus and current regulator in electric railways, consists of one or more layers of a conducting or semi-conducting material, like carbon, in the form of granules, powder, small pieces, flakes, or filaments, which become heated by the passage of an electric current. Leads b^1, b^2, b^3, b^4, Fig. 1, are placed in the resistance-mass *w*, so that, by simply connecting an arm b^5 with one of the leads, or by letting a register *c* into the mass *w* at a convenient place, the desired resistance and consequent heat effect is obtained. The leads may be kept at the end of the resistance-masses *w*, Fig. 2, and the required effect obtained by introducing one or more layers *w* into circuit, these layers either being in contact or having spaces *e* left between them. A modification is described in which the current mains are connected with contact-pieces on a vertical right and left handed screw. As these pieces approach or recede from each other, they make contact with leads projecting through the side of a vertical vessel containing the resistance-mass. The regulation is obtained in the arrangement shown in Fig. 6 by the compression of the resistance-mass, the conductivity of which is thereby altered.

3989. Trimble, J. S. March 2, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

Boiling-pans.—In a device for use in washing clothes, a central funnel 2 is provided, having a handle socket at its upper end, a flared lower end 3, and a series of holes 4 in its upper walls. An imperforate horizontal plate 6 is attached to the funnel above and near the holes 4, and a series of three concentric frustum-shaped shells 5, 10, 12 are secured to the plate 6 at their upper ends. The shell 10 is divided into two compartments by

a diagonally-arranged imperforate partition 14, so forming a contracted opening at the lower end of the shell. Holes 13 are provided in the upper walls of the shell 10. It is stated in the Specification that, in use, the apparatus is placed in a

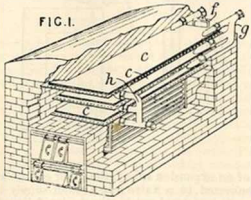
FIG.1.



tub, pail, &c., containing the clothes, and that the water rises in the funnel 2 and chamber 12, and flows through the holes 4, 13 respectively into the chambers 5, 10, from which it is discharged with considerable velocity through the contracted openings at the lower end of these chambers, thus effectually cleansing the clothes.

4250. Cotton, G. Feb. 20.

FIG.1.



Heating water—A hot-water boiler is composed of a number of closed shallow trays or casings *c*, Fig. 1, connected by flow and return connections *g*, *h*, and supported by brickwork of fire-clay blocks grooved and held together by dowels with or without the use of mortar. The separate units are formed with flanges, and are supported alternately at the front and rear ends so that the smoke &c. passes under and over each of them to the flue outlet which is controlled by a damper *f*. The flow and return connections are joined by branch pipes when the trays serve the same system, or circulating pipes are used between the trays. The trays may be of a flat saddle shape and rest on one

FIG.8.

FIG.9.

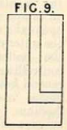


FIG.4.

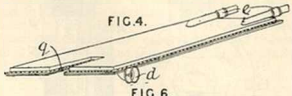
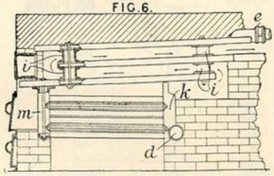


FIG.6.

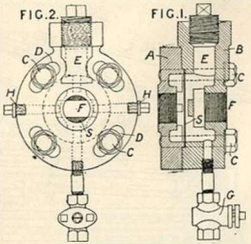


another, and they may be supported on all sides and be formed with flue apertures *q*, Fig. 4, at alternate ends. The furnace grate may be tubular, the front and rear headers being attached to the lower boiler unit. The different units may be used as separate boilers by joining the flow and return connections *e*, *d* of each to its own circulating system. Instead of making each tray in two parts bolted together as above, they may be cast each in one piece and united together by flanged tubes *i*, Fig. 6, and bolts as shown, the flow and return-pipes *e*, *d* being attached to the upper tray and the rear header as shown. The front header *m* is U-shaped to allow access to the furnace and is attached to the lower tray and the rear header by bolts, the ends of the tubes being slightly reduced so as to form tight joints on screwing up the nuts. The rear header *k* is cut away to form an outlet for the smoke &c., and acts as a baffle to direct it to the flue.

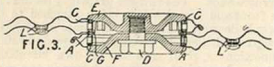
4331. Butterworth, J., and **Lancaster & Tonge.** Feb. 22.

Steam traps.—A coupling, used in connection with steam traps and like apparatus, is fitted with a sieve for arresting dirt or sediment in the inflowing water, and is made with alternative inlets so as to facilitate connection with the drum pipe. Two discs A, B are fastened together, by bolts, studs, or screws C, with a metal sieve S interposed between them. In addition to the ordinary inlet F, another E is provided in the edge of the coupling. The disc B may be shifted so as to bring this latter inlet into four different positions. Holes are provided for the mud tap G, so that it can, in any case, be placed at the bottom of the coupling. The boltholes D are slotted. The coupling is made steamtight by means of a copper

or other soft metal ring, or by filling the edges of the sieve with solder, red lead, or other material.



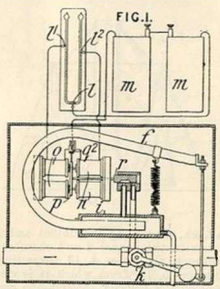
4392. Fouché, F. Jan. 21, [*date applied for under Patents Act, A.D. 1901*].

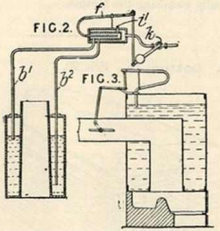


Heating liquids and gases.—Liquids &c. are circulated through corrugated or other hollow plates arranged in parallel or series and connected together by joints of the form shown. An asbestos, india-rubber, or like washer A engages circular grooves in two adjacent plates which contain apertured distance-rings C pressed together by flanged plugs E, F connected together by a screw D. The plugs may be soldered to the edges of the orifices, and the plug E may carry an apertured guide-ring G to hold the washer A in place. The plates may be strengthened by bolts located in recesses L, or by eyelets or short metal tubes expanded at their ends, washers being clamped under the flanged parts or these parts being soldered.

4419. Brukenhaus, R. Feb. 22.

Thermostats; heating water.—A closed expansion tube serving to actuate cocks, slides, valves, or the like, is surrounded in part only by the medium in which it is placed. The tube, which is filled with a liquid or an easily-liquefied solid such as naphtha, is closed at both ends. Fig. 3 shows such a tube arranged to control the draught in the furnace of a low-pressure hot-water boiler. One end of the tube is fitted in the boiler and the other end is connected through levers to dampers in the flue. Fig. 2 shows an arrangement for maintaining the water in a boiler at a constant level. The boiler is connected by two pipes b^1, b^2 to a regulating-apparatus which consists of an inner and an outer chamber. Within the inner chamber is fitted one

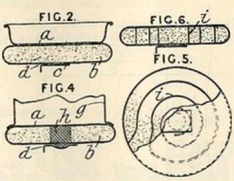




end of an expansion tube f, the other end of which is connected to a valve k in a water-supply tube. When the water level in the boiler falls, steam passes through the pipe b^1 to the inner chamber of the regulating-apparatus, which is provided with an escape valve i^1. The expansion of the tube f opens the valve k, allowing water to flow through the outer chamber of the regulating-apparatus to the boiler. In an arrangement, Fig. 1, for controlling the temperature of rooms heated by a central heating installation, an electrically-operated device controls the admission of the heating-medium. Within a chamber i is fixed the end of an expansion tube f arranged to actuate a valve k in the heating-pipes. A mercury thermometer has three terminals l, l^1, l^2 which are connected to a battery m and electromagnets o, n respectively. Between the electromagnets is arranged an armature p, which is connected to a slide valve r controlling the admission of the heating-medium to

the chamber *i*. The armature *p* is also connected to a switch q^3 which, when either of the electromagnets becomes excited, is adjusted for the subsequent flow of current to the other electromagnet. When the temperature rises too high, the thermometer makes contact between the terminals *l*, l^2. The electromagnet *o* is thus energized, attracting the armature *p* which closes the valve *r*. The expansion tube contracts, allowing the valve *k* to be closed by a weight k^6. When the temperature falls too low, the thermometer makes contact between the terminals *l*, l^2. The electromagnet *n* is thus energized, the valve *r* opened, and the heating-medium admitted to the chamber *i*. The expansion of the tube *f* then opens the valve *k*.

4580. Bamberger, M., and **Böck, F.** Feb. 24.

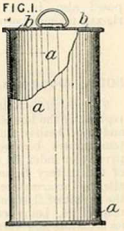


Heating by chemical action.—A slow-burning composition for use in heating beverages, food, preserve-tins &c. consists of a finely-powdered mixture composed of a heavy metal, such as iron, copper, or zinc, with sulphur or an oxidizing-substance such as a permanganate, nitrate, chlorate, or perchlorate, and an inert or retarding substance such as burnt clay, iron oxide, silver, gypsum, or the like. The composition may be pressed into cakes or blocks, and may be hardened by moistening with water and re-drying. Combustion is started by a match, faze, or primer. Preferably the mixture consists of potassium permanganate, finely-divided iron, and dehydrated gypsum, and is placed in a flat box *b*, upon which the vessels to be heated are placed; or the composition may be contained in a hollow stirrer or dipper. Vessels with double bottoms filled with the composition may also be used. Strips or corrugations *i*, Fig. 6, may be disposed in the box, to lengthen the path and duration of the combustion. In each case there is a hole *d* which is temporarily closed by a piece soldered on, or otherwise fitted airtight, through which the match &c. is introduced; or a primer *h*, Fig. 4, of pyrophoric iron may be provided which ignites fire when the soldered piece is withdrawn.

4637. Perrier, O. Feb. 25, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*]. *Drawings to Specification.*

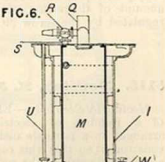
Thermostats.—In distilling-apparatus, the temperature is regulated by circulating the vapour through a cylinder containing an air and water chamber, from which variations in tension are transmitted to a mercury cup and cause the rise or fall of a float connected to the valve which controls the supply of liquid for distillation.

4739. Barker, A., and **Sidebottom, H.** Feb. 26.



Heating-apparatus; bed-warmers.—A device for heating bed-clothes and for like purposes, consists of a vessel *a*, preferably cylindrical in shape, and made of sheet tin, copper, or other metal. Silicate of lime is introduced into the vessel, which is then closed permanently by a lid *b*, screwed or otherwise fitted into the vessel, and provided with a screwed plug or cap. The vessel is heated in front of a fire or within an oven, and is afterwards placed between the bed sheets, preferably on its end so as to hold the sheets in the form of a tent. The vessel is provided with a handle for carrying purposes.

4767. Rigg, J., and **Spencer, S.** Feb. 26.

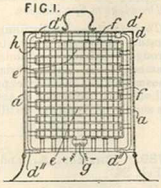


Heating water.—Relates to apparatus for heating water for, and diffusing vapour in, conservatories, rooms, &c., and more particularly for medical use for asthmatical and bronchial patients; also for warming and boiling for cooking purposes. The boiler M is supported on brackets N within a casing I, which is fitted at the lower part with a gas or other burner or heating-device. By means of a three-way cock R in the pipe S, the vapour generated can be passed either into the flue pipe Q or into the room &c. A hot-water tap is shown at W and a gauge-glass at U.

4783. Padris, J. Feb. 26.

Heating by electricity. Wire of resistant metal is arranged to form a fabric or tissue with asbestos thread. The wire *e* passes from one terminal of the insulator *g* to the other in a zig-zag path as shown, interlacing the asbestos cord *f*, disposed also in a zig-zag manner perpendicular to the wire. The fabric is fixed by threads *h* of asbestos to the metal frame *d*, which is coated with non-conducting material and suspended from a casing *a* by rings or hooks d^1 and at the same time supported on rests d^{11}.

FIG.1.

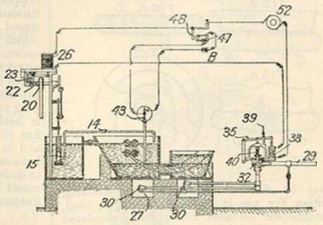


4876. Combined Washer and Hydro-Extractor Co., Hiscox, E. C., and Livingston, T. L. Feb. 27. *Drawings to Specification.*

Heating air.—Air to aid in drying clothes in a hydro-extractor is heated by passing it through tubes situated in a furnace. The heated air is passed through tubes contained in the hydro-extractor and in contact with the articles under treatment.

5009. Goodwin, A. M. Feb. 29.

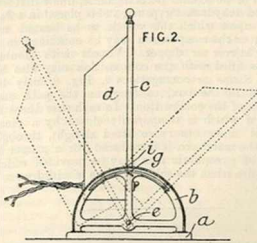
Thermostats.—Relates to means for regulating the temperature of the oil and metal bath in tinning. When the temperature becomes excessive, the pyrometer index 43 closes the circuit of the battery B, and the magnet 47 attracts the armature 48 and completes the circuit of the dynamo &c. 52. The magnet 26, being energized, attracts its armature and turns the bell-crank lever 23 so that the clutch coupling 22 engages the clutch of the loose pulley 20, which accordingly operates the pump 15 by means of the connections shown, to pump cold oil through the pipe 14 into the overheated tank. The magnet 38, also attracting its armature, pulls down the valve 32, normally kept up by a spring 40, and cuts off the supply of liquid fuel from the burners 27. The amount of depression of the lever arm 35 is regulated by the screw 39. The pilot lights 30, being connected directly to the main 29, lights up the other burners when the temperature has fallen again. The circuits of the magnets 26, 38 can be arranged to work independently.



