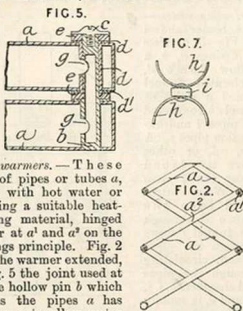
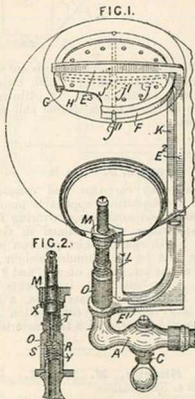


29,396. **Simons, L.** Dec. 11.



Bed-warmer.—These consist of pipes or tubes *a*, filled with hot water or containing a suitable heat-absorbing material, hinged together at *a'* and *a''* on the lazy-tongs principle. Fig. 2 shows the warmer extended, and Fig. 5 the joint used at *a'*. The hollow pin *b* which connects the pipes *a* has apertures *g* to allow water to flow and is tapped to receive the screw-cap *c*. To facilitate the turning of the upper tube, a bush *d* with flanges *d'* is fitted around the pin *b* and rubber washers *e* keep the joints water-tight. Fig. 7 shows the joint used at *a''* in Fig. 2, plates *h* connected by the pivot *i* being soldered to the pipes.

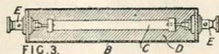
29,499. **Folwell, P. C.** Dec. 13.



Thermostats for gas burners. The frame *E'*, *E''*, which is detachably secured to the casing *A* by

a hollow screwed cylinder *O*, carries a ring *F* having a flange *G* against which a thin metal diaphragm *H* normally bears. The frame *J* consists of cross-bars *j, j'*, of which the former supports the frame *K, L* and the latter is guided in slots *j''* in the ring *F*. The flange *M* of the frame *K, L* is adjustably secured to the burner by a nut *X*, Fig. 2. The plunger gas valve *S* is normally kept on its seat *R* by the spring *Y*, and has a hollow spindle *T* which is perforated to allow gas to pass to the burner. To light the gas, the frame *K, L* is pushed down opening the valve *S*, the cock *C* being already opened. The heat of the lighted gas causes the diaphragm *H* to bulge downwards and press on the frames *J* and *K* and hold the flange *M* in one position. When the light is extinguished, the diaphragm rapidly contracts, draws back the frame *K*, and allows the spring *Y* to close the valve *S*.

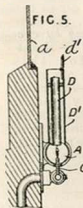
29,595. **Kraemer, F.** Dec. 14.



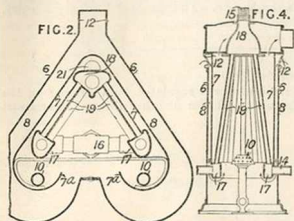
Heating by electricity.—The resistances used for this purpose are thin carbon rods *C*, supported by being embedded in composition *D* in a metal case or tube. A flat case of iron with two gauze sides *B* may be used. The composition used must have a similar coefficient of expansion and contraction for temperature variations to that of the carbons, and for this purpose there may be used a mixture of ten parts of baryte to one of silicic acid, by weight, in a plastic state. Or six parts of pulverized granite, two of pebbles, and one of lime, silicic acid, and dextrin may be used. The carbons are attached to terminals *E* by wires passed through perforations in the carbons and fixed by metal clamps. They may be connected in series, and to the studs of a rotatable switch, by which any number of the carbons may be placed in a circuit.

29,674. **Maule, E. H.** Dec. 15.

Heating by electricity.—In order to prevent condensation of moisture on a shop window or the like *a*, warmed air is delivered over its surface from a row of vertical tubes or a casing *D*, situated below it. The warming of the air may be effected by vertical coils of resistant wire, heated electrically.

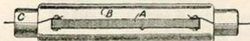


29,708. Millington, W. J., and Cannon, W. G. Dec. 15.