5118. Dowsing, H. J. March 1.

Heating by electricity.—Electric stoves, consisting of a number of electric incandescent lamps arranged in a portable casing with reflectors, are constructed so that this casing can be secured at any desired angle to the vertical. In one arrangement, the casing *d*, shown in side elevation in the Figure, is pivoted at *e* to brackets *b* fixed to the base *a*. Studs *g*, fixed into the side of the casing, pass through curved slots in the brackets *b*, and are provided with wing or other nuts *i*, by means of which the radiator can be fixed in any required position. In an alternative form, the side-pieces *c* of the casing rest on the floor, and have hinged to them at a suitable height a frame or strut, resting on the floor in front of, or behind, the casing, according to the position required. Slotted arms, pivoted to the casing and clamped by means of

FIG.2.



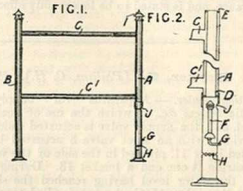
studs and wing-nuts to the strut, serve to secure the radiator in position. The slotted segments or arms, and studs and nuts, may be replaced by segments or arms with ratchet teeth, which are engaged by pawls. The casing may also be constructed so as to turn or slide on its supports in a horizontal plane.

5267. Tyrrell, C. M. C. March 3.

Bed-warmers. — A bed-warmer, similar to a warming-pan, consists of a receptacle for hot water to which is rigidly or detachably fixed a telescopic or jointed shaft having a suitable handle. The receptacle contains an opening for filling and emptying.

5285. Ewart, J. W. March 3.

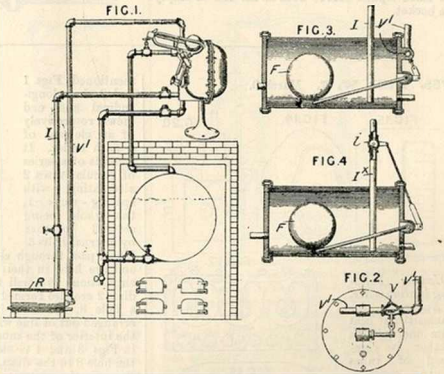
Heating water; heating buildings.—A combined towel-airer and radiator comprises an annular vertical boiler A connected to a chamber B by tubes C, C¹. The boiler is heated by a burner F, supplied with air through a ring of holes H and



with gas from a pipe G. The inner tube D constitutes a flue. Steam can leave the boiler through a hole E, and, with the products of combustion, escape through a cup I. A hole J is made for lighting the burner.

5371. Southwick, C. A. March 23, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

Steam traps. — Relates to means for controlling automatically the speed of operation of the trap in accordance with the quantity of water to be returned to the boiler. Fig. 1 shows a portion of the heating system, and Figs. 2 and 3 details of one arrangement of controller. The vent pipe V¹, for the escape of steam which fills the trap at each discharge, is provided with a valve *v* connected by links and levers with a float F in the intermediate drain receiver R. When the condensed steam accumulates rapidly in the receiver, the float opens the valve *v* wide so that the trap can fill with water through the pipe I and operate as rapidly as possible. With a decreased rate of condensation, the trap disposes of the water more rapidly than it accumulates, causing the float to descend and partially close the valve. With the arrangement shown in Fig. 4, the vent pipe is left open to the atmosphere. The pipe I× leading to the trap is then provided with a rotary valve *i*, which is operated by the float F.



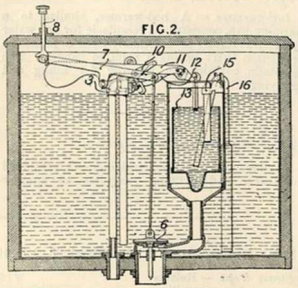
5648. Stringfellow, J. H. W. March 8.

Compositions, non-conductors of heat.—Slagwool blown in the ordinary way is pounded, disintegrated, and gigged to separate shot or other foreign matter. The material prepared in this way has a curly appearance, and is stated to be less readily affected by water, acids, &c. It may be used dry or wet.

5651. Barker, G., [*Phillips, C. H.*]. March 8.

Heating water. Apparatus for supplying domestic boilers &c., in which the use of floats is avoided, and the supply valve is actuated quickly, is provided with an inlet valve 3 actuated by a weighted lever 11, pivoted in the side of the valve and bearing at one end a bucket 13. During the filling, the water level having reached the short limb of the siphon 15, the bucket is filled thereby and closes the valve 3, the plunger of which is fixed to a lever 12 pivoted to the lever 11. On depressing the push 8, the valve 6 is opened and the lever 7 supported by means of a catch 10 provided with a lug, which, on the emptying of the tank and the bucket by the siphon 16, is engaged by the ascending lever 11 and released, so that the valve 6 is closed. The level in the tank at which the bucket commences to empty may be adjusted by varying the length of the enlarged portion of the long leg of the siphon 16. In a modification, the same siphon serves both to fill and to empty the bucket.

FIG.2.



5765. Still, W. J. March 9.

FIG.15.

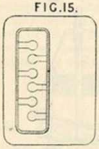


FIG.14.

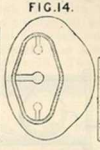


FIG.20.

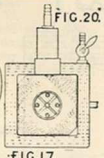


FIG.17.

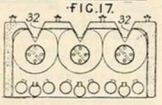
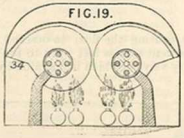
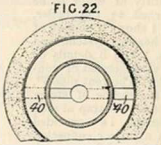


FIG.19.

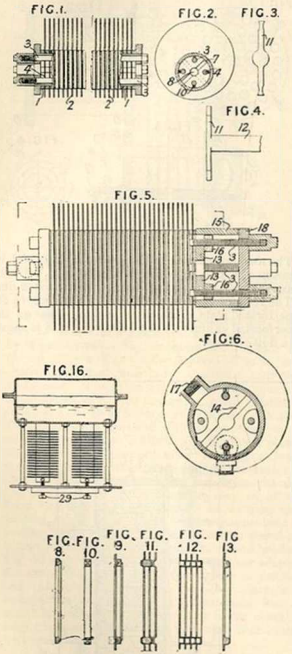


Heating buildings; heating water. — Apparatus for transmitting heat from one fluid to another is composed of tubes having conducting-discs passing through their walls. The applications to steam boilers, water-heaters, geysers, feed-heaters, and radiators are mentioned. Figs. 1 and 2 show longitudinal and end views respectively of an element of a flash boiler. It consists of a series of circular discs 2 alternating with spacing rings 1, the whole being secured together by internal bolts 3. These pass through elongated slots 4 in the plates and are held in their correct positions, to allow circulation, by small tee-bars 10. The plates or discs 2 are also formed with slots 7 radiating from a hole 8, the slots in the several plates being arranged out of line with each other. For cleaning the interior of the tube, the tee-headed tool shown in Figs. 3 and 4 is employed. The part 12 fits in the hole 8 in the discs, and the head 11 is passed through the slots in succession. Figs. 5 and 6 show a tube similar to that described above, but provided with a dummy end 13 to facilitate cleaning. This end 13 is provided with slots 14 similar to the slots 7, and is held down by nuts 16 on two of the bolts 3. It is also provided with a tubular extension 15 forming a steam chest, and is closed at the outer end by a blank flange 18; the steam outlet is shown at 17. By removing the flange 18

FIG.22.

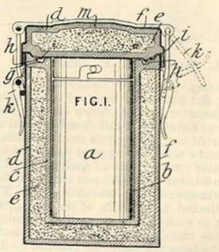


and withdrawing the bolts which are not provided with nuts, the tube can be cleaned as before. Water is supplied through a tee-connection at the end opposite to the steam chest. When furnace gases are passed through the tube, the soot which



accumulates is removed by a wire brush. The discs 2 instead of being circular may be oval, as shown in Fig. 14, rectangular as in Fig. 15, heart-shaped as in Fig. 17, spiral or involute shaped as in Fig. 19, or star-shaped. The heart-shaped discs are particularly applicable where only one row of tubes is employed, as shown in Fig. 17. A baffle 32 deflects the furnace gases downwards on to the central portions of the discs before they escape to the chimney. The spiral or involute discs shown in Fig. 19 attain their maximum width at a point 34 opposite the outlet openings for the heated gases; a baffle is also provided in this case to confine the gases to the spaces between the discs. In vertical apparatus, such as vertical boilers and the like, the discs are preferably rectangular. Fig. 20 shows in plan a geyser fitted with these discs. Each disc has a pair of opposite corners cut away to allow the passage of the flame &c., and the several discs are so arranged that the cut-away corners in one disc alternate with the plain corners of the discs next above and below. For heating feedwater by steam, the discs are preferably circular, with slots 40, Fig. 22. The whole is enclosed in a tight-fitting casing with the slots 40 breaking spaces with each other. In some cases, the securing-bolts 3, Fig. 1, pass through the discs outside the spacing-rings; or they may form part of a frame for securing together the discs and rings of several tubes. The latter arrangement is shown in Fig. 16 as applied to a water-heater, the end-plate 18 of the frame being fitted with screw adjustments 29 for the tubes. For making tight joints between the rings and discs, one bearing-edge of each ring may be reduced in thickness; or the arrangements shown in Figs. 8, 9, 10, and 11 may be adopted. In Figs. 12 and 13, the spacing-rings are shown made in one with the discs. Where desirable, the discs may be of non-corrosive substances, such as glass, earthenware, or vulcanite.

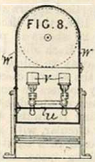
5924. Buhlmann, D. March 10.

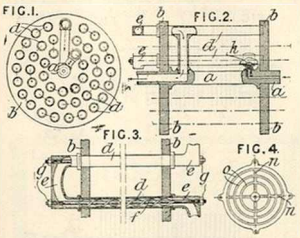


Heat-retaining chambers and the like.—The apparatus consists of a cylindrical vessel *b* with a cover *m*, both having double walls *c*, *d* packed with waste silk or other non-conducting material *e*. The walls *c*, *d* are made of compressed cellulose or wood pulp, and have sheet-metal casings *f*. A projection *i* on the underside of the lid *m* bears upon one or more rubber rings *h* placed in grooves *g* in the upper part of the vessel *b*. The lid is secured by a suitable lever fastening *k*. The substance to be kept warm, or the vessel *a* containing the partly-cooked food, is placed inside the vessel *b*. The vessel *h* may be provided with an annular sheet-metal vessel containing boiling water or sodium acetate, which is melted before inserting the cooking-vessel.

6049. Delizy, J. March 11.

Heating air.—For the instantaneous production of hot air, a tubular structure rotating above a furnace burning coal, or preferably fitted with burners using petrol or alcohol, is employed. Fig. 1 shows a cross-section through the rotary heater, a portion of which is also shown in longitudinal section in Fig. 2. Fig. 3 shows further details of the heating-tube and Fig. 4 a modification of the end-plate of the heater. Fig. 8 shows an end view of the casing of the heater with burners below. The air enters by the central hollow shaft *a* and, after raising the valve *k* against the pressure above it, passes to and fro the length of the continuous coil forming the heater, the coil being supported on end-plates *b*. The inlet to the coil is appreciably smaller than the outlet. The coil is made up of a series of pipes *d* which, having end junction-pieces *e*, are stayed by bolts *g*, the bolts being formed with helices *f*. The dotted arrows in Fig. 1 show the course of the air. The structure is supported on the shaft *a* which is mounted on bearings in a suitable frame. It may be rotated through gearing from the shaft of a motor car. In a modification, instead of using a continuous pipe, the pipes pass across the furnace-space from one side to the other from and to hollow end-plates which are formed with the concentric and transverse chambers *o*, *n*.

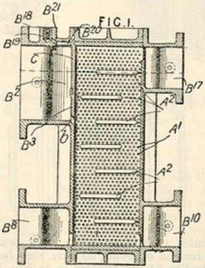


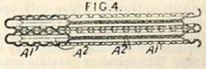


The amount passing to the heater is indicated by means of a pointer which is affixed to a valve of any suitable type and moves over a graduated dial. The rows of burners *v* Fig. 8, are fixed above the perforated plate *u*, which is held in slides on the perforated casing *w*. The heater in Fig. 8 is shown in dotted lines.

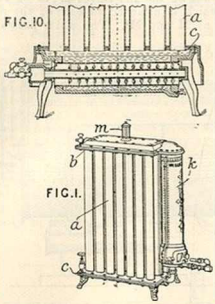
6128. Burdh, A. F. March 12.

Heating gases and liquids.—In surface apparatus, flat plates are stamped or punched as in the steam condenser shown in the Figures, so that a series of small hemispherical or other bosses A^1 are produced on one (the cooling-water) side and a series of staggered parallel ridges A^2 on the other (steam) side of each plate. The plates are so set that the bosses and ridges on the sides of each chamber are opposite each other. Their ends are attached to the ends of the casing, and their edges to each other, by means of molten metal. In some cases, a single, long, bent plate may be used to form the series of chambers. The steam passes in by a conduit B^2 and is forced, by a baffle B^3 supporting a grid C which protects the joints of the chambers, to pass through this grid, any condensed steam passing through the openings *b* into the steam chambers. The condensed steam passes out through the conduit B^4. The cooling-water passes in by the conduit B^{10} and out by the conduit B^{17} after traversing the water chambers. Soda or other cleansing solution may be admitted to the steam conduit B^2 through an opening B^{18} and a passage B^{19} in the wall of the conduit, leading into a chamber B^{20} formed by a recess in this wall closed by a perforated flange C^1 on the grid C. A baffle B^{21} prevents steam from blowing back through the opening The front parts of the steam chambers may be enlarged at the top and bottom.





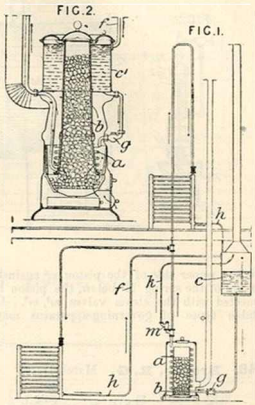
6133. Kane, W. March 12.



Heating buildings; heating water.—A gas heating-apparatus for rooms, greenhouses, &c, in which the use of an expansion chamber is obviated, consists of a radiator of special construction, which may be used with a water-heater or heated directly by a gas burner. Fig. 1 shows the radiator employed with a Kane water-heater. The radiator consists of upper and lower chambers connected by tubes *a*. The tubes *a* are secured to upper and lower plates *b*, *c*. To the upper plate is bolted a recessed cover so as to form an expansion chamber. This chamber is provided with an aperture *m* by which the apparatus is filled. To the lower plate *c* also is bolted a recessed cover forming a lower water chamber. The gas-heated water-heater *k*, which is connected to the upper expansion chamber and to the lower water chamber, may be of any form, but, as here shown, consists of a casing containing upper and lower headers connected by vertical water tubes. Flue tubes located above the burner extend through the water tubes and headers. Fig. 10 shows the lower part of a radiator adapted for use with steam. The water-heater is omitted and the cover attached to the lower plate *c* is enlarged to accommodate a longitudinal flue in which is fitted a gas burner. The lower chamber only contains water so that the tubes *a* are filled with steam.

6202. Mennesson, G. March 14.

Heating buildings &c.; heating by steam circulation.—Relates to systems where steam which is generated automatically and intermittently is employed, as, for instance, in heating buildings. Feedwater is supplied by gravity through a valve which opens when the steam pressure is sufficiently reduced. In addition, the water of condensation is driven from the system into the feed-tank on the steam pressure being sufficiently great. Fig. 1 shows a complete arrangement for heating buildings where radiators are employed, Fig. 2 showing a modification of the boiler and stove that may be



used. Feed from the tank *c* or c^1 enters the vaporizing-coil *a* which encircles the fuel magazine *b*, by way of the non-return valve *g*. Condensation water from the radiators is returned to the cistern *c* or c^1 through return pipes *f*. In Fig. 2, a safety-valve *m* and steam escape-pipe *k* are shown. Auxiliary non-return valves may be placed at *h* in the water return conduits. Other forms of boilers heated by suitable means may be employed.

6316. Gale, F. A. Oct. 12, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

Heating water.—The steam surface apparatus shown in Fig. 1 is specially designed for the heating of water to be used in the washing or charging of steam boilers. Steam is admitted to the chamber a^1 of the tubular surface apparatus A through which the water to be heated is passed and the water from the condensed steam is withdrawn from the chamber *a*. Fresh steam only enters the apparatus on the withdrawal of the water of condensation caused by the withdrawal of the hot water from the heater and the entry of cold water. By means of the governing-apparatus shown in section in Fig. 2, the action of the supply-pump C

and of the pump F, which withdraws the condensed steam, is controlled. As the water is withdrawn from the heater, the pressure in the governing-apparatus is correspondingly varied and the steam allowed to enter the respective pumps by the raising of the lift-valves m^2, m^3 of the apparatus which is attached to each of the pumps as shown at M and M^3. The water pressure bears

FIG.1.

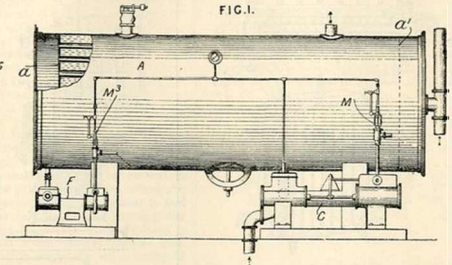
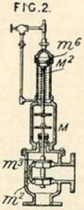


FIG.2.



upon the upper side of the piston m^6 against the pressure of the spring M^2 below, the piston being connected with the steam valves m^2, m^3. Other suitable types of governing-apparatus may be employed. By the above-described arrangements, the supply of water and steam to the heating-apparatus is automatically controlled by the withdrawal of water.

6548. Brooke, R. G. March 17.

FIG.7.

FIG.3.

FIG.1.

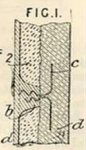


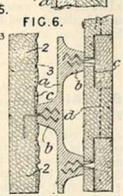
FIG.2.

FIG.4.

FIG.5.

FIG.8.

FIG.6.



Non-conducting coverings.—Relates to devices for attaching fire-resisting or non conducting materials, or both, to the metal walls of water-tube boiler and other furnaces. In the method shown in Fig. 1, wires *c* are cast in bosses on the furnace plate *a*, and the fire-resisting material *d* is spread, while plastic, upon the non-conducting material 2, and is secured by bending over the wires. Fig. 2 shows an arrangement in which are used screws *e* with split ends e^1, the ferrules *f* serving as distance-pieces. Fig. 3 shows a flanged pin c^3 secured by upsetting its end, and Figs. 4 and 5 show similar flanged studs secured by nuts *h*. The ends of the pins or studs are bent over or are split or are fitted with flanged heads c^3 which are embedded in the materials. Fig. 6 shows an arrangement in which the plate *a* is formed with bosses *b* on both the sides so as to secure on one side a non-conducting layer 2 and on the other side a fire-resisting layer *d*, which is formed by embedding a plate or sheet of openwork material in

FIG.10.

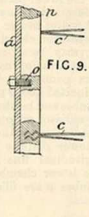


FIG.12.

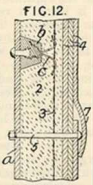


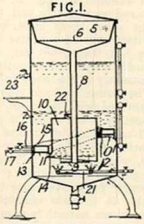
FIG.13.

the fire-resisting material. The aperture for the passage of the wires *c* are filled up with fireclay. The layer 2 is spread upon and forced through the sheet or plate 3, which is secured by some of the wires *c*. The bosses b^1, Figs. 7 and 8, for carrying the wires or studs *c* are secured by set-screws *j* or studs *k*, or the wires *c*, Fig. 9, are cast in strips *n* attached to the wall *a* by studs *o*. Fig. 10 shows an arrangement in which the non-conducting layer 2 is spread upon the plate *a*, covering the bosses *b*. An openwork sheet 3 is then secured upon it by the wires *c*, and a fire-resisting layer *d* is spread upon it, and is thus secured. In a similar arrangement, the wire netting 3, Fig. 12, is embedded in the non-conducting layer 2, which is covered with sheets 4 of asbestos millboard. The heads of the bolts 5 are protected by the edges 7 of the sheets 4. Fig. 13 shows a similar arrangement, the sheet 3 being secured by the hook bolts c^4.

6554. McClelland, D. H., and **Risk, F.** March 17.

Heating liquids.—In the purification of oils, the oil rises from the lip 14 of the bell 10 and passes along the corrugated under surface 11 of the annular heating-chamber 15. This is provided with side extensions 12, 13, beneath the level of the under surface, and with pipes 16, 17, attached one on each side of an internal partition, for the supply and discharge of steam, air, or other heating-medium.

FIG. 1.



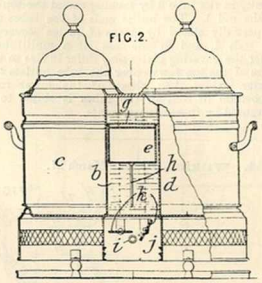
6648. Snow, H. Ackland-. March 18.

Heating water.—A combined urn and apparatus for boiling water and cooking eggs &c. is divided into compartments *c*, *d*, for tea and coffee respectively, and a central compartment *b*, for boiling water, in which is situated a chamber *e* with steam inlet *g* and water outlet *h*. The apparatus is heated by bunsen burners *i*, below which are placed one or more ovens *j* with radiating plates *k* for grilling. The Provisional Specification states that the products of combustion pass upwards into spaces around the compartments.

(*For Figure see next column.*)

6648.

FIG. 2.



6740. Scott, J. March 19.

FIG. 1.

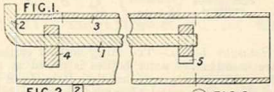
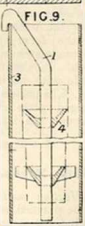


FIG. 2.

FIG. 9.



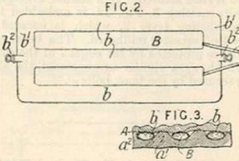
Heating gases.—Consists in rendering more uniform the flow of gases through the fire-tubes of multitubular steam generators and the tubes of mechanical draught air-heaters, in order to effect a regular transverse distribution of the heat, by the insertion of devices into the tubes which are adapted to reduce progressively the cross-sectional area of the passages from the inlet to the outlet extremities. The device shown in Figs. 1 and 2, which is especially suitable for steam generators, consists of a rod 1 provided with a series of discs or the like 4 of constantly-increasing size, some or all of which rest eccentrically within the tube 3 on projecting legs 5. The discs are kept in position by forming the rod with an upturned end 2. A tapered tube closed at its ends, on a tapered rod, may replace the above device. Fig. 9 shows the most suitable arrangement for use in the vertical tubes of a mechanical-draught air-heater. The discs 4 are tapered in the same or in opposite

directions, and the device is supported concentrically in the tube 3 by turning round the top end of the rod 1. The outlet ends of the tubes may be partially closed by means of plates secured to the rods 1, and in the case of a multitubular boiler the covering plates may differ in size so that those of the top rows cover the tube outlets to a greater extent than those of the lower rows. Deposition of soot in the tubes is stated to be prevented by these arrangements.

6844. Wilkins, F. R. March 21.

Hot-water bottles.—The filling-neck of earthenware or other hot-water bottles is placed at the side, and serves also as a handle. It is closed by a washer and a metal plate made to screw down over the washer. The filling-nozzle b^1, according to the form shown in Fig. 1, is made with bayonet-catch notches b^3 on the inside of the neck. In the form shown in Fig. 3, the neck is made with an internal ledge b^2. The washer c, Fig. 5, is pressed against the sunken rim b^2 by the flanged plate c^1. The screwed bolt d passing through the latter is provided at its lower end either with arms e, Fig. 7, or with a plain disc, according as the first or second form of nozzle is used. A washer may be provided, if desired. In a third modification, two or three external bent arms h^1, h^2, Fig. 12, are attached to the screw bolt, and clip the outside ledge of the nozzle. The details of the screw bolt, plates, arms, and washers may be varied.

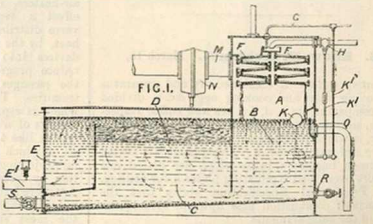
6890. Schmied, A. G. March 22.



Bed-warmers; heating-apparatus.—A mattress or cushion A, Fig. 3, is formed in two parts, joined at one side and buttoned together round the other three sides, to allow of insertion or withdrawal of a heater B, Figs. 2 and 3, heated by hot water, hot air, steam, or other suitable medium, fed either continuously by pipes or intermittently to the heater through the openings at b^2. The lower part of the mattress or cushion is provided with ridges a^1, a^2 to keep the heater in position. The separate parts b of the heater are all connected by similar tubes b^1 at the top and bottom. The heater may be formed of aluminium, or, when required to be bent or curved at various angles, of india-rubber; it may have a flexible loop b^3 for convenience in handling, and is applicable to invalids' chairs, beds, carriages, sleighs, &c. where warmth is required.

6946. Erith, C. March 22.

Heating water. — Water to be purified, softened, and heated, for steam boilers or industrial use, enters the heater A through the pipe H. The water, as it passes down the inclined trays F in thin streams, is mixed with a reagent such as sodium carbonate, admitted by the pipe G, and heated by steam from the pipe M. Carbon dioxide is driven off, and the carbonates of lime and magnesia become insoluble and settle with other impurities at the bottom of the tank B and of the tank C. The water rises up through a filter D fixed in the tank C, and overflows into a storage tank E



provided with an outlet E¹. The inflow of water and reagent by the pipes H, G is regulated by a rod K actuated by a float K, placed either in the tank B or in a separate float box. The sediment is flushed out of the bottom of the tanks by means of the valves R, S. Scum is removed from the surface in the tank B by a skimmer Q. If exhaust steam is used, an oil separator N is placed in the pipe M. The filter D is arranged so that the filtering-material can be easily cleaned or removed.

6991. Brooks, J. B., and **Holt, J.** March 23.

Hot-water bottles.—India-rubber or other hot-water bottles are made with elongated or oval necks and are provided with correspondingly-shaped valve stoppers. The neck *a*, Fig. 2, and the oval frame *b* of the valve have one or more corrugations *i*, so that the two can be firmly united by binding-wire. The top-plate b^1 has the water holes b^2 and a headed screw *f* attached to the movable plate *c*, which is preferably faced with rubber *d*. On turning the screw, the lower plate moves upwards and closes the holes. Pins *h* fitting into gaps h^1 in the blocks *c* are provided to steady the upward movement. Alternatively, the valve may be raised by a cam-ended or eccentrically-pivoted lever, and closing-springs may be placed underneath the valve-block.

FIG.2.