Heating water.—Relates to apparatus in which water is caused to circulate by heat, the water being contained in tubes. In the arrangement shown in Fig. 2, in transverse section, two casings 6, 7 are placed at a suitable distance apart so as to form air-heating chambers 8. Air enters the chambers through the openings 12, passing the curved protecting-plates 7^a, to the two perforated limbs 10 of a Bunsen burner. Two pipes 17, connected to the inflow by the T-piece 16, are also connected to the tube 18 by the inclined tubes 19, and after being heated the water passes into circulation. A flue 21 is provided for conveying away the products of combustion. The apparatus is connected to a radiator, bath, hot-water cylinder, or similar arrangement. A modification of the invention is shown in Fig. 4, in which the heating-chamber 8 is cylindrical, the water tubes 19 being conically arranged over the burner 10, as shown. The return and flow pipes are respectively shown by 14 and 15. The water tubes are shown in another modified form of the apparatus in the shape of a spiral coil connecting the lower and upper chambers of the heater.

29,726. Le Roy, F. Dec. 15.



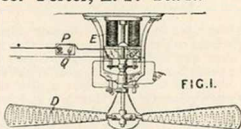
Heating by electricity.—A rod A of material of high specific resistance is connected between leading-in wires in a glass vessel B, which is filled with an inert gas, or exhausted, and provided with end caps C. Such devices are used as radiators, for warming rooms, cooking, or other purposes. The resisting-material may be silicon powder, compressed with or without an agglutinant, and baked. Specification No. 23,354, A.D. 1895, is referred to.

29,821. Schindler-Jenny, F. W. Dec. 16.

Heating by electricity.—Heating-wires are embedded in a refractory insulating material a, upon which a metal casing c is afterwards cast to form a smoothing-iron or other heater, the insulation being left partly uncovered on one side where the wires project.

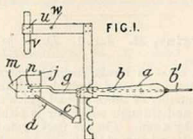


29,835. Porter, E. F. Dec. 16.



Heating by electricity; heating air; thermostats.—Heating-wires are embedded in enamel on the blades of a rotary or reciprocating fan D operated by an electric motor E, and the supply of current to both heating-wires and motor may be controlled by a curved thermostat strip P linked to a switch Q. A handle connected with the strip is movable along a scale to adjust its position for any desired temperature. Specification No. 5595, A.D. 1891, is referred to.

29,938. Hughes, F. Dec. 17.



Heating-apparatus.—Relates to an apparatus for liquefying and applying adhesive materials, and is applicable for use in sealing bottles &c. with wax, for applying the adhesive material of medical and other plasters, or for melting shellac, gutta-percha, &c. for electrical insulation. The wax &c. is supported by the adjustable clip u on the adjustable arm v above the pouring-trough m, which is heated, through the bolt or heater n, by gas supplied through the pipes b', b, c to the burner d, or by an oil or spirit burner or by electricity. The tube b may conveniently pass through the handle a of the apparatus. The bolt n is supported by the casing j on the arm g, and the trough m is made removable, so that it can be interchanged for use with a different material.

30,026. **Imray, O.**, [Grünzweig & Hartmann]. Dec. 18.

Non-conducting compositions.—A light and porous building-stone similar to cork, both as a non-conductor of heat and in respect of its specific gravity, is moulded from a mixture of kieselgühr, c'ay, and finely-divided vegetable matter, such as cork, peat, pith, husks, &c. The moulded blocks, when dry, are subjected to a red heat to burn the organic constituents.

30,793. **Anderson, C. E.** Dec. 30. *Drawings to Specification.*

Thermostats for incubators. The temperature of a hot-air incubator is regulated by a damper on the chimney of the lamp operated by suitable connections from a metal disc or other form of thermostat placed in the hatching-chamber.

A.D. 1898.

60. **Higgins, H.** Jan. 1. *Drawings to Specification.*

Heating air by passing it through the condensing-arrangements for the waste steam from steam cooking-apparatus.