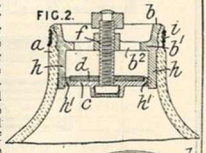


FIG.6A

7007. Winterflood, J., and **Ewart & Son.** March 23.

Heating water.—A water-heater, consisting of a casing in which a boiler is mounted above a gas burner, is provided with means whereby the gas supply is controlled by the water-outlet valve. Within a cylindrical casing 1, the upper part of which forms a water tank 6 and the lower part an annular water space, is concentrically arranged a second double-walled water space 3. The space 3 communicates with the water tank 6 and with the lower annular water space by pipes 8. Placed concentrically within the water space 3 is a double cylindrical tube 4, having its outer wall brought out to meet the inner wall of the casing 1, and its inner wall carried up to form a flue through the water tank 6. A gas heating-device 9 is located in the lower part of the casing 1, so that the products of combustion may pass, as shown, around both sides of the water space 3. The water tank 6 is provided with a ball inlet valve, from which a pipe 10 leads to the annular space of the casing 1. Fig. 1, shows one arrangement by which the water-outlet

FIG.1.

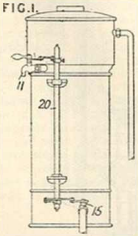
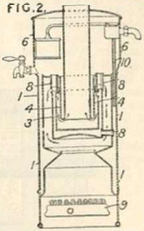


FIG.2.

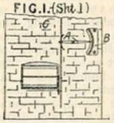


valve 11 controls the gas-supply valve 15. The plugs of the valves are provided with levers, which are connected by links to arms at opposite ends of a pivoted rod 20.

7081. Thornhill, C. J., and **King, H. J. H.** March 24.

Thermostats.—The controlling rod C of the thermostat for the regulation of temperature in malt and hop kilns, stoves, ovens, buildings, &c., as described in Specifications No. 13,006, A.D. 1885, and No. 29,546, A.D. 1896, is attached to one end of a pointer A, which serves to indicate the temperature, or may be arranged to record it on a rotating drum.

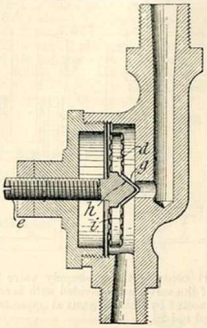
FIG.1.(Sht.1)



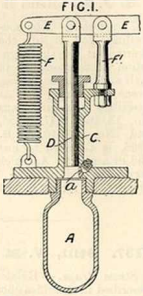
7137. Still, W. M. March 24.

Steam traps.—Relates to traps of the kind described in Specifications Nos. 21,571 and 25,858, A.D. 1902, means being provided for preventing the hollow valve *g*, and the diaphragm *i*, from being damaged when the valve is forced against its seat by the spindle *e*, and also for supporting the fluid-containing chamber *d* upon the spindle *e*. A projection *h*, corresponding to the internal surface of the valve *g*, is formed in the side of the chamber *d*, and the spindle *e* is made to fit into this projection, so that, when the spindle is screwed in too far, it simply presses against the seat of the valve. The outer part of the projection *h* is enlarged in diameter, and is made cylindrical. The end of the spindle is correspondingly shaped.

(*For Figure see next page.*)



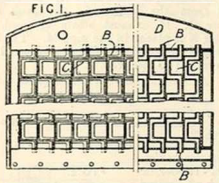
7276. Kershaw, H. B. March 26.

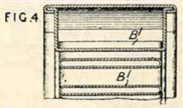


Thermostats applicable to steam and hot-water boilers or heaters, heating and cooling apparatus, radiators, calorifiers, hot-water pumps, &c. A hollow vessel A, containing an expansible liquid, communicates with a cylinder C, within which is arranged a ram or piston D connected by a lever E with the valve or damper. The vessel A, which is filled through an opening *a*, is placed within the boiler, cistern, &c., the temperature in which is to be kept constant. The lever E, which is pivoted to a fulcrum F1, is returned to its normal position by a spring F or weights.

7487. Livingston, D. M. Feb. 11, [*date applied for under Patents Act, A.D. 1901*].

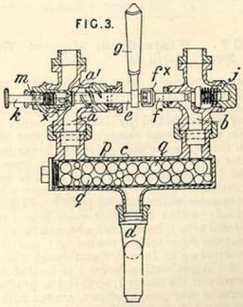
Heating-apparatus. — Relates to surface apparatus applicable for cooling, condensing, and heating in general, and as a cooler for the explosion engines of motor vehicles in particular. The fluid to be cooled is led into a chamber D, Fig. 1, at the top of the apparatus, and thence downwards through sinuous conduits B, formed by plates having rectangular corrugations of larger and smaller size alternately. These conduits are arranged with the corrugations in one bridging





those in the adjacent conduits, thus forming spaces C through which the cooling-medium circulates in a direction at right-angles to that of the fluid to be cooled. Two modifications are described. In one, the conduits B are formed by flattened tubes B1, Fig. 4, while, in the other, one of the plates of each conduct is provided with corrugations of uniform width.

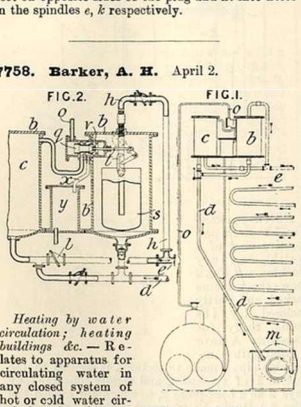
7757. Leach, E., [*trading as* Sandiford, T.], and **Brierley, I. H.** April 2.



Heating water.—Cold water admitted through a

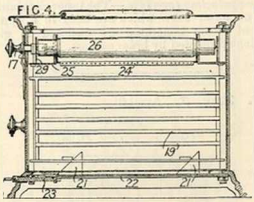
valve a to a chamber c is heated by direct contact with steam which enters through a valve b. A pipe d conveys the heated water to the bath or other place where it is required. Glass or other marbles q may be fitted between perforated plates p in the chamber c. The valves a, b are opened together by a handle g, their spindles e, f being connected together by a box coupling $f^{\times}$, which allows the valve a to open slightly before its spindle e presses against, and operates, the spindle f. A spring j closes the valve b when the handle g is moved back to the closed position. The inlet apertures of the valve a can be regulated by a screwed spindle k. Removal of the plug a^1 of the valve a is facilitated, when the outer part of the casing is unscrewed, by the spindles m, which project on opposite sides of the plug and fit into holes in the spindles e, k respectively.

7758. Barker, A. H. April 2.



Heating by water circulation; heating buildings &c. — Relates to apparatus for circulating water in any closed system of hot or cold water circulating-pipes by means of steam or air pressure. Two closed tanks b, c placed at or near the highest part of the system, are connected through non-return valves to the main flow pipe e and main return pipe d, so that the contents of each are alternately discharged into the circulating-pipes. A heater or cooler m may be arranged as shown in Fig. 1. Steam or compressed air is supplied from a boiler or other source through a pipe o to the tanks b, c. Fig. 2 shows, on an enlarged scale, the means for alternately filling and discharging the tanks. Within one tank is arranged a bucket s which actuates a valve q. The valve q controls the inlet of steam or air to the tanks and the outlet from each tank to the exhaust pipe x. As shown in Fig. 2, steam or air is passing through the openings v into the tank b forcing any water in the bucket through the pipe h, which is fitted with a non-return valve, to the main flow pipe e. Water is prevented from flowing from the main return pipe d past a non-return valve to the tank b by the steam pressure in the tank. The water in the main return pipe d is flowing past a non-return valve into the tank c, which is open to the exhaust but closed to the steam inlet. When the bucket is empty, it rises and actuates the valve q through a tumbling-lever mechanism t so as to shut off the steam or air supply to the tank b and to admit steam or air to the other tank. The tank b is now open to the exhaust, while the water in the tank c is forced out past a non-return valve l to the main flow pipe e. Water now enters the tank b and eventually flows into the bucket s, causing it to sink and move the valve q to its original position. Where steam pressure is employed, the exhaust may be passed through a condenser or feedwater heater y, the resulting hot water being supplied to the boiler or water heater.

7814. Bauer, C., [*Dutertre, G. E.*, and *Nodet M. F. A.*]. April 2.



Heating by electricity.— Tubular incandescent lamps such as are described in Specification No. 14,309, A.D. 1903, are used in ovens for roasting, in apparatus for heating saucepans, grilling, or baking, and in footwarmers and bedwarmers. Each tube may contain a drop of mercury, the vapour of which emits heat while the filament gives less radiation. Fig. 4 shows an oven, in which several lamps 26 are supported horizontally between spring contacts 29 in ventilated angle-irons 25. A half-cylindrical reflector 24 can be turned round each lamp by engagement with projections on a knob 17 to direct the radiation downward, for roasting meat in the oven, or upwards, for heating things placed upon the top of the oven. A perforated channel along the middle of each reflector permits of passage of steam. A frame 19, for supporting dishes, is adjustable vertically in the oven by wedges 21 on a plate 22, movable by a screw 23. The oven may be surrounded by packing to reduce loss of heat. Another form of oven for roasting consists of a box with a loose cover which carries a vertical rod on which meat is spitted; four lamps are placed vertically in front of reflectors at the corners of the box. A heater to be placed under or over a dish, grill, or saucepan consists of a round or rectangular flat box, containing several parallel

lamps, and provided with handles and flexible connections to a coupling-plug. Two such boxes of lamps may be placed horizontally or vertically, and used for roasting meat or coffee, or cooking eggs.

Footwarmers.—A box containing an incandescent lamp is provided with a hinged cover, which closes the circuit when pressed down on spring contacts.

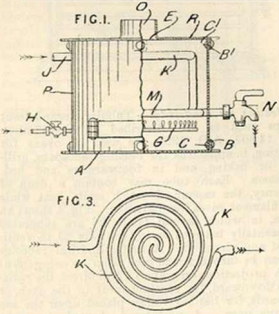
Bed-warmers.—A three-sided prismatic case contains one lamp ; one side is blackened inside and the others are reflective. A separate time-switch is provided to open the circuit automatically after a regulated time.

Heating water.—A rheostat for regulating the supply of current to the heaters described above has wire resistances placed in sand in glass tubes, which are immersed in water and serve to heat this.

7846. Pinckney, P. April 5. *Drawings to Specification.*

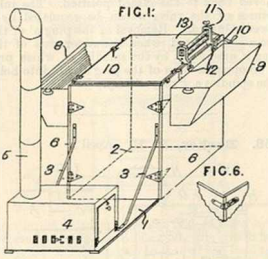
Non-conducting coverings.—The inner circulating-tubes of water tubes which are used in a special form of steam generator are enclosed in glass coverings protected by brass casings.

7987. Key, J. April 6

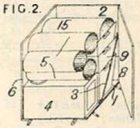


Heating water.—A water-heater for domestic baths &c. burning gas, or liquid or other fuel, consists of two superimposed double spirals of the form shown in Fig. 3, which may be flat or coned either upwardly or downwardly. Cold water enters at J and from the spiral M the pipe is led outside the shell to the cut-off tap N. The cylindrical shell P is connected to the bottom A and the top R of the apparatus by bolts, rivets, or other attachments C, C^1, passing through the tongues B, B^1, formed by incuts made in the bottom and top. One or more annular burners G are placed above the base-plate, and, to provide for the escape of the gases, a fume hole E is cut in the top of the plate and is surrounded by a collar O.

8020. Roberson, W. A. Sept. 1, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

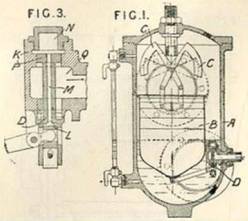


Boiling-pans.—Fig. 1 shows a perspective view of a portable laundry machine, and Fig. 2 shows the machine packed, and partly enclosed by its casing, ready for transport. A stove 4, fitted with a removable pipe 5 made in sections, is secured to the bottom 1 of the casing and rigidly connected by stays 3 to a back-piece 2, to which are hinged the sides 6. Hooks 10 of metal washing and rinsing tubs 8, 9 respectively, and also clamps 12 of a wringer 11, engage with the top of the sides 6, which are braced by a board 13 hooked on to the sides and notched to receive the hooks 10 and clasps 12. The board 13 serves as an ironing-board, or as a support for a rectangular tray which covers the top of the casing when closed, and other articles, the tray serving as a receptacle for clothes when the machine is in use. To pack the machine, the pipe 5 is disconnected, and, together with a boiler 15, packed into the casing as shown in Fig. 2, the sides 6 being swung round to engage with the bottom 1, which is closed in front by the board 13 and at the top by the rectangular clothes-tray. The various parts of the casing are fastened by ordinary hook-and-staple fastenings shown in Fig. 6.



8171. Foley, N. Oct. 16, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

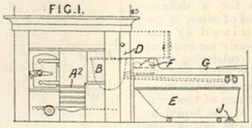
FIG.3. FIG.1.



Steam traps.—The receptacle A is fitted with a discharge valve D, operated by a float B, which is also suspended by counter-weighted levers C. The valve D consists, Fig. 3, of a piston mounted in a casing K and with an axial passage M leading to a chamber N, and with its lower end closed by a small conical valve L mounted with a small longitudinal play on the main valve. The opening leading from the chamber N to the outlet Q is closed by a piston P. The first effect of the rise of the float B is to open the valve L and thus to admit pressure to the chamber N to act on the piston P and to balance the main valve. Further motion of the float opens the main valve, and discharges the vessel A.

8190. Hodkin, H. H. April 9.

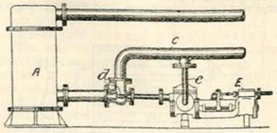
FIG.1.



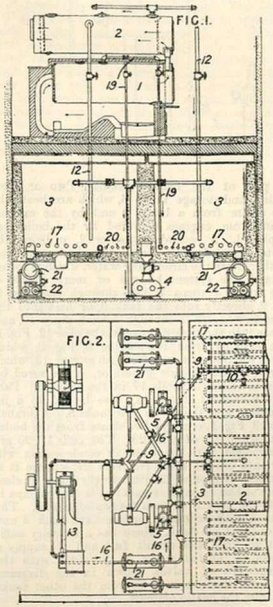
Boiling pans.—A bath E of the type described in Specification No. 12,296, A.D. 1901, is supplied with hot water from a boiling pan B heated by a flue passing beneath it, or by moving the grate A^2 bodily by means of a rack and pinion. Access is had to the boiler by a door hinged at the back.

8733. Kershaw, H. B. April 16.

Heating buildings; heating by water circulation.—To accelerate the circulation in a hot water system, part of the returning water is drawn off through a relatively small pipe *e* and forced by a pump E of any ordinary construction through the nozzle *d* of an injector, preferably placed near the boiler A. The injector forms a bye-pass from the main return pipe C.

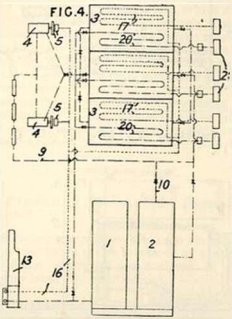


8883. Justice, P. M., [*Peck, C. C.*]. April 18.



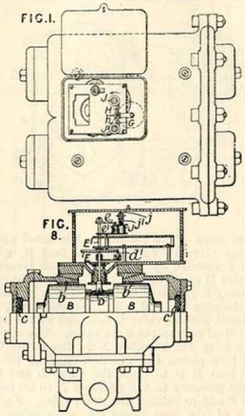
Heating buildings; heating water.—Relates to a system of heating by a mechanically-forced circulation of hot water, primarily, for heating a district

of buildings from one or more central stations. Fig. 1 shows a part of the apparatus in vertical section, Fig. 2 a plan view of part of a boiler-room and of an engine-room, and Fig. 4 a diagram

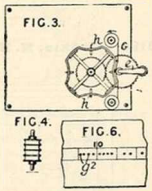


of part of the heating-circuit. Two or more heating and storage tanks 3, which are heated by live steam from a boiler 1 and by the exhaust steam from engines operated by the boiler are employed. A secondary heater 2, utilizing the waste heat of gases from the boiler furnace, further heats the circulating-water, which is forced through the system by one or more pumps 4. The water returns either through the pipe 9, Fig. 2, directly into the tank 3, or first into the secondary heater 2 through branch pipes 10, and thence into the tank 3 through the pipe 12, Fig. 1. The exhaust from the engine 5, Fig. 2, which drives the pumps 4, and from an engine 13, which may drive an electric generator, is delivered by pipes 16 to heating-coils 17 in the tanks 3. Part of the exhaust steam may also be led to a jet condenser and thence to the tanks 3. A branch pipe 19, Fig. 1, conveys live steam from the boiler to a second set of coils 20. The coils 17, 20 are so arranged that the water of condensation will flow into one or more receivers 21, whence it is returned by pumps 22 either to the boiler or elsewhere. The exhaust steam from the pumps is led to the tank 3 or to a feedwater heater. The pump 4 may be placed between the tank 3 and heater 2. Each tank, which has a capacity sufficient to keep the circuit full and to supply a reserve of heated water, is provided with the arrangement of valves shown in the diagram, Fig. 4, for disconnecting it from the other tanks and from the heating-circuit.

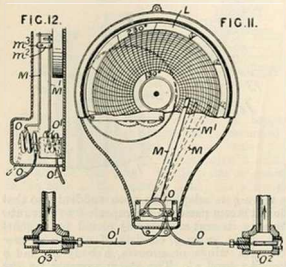
8883A. Justice, P. M., [*Peck, C. C.*]. April 18.



Heating buildings &c.—The amount of heat supplied from hot water circulated through radiating-devices for a definite period of time, is determined by continuously measuring and registering the flow of liquid, and determining the average difference of temperature of the liquid at inlet and outlet; the total weight of liquid, which has passed during the time, is multiplied by the difference of temperature. A continuously-recording water meter may be placed at the inlet or outlet, and recording thermometers arranged at both the inlet and outlet. Water meters may be arranged at both ends, so that the difference in their records, due to the contraction of the liquid, gives a measure of the fall in temperature. A recording thermometer gives the initial temperature to enable the weight of the liquid passing to be calculated. A meter and a thermometer may be arranged at the inlet or outlet, and thermostats arranged at both ends. These thermostats operate valves in waste pipes connected to either the supply or the return circuit. A meter is arranged in each waste pipe. Each thermostat may operate



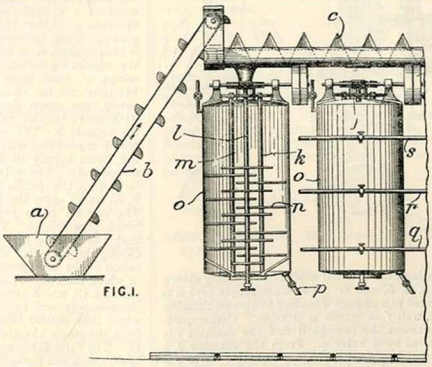
an electric switch, so as to vary an electric current from which a measure of the temperature is obtained. Figs. 1 and 8 show recording-mechanism



operated by a Worthington meter. The plungers B are fitted in rings *b* and strike against elastic buffers *c* at the ends. A lever D, operated by these plungers, actuates, through ratchet gearing d^1, E, a shaft E^1 carrying two arms *e* supporting a vertical grooved roller e^1. This roller, at each revolution, presses a paper ribbon G against a metal point *h* in a plate H. The ribbon passes from a roller J^1 to a roller J driven by clockwork, and is kept tight by a spring j^1 adjusted by a nut *j*. The amount of water flowing is determined from the number of perforations g^2, Fig. 6, on the face of the ribbon. Fig. 3 shows a modified form of recording-apparatus in which a plate, carrying four points *h*, arranged at different heights, is operated by the gearing shown, and a roller with four grooves, as shown in Fig. 4, is used. Figs. 11 and 12 show recording thermometers in which marker-arms M, M^1, moving in front of a chart L rotated by clockwork mechanism, are operated by helical, flattened, metal tubes O, O^1 connected to thermometer bulbs o^2, o^2 preferably containing alcohol. The coils O, O^1 may be arranged with their coils in opposite directi s, and the marker-arms M, M^1 bound togeth nby a sleeve m^2 and a bolt m^3, so that a record of the differences of temperature is obtained. When the recording-apparatus of the water meter and thermometers is combined, so that both records are obtained on one strip, the strip passes over an additional idler guide-roller, so that the meter and thermometer markers can act on two parts of the strip at right-angles to one another.

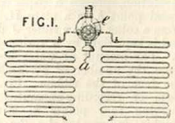
9018. Meerdervoort, H. J. A. P. van. April 19.

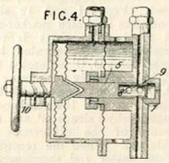
Digesters.—Sterilized oils and guano are obtained by digesting fish under a pressure of about three and a half atmospheres. Fig. 1 shows a side elevation of the apparatus for extracting oil. The material placed in the receptacle *a* is carried by the elevator *b* to the screw conveyer *c*, which has screw threads provided with breaking or pulping arms. The digesters *o* contain stirrers *k*, *l*, *m* having horizontal arms *n*. Steam is supplied through the pipe *p*. The oil is drawn off through the pipes *q*, *r*, *s*, and the residue is removed by trollies to the guano apparatus.

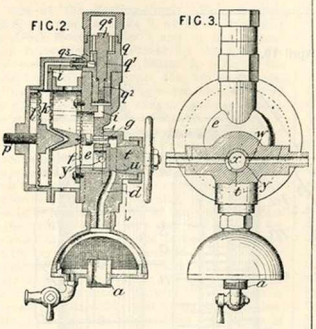


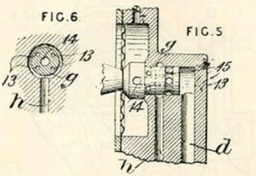
9209. Still, W. M., and **Adamson, A. G.** April 21.

Heating by steam circulation; heating buildings; thermostats &c.—In steam heating-apparatus applicable to railway vehicles, ships, hotels, private houses, conservatories, &c., the steam-admission valve of each radiator is open except when the temperature or pressure in the radiator is sufficient to cause the opening of a bye-pass valve controlling the access of steam to a device which, when acted upon by steam, closes the steam-admission valve of the radiator. When the valve-closing device has resumed its normal condition, the admission valve is again opened. Fig. 1 shows diagrammatically the heating-system. Figs. 2 and 3 show the regulating-device, detail modifications being shown in Figs. 4, 5, and 6. The steam-supply pipe *a* is connected to a passage *d* leading to a steam chamber *e*, one wall *f* of which is flexible. Communication between the passage *d* and the chamber *e* is controlled by a valve *g*. From the chamber *e*, a bye-pass passage *i*, in which a weighted valve *q* is arranged, leads to a thermostatic device, such as that described in Specification No. 21,571, A.D. 1902, or a second steam chamber *l* containing a capsule *k* charged with an expansible fluid. The adjacent flexible walls of the chambers *l*, *e* are connected by a block of vulcanized fibre or the like. The outer wall of the chamber *l* receives the conical head of an adjusting-screw *p*.



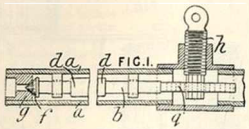






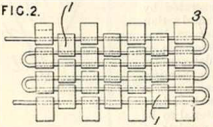
The valve *q* is adapted to open suddenly, so that sufficient steam passes to the capsule *k* to force the valve *g* on its seat and keep it closed for a short period. The valve *q* consists of a stem q^2 provided with wings or grooves, a body q^1, and a piston-like head q^3. The steam pressure on the underside of the body q^1 raises the valve until a port q^3, leading to the capsule *k*, is uncovered. The radiators may be arranged in sections, and the steam supply to any or all of the sections shut off by means of the stop-cock *t*. The cock plug, which is adapted to turn through about a quarter of a revolution, is formed with an external groove *u*, which permits the passage of steam except when the plug is in one extreme position. The inner hollow end of the plug is provided with oppositely-arranged apertures *x*, *y*, which open to corresponding passages *v*, *w* leading to the radiators. The aperture *x* extends over a larger arc than the aperture *y*, so that the port *w* is closed before the port *v*. When both ports are closed, the groove *u* is also blocked, so as to cut off the steam supply to the regulating-device. In order to prevent the escape of steam from the radiators through the bye-pass and the chamber *l* when the valve *g* is closed, the steam chamber *e* may be dispensed with, and a tubular valve 5, Fig. 4, connected to the capsule *k*. The valve 5, which has an inlet port 7, is provided with outlet ports 8, 9 regulating the steam supply to the radiators and bye-pass respectively. The valve is moved longitudinally on turning the spindle 10, attached to the capsule *k*, so as to close the ports 8, 9 simultaneously. The spindle 10 is provided with grooves with which pins engage. The grooves are formed so that the spindle may be partly turned without closing the valve 5. Figs. 5 and 6 show a modification of the arrangement shown in Figs. 2 and 3, in which the body of the valve *g* is formed with passages 13, which extend longitudinally from the steam-supply end to near the head of the valve, where they extend laterally. A passage 14 leads from the steam chamber *e* to an external groove 15. The valve is shown as being closed, but, when open, steam can pass through the passages 13 into the chamber *e* and thence through the passage 14, the groove 15, and passage *h* to the radiators. A strainer or filter *l*, Fig. 2, of wire gauze may be fitted over the inlet end of the pipe *a*.

9302. Bidee, J. B. E. April 22.



Steam traps.—A bar *d* or tube of copper or other metal of high expansion is mounted in a tube *a* of cast iron, and a conical valve *f*, fixed to one end of the bar, coacts with a seat *g* in the end of the tube. While water is contained in the tube *a*, the valve is open, but when steam is admitted, the copper bar expands more than the cast-iron tube and closes the valve. The position of the bar *d* is adjusted by a screw *h*, the lower end of which is in the form of a pinion and gears with a rack *q* on the end of the bar. As the screw is at right-angles to the bar, its expansion does not affect the position of the bar.

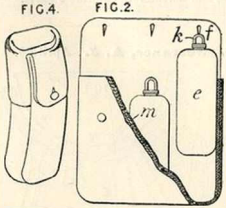
9375. Vedovelli, [*née* Del Castillo], **V. E.** Oct. 19, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].



Heating by electricity.—Resistances applicable for heating consist of german silver, iron, or other resistant wire, threaded through beads 1 of glass, porcelain, or other insulating-material. Each bead may have two or more holes, to receive and hold together adjacent wires, or parts of one wire as shown, so that the wire lies all in one plane or otherwise. A bead with two holes entering an open groove may be placed in each loop 3 of the wire to protect it. The beads may be of any desired form and may entirely cover the wires.

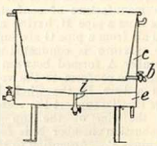
9432. Sampson, R. W. April 25.

Hot-water bottles.—A textile bag or carrier, provided with a lining of sheet asbestos *m* on the side remote from the person, is constructed with pockets adapted to receive the hot-water containers *e*, over which the flap *f* is then secured. The containers are fitted with screw stoppers *k*, and, when cold, may be re-heated without refilling. One or more sections may be removed,



and the carrier wrapped round the remainder if a smaller warmer is required.

9629. Harding, R. E. April 27.



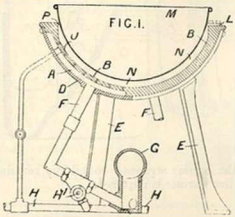
Boiling-pans.—Relates to a steam-heated water-jacketed pan especially adapted for heating milk or whey in making cheese. The pan, which is provided with an outlet *b*, rests in the water jacket *c*. This jacket is preferably made with a double bottom, the space between the two bottoms forming the steam space *e*. The upper bottom slopes to a water outlet *i*. Inlet and outlet pipes are fitted to the water jacket and to the steam space. The steam space may be concentric with the water jacket as well as below it. In the Provisional Specification, it is stated that a steam coil may be formed in the lower portion of the water jacket.

9680. Lake, H. H., [*Jencquel & Hayn*]. April 27.

Non-conducting compositions.—Instead of asbestos, artificial magnesium silicate, prepared from magnesium chloride or other salt, is used in the manufacture of artificial stone &c. Kieselguhr is mixed with organic substances leaving little ash on combustion, such as chaff, cork waste, wood dust, rice hulls, paper, &c., and a little clay, and is then kneaded with the artificial silicate and water-glass, from which silicic acid is produced. The silicate and silicic acid form a cement in the body of the composition, which is afterwards burnt to sintering or till

glazing occurs. The materials used in a composition given consist of kieselguhr 170 parts, clay 40 parts, rough-ground cork 110 parts, water-glass 9 parts, and magnesium chloride 9 parts.

9705. Torrance, A. J. April 28.



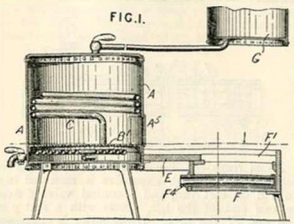
Boiling-pans.—Relates to apparatus using a mixture of gas and air for heating portable boiling-pots, such as those used for boiling sugar and in the manufacture of confectionery and the like. Gas from a pipe H, having a regulating-valve H^1, and air from a pipe G are supplied to pipes F, and the mixture is conducted to the distributing-chamber A formed between a perforated top B, shaped to conform to the vessel M to be heated, and a base D, the whole being mounted upon legs E. To support the vessel M, lugs L are fitted on the rim of the top B so that a narrow combustion chamber N is formed, having exhaust openings P. According to the Provisional Specification, the exhaust may pass through perforations in the rim, or the base of the vessel may be constructed with projections to produce exhaust apertures, or exhaust pipes may be formed to extend through the body of the fuel chamber or through the vessel itself. The distributing-chamber may be divided into three compartments by providing the top B with three radial ribs and forming the base D in three sections fixed to the ribs. An ignition jet J is provided to re-ignite the mixture in the event of extinction when the vessel M is removed.

9817. Allison, C. A., [*Lackovic, M. A.*]. April 29.

Boiling-pans for scalding potatoes. The potatoes are scalded for three or four minutes in boiling water, which is then drawn-off rapidly and replaced by cold water. The potatoes are supported by a perforated partition B^1 in the boiling-vessel A, which has a door A^5 and is connected, as shown, to a water-container G. The water is heated by steam pipes C of the form shown.

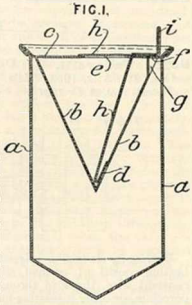
(*For Figure see next column.*)

9817.



9853. Espenhayn, W., and **Hunger, F. O.** April 29.

Heating by chemical action.—Relates to apparatus specially suitable for heating food, liquids, or other substances in a semi-liquid state by means of the heat generated by the chemical action of water on lime or caustic soda or by similar actions. The apparatus, which is adapted to be inserted into the material to be heated, consists of an outer sealed receptacle *a* for the lime, soda, or the like, and an inner sealed receptacle *b* for water or other liquid which acts on it to produce heat. By breaking the seals, the liquid is allowed to run into the outer receptacle. The cover *c* is soldered to the funnel-shaped inner receptacle *b*, and its edge is bent over and soldered to the outer vessel. Two openings are made in the cover—an opening *e* for filling the inner vessel, and an air-hole *f*, communicating with the outer vessel. A strip of tin *h* is soldered over the holes *d* at the apex of the inner vessel, which is then filled with the reacting liquid, and the receptacles are hermetically sealed by soldering the strip over the openings in the cover. The end *i* of the strip may be bent round an ordinary tin-opener key, capable of winding the strip until the holes at the apex of the funnel are uncovered, when the reacting liquid will flow into the outer vessel.



10,065. Mondt, E. May 2.

Steam traps.—A hollow shaft 1 carries a ported rocking arm 3 to which are connected a collecting-vessel 4 and weighted arms 8, 11. The weight of these parts is balanced by a weighted lever 12 carrying a roller 14. Packing is inserted between the shaft 1 and two cylinders carried by

FIG.1.

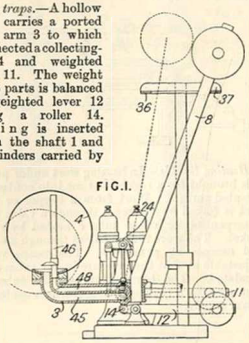
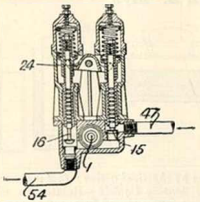


FIG.4.

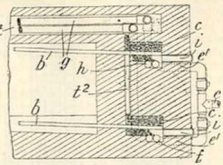


fixed bearing jackets, stuffing-boxes tightened by screws and crossheads being provided at the ends of the shaft. The passage of steam through the drum 4, a pipe 46, a passage 48, and a passage in one end of the shaft 1 to the pipe 54 is controlled by a spring-pressed valve 16. The steam enters the drum through a passage in the other end of the shaft 1 and a passage 45 in the arm 3. The passage of steam from a pipe 47 through the passage 48, and the pipe 46 to the drum, to discharge the water of condensation, is controlled by a spring-pressed valve 15. The valves 15, 16 are operated by a lever 24 connected as shown to the lever 3 the motion of which is limited by stops 36, 37.

10,093. Reese, L. C. May 3.

Heating liquids and gases.—The pipes of a tubulous boiler, steam superheater, or other tubular apparatus are surrounded by blocks of refractory material, among which is burned a mixture of air and coal gas, oil gas, or water, producer, or blast-furnace gas. Fig. 1 shows the invention as applied

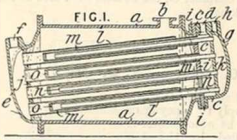
FIG.1.



to heating the Perkin's tubes *b* of an oven or drying-chamber. The burners *f* consist of perforated tubes, to which gas, preferably heated, is supplied by the pipes *e*, *e*¹. Similar tubes *h*, *g* supply air for the combustion of the gas, which air is previously heated in the flue *t*. The fires are lighted through the doorways *i*. The combustion products from the lower chamber *c* pass upwards through the flue *t*² and assist in heating the upper tubes *b*.

10,103. Barker, A. H. May 3.

FIG.1.



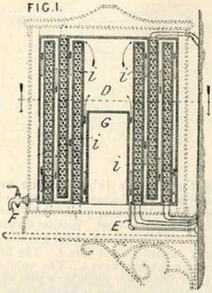
Heating liquids.—Relates to concentric-tube apparatus which is so arranged that thin layers of the heating-agent and the water to be heated flow alongside in opposite directions, the tubes being free to expand or contract. An outer casing *a*, Fig. 1, is fitted with a sleeve piece *c*, and caps *e*, *g*, and tube-plates *j*, *i*, *k*, into which are fastened at one end three series of concentric tubes *l*, *m*, *n*. The tubes *l*, *n* are open at both ends, while the tubes *m* are closed at one extremity by plugs *o*. An inlet *h* and an outlet *d* are provided for the steam or other heating-fluid, and an inlet *b* and an outlet *f* for the water to be heated. The tubes *l* and corresponding plate *j* may be omitted.

10,189. Waterman, E. R. May 3.

Heating liquids.—An electric apparatus for heating liquids consists of a series of annular chambers in a cylindrical casing, a continuous stream of hot liquid being obtained. The

annular chambers contain resistance wires *i*, embedded in asbestos or other non-conductor, while the spaces between them form a continuous passage for the liquid ending in the central

FIG. 1.

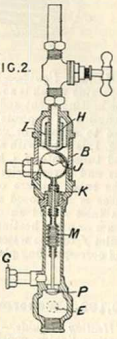


chamber D in the upper part of the casing. An inlet pipe E and an outlet tap F are provided. Below the chamber D, which acts as a hot-water storage chamber when the circuit is broken, is a hot-air chamber G, the bottom of which is formed by packing.

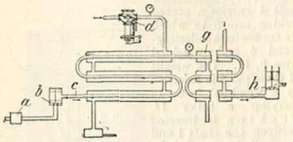
10,260. Fenlon, H. T. May 4.

Heating water. — The gas-supply to a geyser or other like water-heater is controlled by the tap which regulates the water flow. The water-inlet tube H projects into a thimble I, which is movable in the casing B and is depressed by the force of the entering water on to a collapsable ball J, the interior of which communicates by a tube K with a bellows M. Compression of the ball produces an expansion of the bellows, and opens the valve P, allowing the gas to pass from the supply pipe E to the gas inlet G of the geyser. The thimble I may be dispensed with, in which case the water compresses the ball directly. A pilot burner with a separate supply passage may be fitted.

FIG. 2.



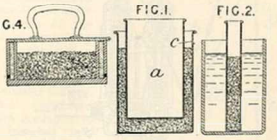
10,361. Aspinall, F. B., and **Cannon, M. J.** May 5.



Heating liquids.—In heating wort under pressure it is brought for a regulated time into contact with a heated surface. Wort from a copper or underback is forced by a pump *a* through a valve *b* into a serpentine or other tube *c* heated by a steam jacket. The wort thence passes through a cooler *g* and escapes by a valve *h*. The escape valve is adjustable so that the pressure in the tubes can be regulated. The temperature of the tubes *c* is regulated by a reducing-valve *d* which controls the steam supply.

10,379. Partl, L., Károlyi, G., and **Paatz, E.** May 5.

FIG. 4. FIG. 1. FIG. 2.



Heating by chemical action; foot-warmers; hand-warmers; heating liquids.—Relates to means for generating heat by the addition of water to burnt lime, to which are added, either separately or in groups, potassium carbonate, magnesium carbonate, sodium phosphate, calcium phosphate, sodium nitrate, and sugar. The heat so generated may be utilized in cooking-stoves, for heating preserved foods, drinks, water for washing, flat-irons, foot and hand warmers for vehicles, and so forth. The apparatus employed for cooking food is shown in Fig. 1. The substance for generating the heat is contained within a vessel *c*, and surrounds the cooking-vessel *a*. For heating beverages, the means adopted are shown in Fig. 2. Water for baths may be heated by immersing within it a vessel containing the heating-medium, and provided with a valve for the escape of vapour generated within the vessel. Fig. 4 shows a flat-iron heated by the medium, which transmits heat to the bottom of the iron, the sides of which are insulated.

10,452. Eden, E. M. May 6.

FIG.1.

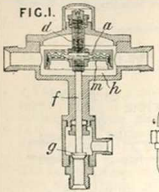
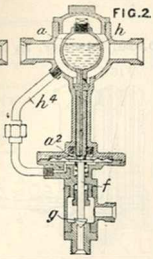


FIG.2.



Thermostats.—A thermostat acted upon by superheated steam from a superheater or a flash or semi-flash boiler is adapted to regulate the amount of superheating by controlling a valve, which may, for instance, govern the supply of liquid fuel to the furnace, or the supply of feedwater to the generator, or may determine the admission of water to the superheater, or divert the feed back to the feed-tanks. A flexible chamber *a* partly filled with water is enclosed in a protecting-casing *m*, the whole being supported by a screw *d* in a chamber *h* which is in direct communication with the steam pipe. The other wall of the chamber carries a rod *f* which actuates a valve *g* when the pressure within the chamber *a* sufficiently exceeds the pressure exerted on it by the external steam, which, since the latter is superheated, will be normally less than that of the saturated steam within the chamber. The valve may control the feed or fuel supply as above stated. In a modification, Fig. 2, the chamber *a* is non-expansible, but communicates with such a chamber a^2 on the outside of which the boiler steam pressure is maintained through a connecting-tube h^4. The valve may be loaded by a spring *l* if desired. Liquids other than water may be employed in the expansible vessel to control the valve.

10,519. Lonsdale, T. May 7.

FIG.1

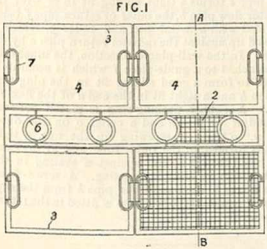
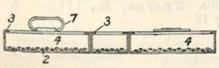


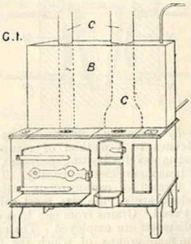
FIG.2.



Non-conducting coverings. The covers of economizers for steam boilers, steam superheaters, and the like consist of a series of metal trays which have grid-like bottoms 2, and flanged upper edges 3 for retaining the covering-material 4. Some of the trays are formed, where necessary, with apertures 6 for the passage of chains. The trays may be separately removed by the handles 7, or by other suitable means.

10,533. Bailey, G. May 7.

FIG.1.

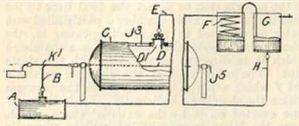


Heating water.—The water in a boiler B is heated by the waste gases from a kitchen range or gas stove in their passage through flues C which traverse the boiler. If flues are already fitted to the stove, channels are formed in the boiler, which partly surround them when the heater is in place.

10,664. Ewen, M. F., and **Tomlinson, G. H.** May 9.

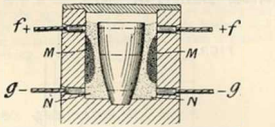
Digesters.—Wood cellulose is converted into sugar by means of sulphurous acids in suitable apparatus (shown diagrammatically). The digester C is charged with sawdust through the manhole D^1,

and the tank A supplied with sulphurous-acid solution. The tank A is heated and its contents driven over into the digester through the pipe B and perforated pipe D. The temperature is then



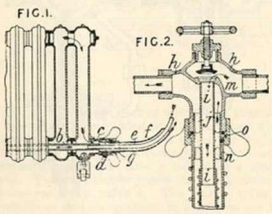
raised to 120°–160° C by steam, entering the jacket J^3 through the pipe J^5. The conversion is facilitated by pumping in air, oxygen, or ozone through the pipe K^1, and thus producing sulphur trioxide. When the operation is complete, the gas is blown off through the pipe E and condensed in the worm F, the liquid discharged into the tank G, where further sulphurous acid may be added, and returned by the pipe H to the tank A.

10,873. Voelker, A. May 11.



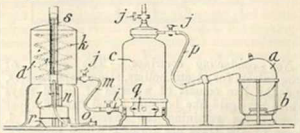
Heating by electricity; non-conducting compositions. — Relates to a method of manufacturing electric resistances for heating purposes, and to a method of heating articles electrically. The resistances are formed of carbonaceous material, the grains of which are of the size most suitable for the current used. Grains from one to seven millimetres in diameter are employed. The material is divided into main groups, of which the first consists, for example, only of grains of one millimetre diameter, the second of grains of two millimetres diameter, and so on. Each of these groups is varied by the addition of substances which increase or diminish the conductivity of the group, such as graphite or silicon compounds. The material is spread over the surface to be heated, the heating being due partly to the resistances of the material and partly to the formation of numerous small arcs. The figure shows an electric furnace applicable to fusing nickel. A crucible is surrounded by a jacket, composed of masses of the kind described above, so graded that the electric current conveyed by the leads *f*, *g*, can only flow through those portions thereof which are in direct contact with the surface of the crucible. The inner layer N, which offers the least resistance, is arranged to impart the most heat to the top and bottom of the crucible. The outer layer M serves mainly as a heat insulator.

10,924. Barker, A. H. May 12.



Heating buildings &c.—The inlet and return passages of a radiator are combined in one double pipe or plug so arranged as to be connected at will by a double flexible pipe with a wall plug on the hot-water flow and return pipes. Figs. 1 and 2 show the connections for a concentric flexible pipe, but it is stated that the pipe or plug may be divided by a longitudinal partition. The inner or flow pipe *e* forms a tight sliding fit in or over the radiator flow pipe *b*, the outer or return pipe *f* being provided with a metal end and collar *g*, which is screwed up against the radiator return pipe *c* by the nut *d*. In the wall-plug connection, the inner tube *i* is attached to a guide-piece *j* which is accurately turned to form a good sliding fit in the plug connection *h* and a tight fit in the end *n* of the flexible pipe. A rubber packing-ring is placed between the end of the pipe *h* and a collar *o* on the outer tube *n*, so that, on screwing up the nut, a tight joint is formed in the outer tube, and at the same time the tube *i* is forced against a seating in the diaphragm *m* in the plug casting. A screw-down valve serves to disconnect the pipe *h* from the supply, and a suitable cock or tap is fitted in the return branch.

10,960. Thorne, E., [*Thorne, K C. M.*]. May 12.

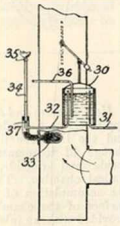


Heating gases.—Gases which are to be inhaled are heated by passing them, after drying, through the cock *j* into the coiled tube *k* of steel or other

suitable material, which is heated by means of the lamp *l*, and is contained in the chamber *d* containing also the thermometer *s*.

11,105. Guénot, L. May 14, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].

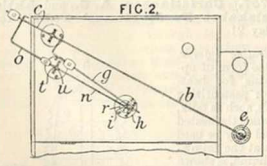
FIG.2.



Thermostats.—A thermostat, which is used to control a damper placed in the flue of a gas-producer, comprises a bent tube having a bulb 33. The horizontal arm of the bent tube is filled with mercury and extends into the flue; the vertical arm is fitted with a stopper through which passes a tube 34, cut aslant at the bottom and carrying a burner at the top. The damper 29 is actuated by the bell of a small gasometer placed in proximity to the flue. Water gas is delivered to the gasometer by a small pipe 31, is led by a pipe 32 into the bent tube, and passes to the burner. If the temperature of the flue increases, the mercury expands and closes the pipe 34. Consequently, the bell 30 rises and the flap or damper is closed. A valve may be interposed in the supply pipe 31 to enable the temperature to be regulated to some extent.

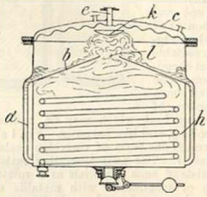
11,289. Edmends, T. May 17.

FIG.2.



Thermostats.—In temperature-regulating apparatus for incubators, the chimney damper *e* is connected to a balanced lever *b*, *c*, the long arm *b* of which is about twice the usual length to increase the range of movement. This lever is actuated by another weighted lever *g* pivoted at *h* close to the top of the capsule rod *i* to which the lever is connected. A third weighted lever *n*, *o* is connected with the short arm of the lever *b*, *c* and with a damper *r* covering the air shaft of the incubator. This lever passes through a socket *u*, in which it is fixed by the turn-screw *t* so as to permit of actuating the air shaft damper *r* before, after, or simultaneously with the lamp-chimney damper *e*. An extra lever may be interposed between the lever *b*, *c* and the lever *g* to increase the sensitiveness.

11,436. Fischer, E. May 18.



Boiling-pans.—A hard resin soap, for use in paper-making, is made with the smallest quantity of water in which saponification can take place. The soap is boiled in the lower chamber *h* of the pan. The foam passes up through the opening *l* and returns by the pipes *d* together with the steam condensed on the water-jacketed cover *c*. The baffle *k* prevents the steam from passing off through the orifice *e*, which is provided for the escape of the carbonic acid generated in the course of the operation.

11,460. Bauer, M. May 18.

FIG.3.

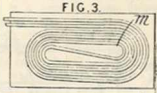
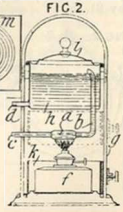
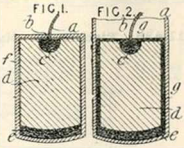


FIG.2.



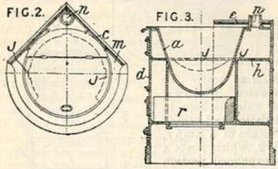
Heating water for hot-water pillows. The water is kept in circulation and heated by means of a lamp *f*, Fig. 2, which heats a flat expanded portion *a* of the return pipe *c* which is connected to one end of the coil *m*, Fig. 3, of the pillow. The heated water ascends by the pipe *b* and flows into the reservoir *h* to a level just below the vertical orifice of the pipe *b*. The pillow is supplied through a pipe *d* at the bottom of the reservoir. The reservoir is fitted with a cover *i* and is supported by a portable frame *g* which also carries the lamp. The heating power of the lamp is varied by adjusting a vertically-movable casing *k* by means of a clamp as shown.

11,468. Lang, A. May 24, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].



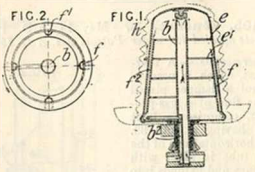
Heating liquids.—Relates to heating-cartridges consisting of materials which do not contain carbon and which, when ignited by a suitable device, react chemically upon one another and burn without access of air, generating heat which may be utilized for cooking, boiling, and like purposes. Fig. 1 shows a section through one form of cartridge enclosed in a metal case *f*. The heat-generating material *d*, which consists of such materials as a mixture of aluminium or magnesium with metallic oxides, rests upon a layer *e* of good conducting material, such as sheets or filings of copper or copper alloys or other metal, and is ignited by a fuse *a*, an igniter *b*, and an igniting-substance *c*. The entire charge may be protected against moisture by painting or enveloping it with a material *g*, Fig. 2, such as water glass, magnesium foil, or the like. The heat generated by the cartridge is transferred to any material surrounding it, such as food or liquids, but, in the latter case, the cartridge is preferably contained, as shown in Fig. 2, within a metal tube which is closed at one end and may be placed in the liquid to be cooked, boiled, or the like.

11,734. Watt, C., and **Campbell, D.** May 21.



Boiling-pans.—A portable metal casing to hold a boiling-pan for culinary and laundry purposes &c. is of the sectional shape shown in Fig. 2 and has sliding doors and a furnace, a cover and baffle-plate forming a passage for the products of combustion. The metal cover *m* of the casing *d* has covings *c* to prevent the overflow of liquid, and a central aperture to permit the fitting of a hinged or an ordinary wooden lid to the pan *a*. The products of combustion pass from the furnace *r* to the flue *n*, being caused to take a circuitous path by the annular baffle-plate *h* provided with smoke ports J. The doors of the ashpit, furnace, and flue slide in frames on the casing.

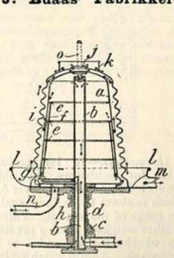
11,756. Christiansen, A. C., and **Aktieselskabet P. J. Buaas' Fabrikker.** May 21.



Heating gases and liquids.—In surface apparatus applicable as a condenser, pasteurizing apparatus, and the like, the fluids between which an exchange of temperature is to take place, flow inside and outside, respectively, a revolving conical chamber. The centrifugal force prevents the accumulation of condensed fluid on the inner surface of the chamber. The chamber, which is provided with an inlet pipe *b*, is divided internally by horizontal rings *e*, e^1, which collect the fluid of condensation. Each ring is provided with a pipe *f*, f^1, carrying the fluid to the widest part of the chamber. The inlet pipe is divided at the base by a vertical partition into two compartments. One compartment is connected to the supply pipe while the other compartment b^2 serves to carry off the fluid of condensation to the outlet pipe. The chamber may be surrounded by a mantle *h* so as to form an external passage for one fluid.

11,757. Christiansen, A. C., and **Aktieselskabet P. J. Buaas' Fabrikker** May 21.

Heating liquids.—One form of apparatus for heating or pasteurizing fluids, such as milk, in which the heated liquid may be used to heat the following liquid, is shown in sectional elevation. A steam chamber *a*, rotatably mounted upon a steam-inlet tube *b* and driven by a bevel-wheel *c*, to which it is attached by a sleeve *d*, is surrounded by a, preferably, corrugated mantle *i*, fitted with an inlet tube *n*, and an outlet *j* surrounded by a perforated crown *k*. The liquid to be pasteurized passes from the tube *n* between the chamber *a* and mantle *i*, and is distributed by the crown *k* upon the outer surface of the



mantle, where it aids in heating the following liquid and is itself cooled; this cooling serves to bring sweet milk down to a temperature suitable for separating. The liquid is withdrawn through an outlet *m* in the bowl *l*. The rotating chamber *a* stirs the liquid and ejects the condensed water by centrifugal action. The water, owing to the shape of the chamber, runs down the sides on to the rings *e* and down the pipes *f*, and is removed by a fixed tube *g* and passage *h*, the former arranged for skimming or connected to a suction-pump &c. The apparatus may be used as a pasteurizing or heating or boiling apparatus, by insulating the mantle to prevent loss of heat and conducting the fluid away through a pipe *o* applied to the opening *j*. Also, sweet milk may be heated to the skimming-temperature by skim milk from an ordinary pasteurizing-apparatus, the latter liquid entering by the pipe *n* and leaving by the pipe *o*, while the former is supplied to the crown *k* and runs over the mantle *i*. Both the mantle and steam-chamber *a*, which may be stationary, can be removed for cleaning &c.

11,803. Pinkerton, J. May 24.

FIG.1.

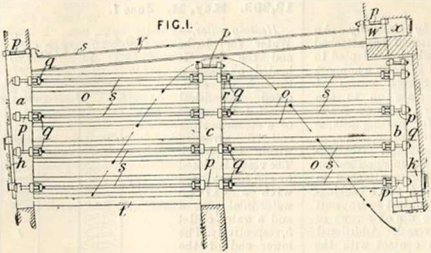
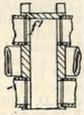


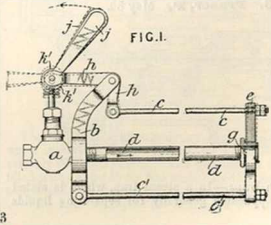
FIG.7.



Heating water.—A boiler, suitable for hot-houses and other places, is shown in side elevation in Fig. 1. Front and back headers or castings *a*, *b* of rectangular shape are connected with an intermediate header *c* by water tubes *o*, which are slightly inclined. The whole is braced together by long bolts *p*, passing through lugs on the headers and having nuts *q* which engage lugs *r* on certain of the outer tubes; these tubes thus act as stay tubes. Ribs *s* may extend between the lugs *r* of each tube. The furnace is placed underneath the front nest of tubes, and is fired through a door *h* in the front header; the firebars are formed by small water tubes *t*. At the top of the boiler is a row of long tubes *v* connecting the header *a* with a chamber *w* to which the outlet pipe *x* is attached. The inlet for the return water is shown at *k*. Fig. 7 shows the method of jointing the tubes to the headers, the tube ends being fitted into countersunk holes j^1 containing rubber or other packing-rings. The inner face of the front header is inclined to correspond with the inclination of the tubes.

12,035. Cleland, J., and **Stewart, J. C.** May 27.

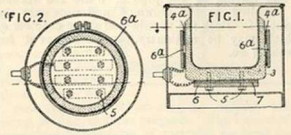
FIG.1.



Steam traps.—The expansion of a tube *d* of brass, iron, or other material, which forms the outlet for the condensed water, actuates the valve of the trap, which is contained in the body *a*. A bent arm *b* secured to the body is connected at one end to a rod c^1, as also a second rod *c*, which is attached to a rocking lever *e* pivoted at *g*. The other rod *c* is connected to a bell-crank lever *h*, which is pivoted on the upper end of the arm *b* and actuates the valve when the handle *j* is in the position shown. To blow through the valve, the handle is depressed to the left, thus lifting

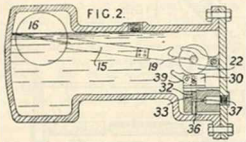
the eccentric surface k^1 from the valve spindle, and releasing the load on the valve.

12,214. British Prometheus Co., and Skipwith, H. May 30.



Heating liquids; heating by electricity.—An electric cooking and heating utensil has attached to it a heat-distributing plate, which is adapted to distribute the heat evenly and to form a support for the heating-resistances. Special modes of casting the heat-distributing plate on to the utensil are described. As shown, the inner vessel of a cooking-utensil, suitable for heating milk, is provided with a plate 3 of aluminium, brass, or other metal of low thermal resistance. Heating-resistances, such as those described in Specification No. 17,196, A.D. 1902, are securely attached to the plate 3 by means of screws 5 and a backing-plate 6, so as to be in effective contact to transmit heat to the vessel without the use of screws or rivets which project into the vessel. Additional resistances 4^a may be held in contact with the sides of the plate 3 by means of backing-strips 6^a. Insulating-plates 7 may be inserted between the resistances and the plate. To cast on the plate 3, the vessel may be tinned and heated until the tin flows; the aluminium or the like is then poured on in a molten state and allowed to cool. According to another method, the vessel may be enamelled at a high temperature, after which the metal is raised to a brilliant red heat and sufficient spelter sprinkled thereon to cause it to flow over the whole surface. The aluminium or the like is then poured on in a molten state and allowed to cool.

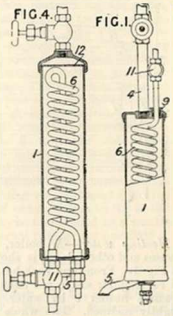
12,283. Fraser, P. May 30.



Steam traps.—In a steam trap, which is stated to be applicable generally for separating liquids and gases, a cylindrical weight 22, rolling on knife-edges 19 at the end of a lever 15, elevates and depresses a valve 33, which controls the escape of the trapped liquid. At the end of the lever 15 is a float 16. The cylindrical valve 33 has a central passage 36 and a transverse passage. In the bottom of the valve are radial grooves, through which, when the valve is pressed against the casing by the weight 22, the fluid in the trap passes to the outlet 37. A lever 39, pivoted on the U-shaped bracket 30, is connected to the upper end of the valve, which is elevated, and thus closed, when the weight rolls forwards and presses on the lever.

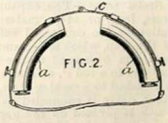
12,393. Key, H. June 1.

Heating water.—Water for baths and the like is heated on passing through an elongated cylindrical vessel 1 by means of a steam-heating coil 6 arranged within the vessel. The vessel is closed by end covers fitted with a valved water-inlet pipe 4 and a water outlet 5, respectively. The lower end of the steam coil is connected to an outlet pipe in the lower cover so as to serve as a drain. The upper end of the pipe passes through a stuffing-gland 9, and is provided with a valve 11. In a modification, shown in Fig. 4, both ends of the steam coil pass through one end cover of the vessel. The cold water as it enters the vessel 1 is divided into small streams by a perforated plate 12 located below the water inlet.



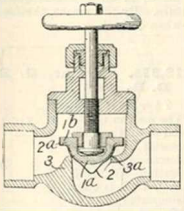
12,430. Leupold, K. R. June 1.

Hot-water bottles.—A medical heating appliance, for use as a neck compress, is formed of metal bottles *a* hinged together or adapted to slide on a hinged hoop *c*.

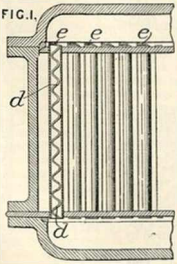


12,461. Still, W. M. June 1.

Steam traps.—Relates to a valve suitable for steam traps, and so designed that it is little liable to damage when screwed down with excessive force, and acts efficiently when the valve is slightly out of alignment. The valve body is formed with a partly spherical end portion 1^c, provided with a bead or shoulder 1^b, and fitted with a flexible facing 2, which is stamped, pressed, or otherwised formed out of thin metal. The facing may be approximately conical, spherical, or cup-shaped, and is provided with a flange 2^c so that it may be secured to the shoulder 1^b, forming an airtight space which may contain air, gas, or a volatile spirit. The metal seat 3 is made with an abrupt edge 3^a. In consequence of the limited flexibility of the valve, it has a tendency to settle into the seat with good contact even though the spindle is slightly out of alignment. If the valve is screwed down too tightly, the face will be nipped between the valve body and the seat and the resulting damage will be slight.

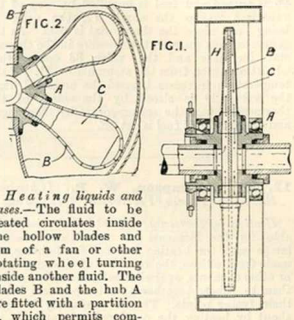


12,582. Shore, W. June 3.



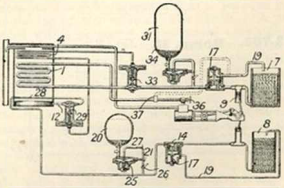
Heating gases and liquids.—Each tube of a feed-water heater, condenser, or other heater or cooler is provided with a strip or strips of metal, corrugated along their length, or having alternately oppositely-directed indentations, so that the strip or strips will break up the medium in the tubes. Fig. 1 shows a feedwater heater with strips *d* of metal traversing the tubes, their upper ends *e* resting on or being detachably secured to them. The grooves may be curved or V-shaped, and the crests may make any angle with the length of the tube.

12,606. Proctor, W. H. W., and **Morgan, W.** June 3.



Heating liquids and gases.—The fluid to be heated circulates inside the hollow blades and rim of a fan or other rotating wheel turning inside another fluid. The blades B and the hub A are fitted with a partition C, which permits communication from one side to the other at the extremities of the blades or at the rim. The whole is enclosed in the water-tight box H containing the heating-agent. The liquid to be heated passes around the partition C, circulating as indicated by the arrows. If desired, steam may be passed into the wheel, and the water to be heated placed in the surrounding box H.

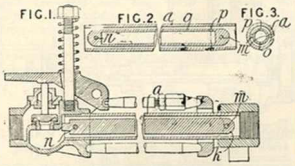
12,697. Carolan, E. A., [*General Electric Co.*]. June 4.



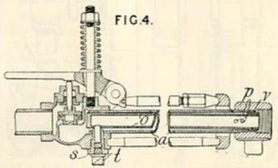
Thermostats.—The supply of fuel and feed-water is controlled by a thermostat which actuates suitably arranged valves. The generator 1 is supplied with water from the tank 7 by the pump 9, and liquid fuel is similarly obtained from the tank 8. The fuel supply at the nozzle 12 is regulated

by bevel gearing r, by universal joints, or by other means. When employed in a steam trap, the expansion tube d is cooled by the condensed water so as to actuate the valve a. When the water has been discharged, steam comes in contact with the tube d so as to close the valve a.

12,875. Ogden, J. E. L. June 7.

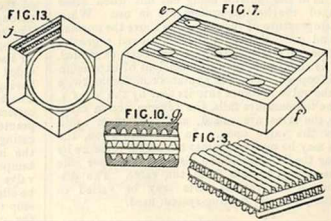


Steam traps.—In a steam trap of the expansion type, a rod or hollow cylinder is arranged in the expansion tube so as to form an annular water space which allows the tube to be cooled quickly by the deposit of water. Fig. 1 shows one arrangement in which a rod k is held within the expansion tube a by pins m, n. Figs. 2 and 3 show a modification in which a hollow cylinder o is supported inside the expansion tube. A hole p, formed in the cylinder near the inlet end of the trap, allows steam to pass into the cylinder and condense there. The water of condensation which collects in the cylinder remains undisturbed and serves to condense the incoming steam. According to the Provisional Specification, the cylinder may communicate with the atmosphere so as to be cooled



by air. In another arrangement, Fig. 4, the steam and water pass directly into the cylinder o and thence through holes p near the inlet end to the space between the cylinder o and the expansion tube a. The cylinder o is held at its open inlet end by a conical nut v. The other closed end of the cylinder is held between the conical end of a nipple s and the opposite side of the expansion tube. A plug t which passes through the nipple s normally closes communication between the interior of the cylinder and the atmosphere. On removing this plug, sediment may be blown out of the trap. The several forms of apparatus may be employed vertically as well as horizontally.

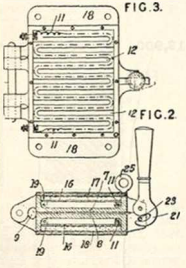
12,888. Thiébaut, C. June 13, A.D. 1903, [*date applied for under Patents Act, A.D. 1901*].



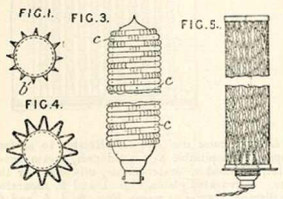
Non-conducting coverings.—A number of layers of corrugated paperboard are fastened together so as to form a compound sheet. Each layer may be covered on one or both sides with smooth paper or board, and the corrugations in the various layers may be arranged parallel or at right-angles, as shown in Fig. 3. The finished block may be strengthened by a metal frame and rivets e, Fig. 7, by plaster g, Fig. 10, or may be covered with a veneer of wood, cardboard, metal, or celluloid, and the component sheets may be impregnated or covered with varnish, paint, waterproof, fireproof, or antiseptic material, asbestos, or tar. When the sheets with parallel corrugations are used as non-conductors of heat, they are coated with asbestos, and are either wrapped around the pipes &c. to be covered, or a jacket is built up of trapezoidal panels j, Fig. 13.

13,136. Boult, A. J., [*Soc. Dubois et Emery*]. June 10.

Heating by electricity — Relates to electrically-heated cooking-apparatus. A gauffer mould consists of two jaws 7, 8, united by a hinge which is formed with a recess 9 to facilitate the scraping-off of an excess of dough. Heating-coils 11, packed in asbestos, are arranged in zig-zag fashion between recessed partitions 12, and are backed by layers of asbestos 16 and slagwool 19 and metal plates 17, 18. The ring 25 serves for the attachment of a counterweight. The mould is closed by a hook 21 and a pin 23. The partitions used in an open-topped, electrically-heated receptacle are V-shaped.



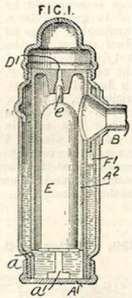
13,180. Dowsing, H. J. June 10.



Heating by electricity.—In electrical radiators, which consist of a series of incandescent lamps arranged in a reflecting-casing, means are provided for efficiently heating the air in contact with the lamps. The surface of the lamp may be provided with ribs *b*, as shown in plan in Fig. 1, or it may be corrugated. Preferably, the lamps are surrounded by conducting screens or envelopes. Fig. 3 shows a lamp around which a coil *c* of wire is helically wound. The coil *c*, which is always in contact with the lamp, may be arranged in ring form, or in straight or curved lines. The screen may be formed of chainwork, or of woven or reticulated metal. Fig. 4 shows in plan a screen formed of corrugated, perforated, sheet metal. Fig. 5 shows the screen in the form of a cylinder of expanded metal, the bent-in edges of the metal being in contact with the glass bulb. Radiators may consist of ordinary unscreened lamps alternating with lamps fitted with conducting-screens. The lamps may be so coupled up that either series may be switched on.

13,357. Harrison, G., [*Norwall Manufacturing Co.*]. June 13.

Heating buildings &c. — Fig. 1 shows in section an air-vent valve for radiators and steam and hot-water systems generally. It consists of an inner chamber A^2, connected by the nipple B with the radiator &c. surrounded by an outer chamber F^1, both being connected by a passage *a*. An open or closed float E contained in the inner chamber A^2 is provided with a valve *e*, which, on rising, closes the air vent D^1. A support a^1 resting on the cap A^1 keeps the float above any sediment. The valve is shown in the position it takes up when cold. On steam or hot water entering the radiator, the air is driven out through the vent D^1. Steam or hot water then enters the casing A^2, and by its heat causes the air in the outer chamber F^1 to expand, thus driving the water into the chamber A^2 and causing the valve *e* to close. When the water is in the chamber A^2 and the float raised, any surplus water will pass back through the inlet B into the radiator.



13,495. Chorlton, A. E. L. June 15. *Drawings to Specification.*

Thermostats. — To vary automatically the proportions of combustible and inert gases supplied to internal-combustion engines in proportion to the varying calorific value of the former, a rod which contains the throttle valves in the supply pipes is heated by gas from the gas-supply pipe, the varying calorific value of the gas controlling the expansion of the rod. A modification is described in which an arrangement of solenoids is used to actuate the throttle valves.