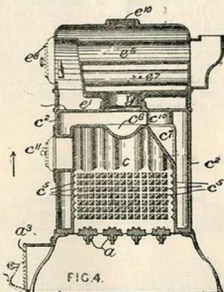
61. **Higgins, H.** Jan. 1. *Drawings to Specification.*

Heating air.—In steam drying-apparatus, the exhaust steam is passed through a chamber containing a number of tubes around which the steam circulates, and through which air is either drawn or driven by a fan. The air thus heated may be desiccated by calcium chloride and passed through those drying-chambers through which superheated steam does not circulate.

68. **Minne, J.** June 2, A.D. 1897, [date claimed under Sec. 103 of Patents &c. Act, A.D. 1883]. *Drawings to Specification.*

Thermostats for incubators. The temperature is regulated by means of three thermostats of known construction. One is placed near the water boiler and operates a damper placed over the central heating-flue of the boiler to prevent the water from being heated too much. The other thermostats are placed in the egg chamber, and operate rocking doors in the top of the incubator.

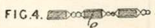
219. **Don, A.** Jan. 4.



Heating water.—Relates to boilers for heating water and raising steam, especially adapted for heating buildings, and is shown in sectional elevation in Fig. 1, in which C is an inner firebox with domed top c² and a water jacket c¹. The firebricks are corrugated, and can be partly rotated for convenience in removing clinker, while the firebox

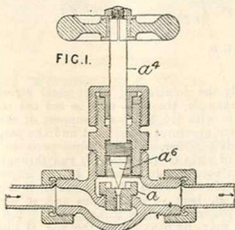
has projecting facets c^3 below to protect it from injury by overheating, and is corrugated above. The upper water receptacle is independent, and is connected to the lower chamber by a ferrule g . The products of combustion from the firegrate escape by openings between the pockets c^2 into a flue c^{10} , and circulate in the casing e^1 and flues e^6, e^7 , thereby heating the water or raising steam before escaping to the flue. The usual firing-door c^{11} , ash door a^3 , and soot door e^8 are provided, and the hot water enters the pipe system by an outlet e^{10} ; a steam receiver is provided if the boiler is intended for raising steam.

619. Turner, S. Jan. 10.



Non-conducting coverings.—Consists of a corrugated sheet of asbestos paper, millboard, or cloth, with a flat sheet secured to one side, the combination being used singly or doubled, or coiled in two or more layers round the pipe or other surface to be covered. In modifications, the air cells may be formed by securing strips of asbestos millboard on a flat sheet of the same, or strips of millboard e may be woven into asbestos cloth.

696. Grouvelle, J. and Arquebourg, H., [trading as Soc. Jules Grouvelle et H. Arquebourg]. Jan. 10.

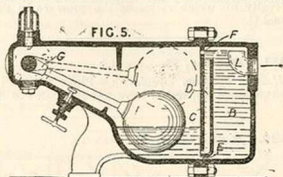


Heating buildings.—An arrangement for controlling the supply of steam to heating-coils, radiators, and the like is shown in Fig. 1, and consists of a screw-down spindle a^4 with a conical end a^6 , which controls the opening through a removable plug a screwed into the valve casing. A series of interchangeable plugs with different openings are provided so that the valve may vary the quantity of steam passing through it within wide limits.

959. Royle, J. J. Jan. 13.

Steam traps.—Relates to improvements in steam traps of the kind described in Specification No. 6231, A.D. 1882, in which a float and valve serve

to control the discharge of condensed water into a box and to a suitable exit. The object of the present invention is to remedy the tendency of the valve to remain closed when the box becomes

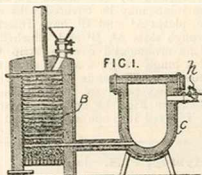


thoroughly drained. Fig. 5 shows a sectional elevation of a steam trap provided with an auxiliary box B and partition C, rendering the trap more continuous and reliable in its action, and shows a form for use with a control valve of the screw type. The partition C is made approximately water-tight, and is perforated below at E and may have an opening F above the passage D. The discharge pipe L is placed so that the water in the box B may keep as high as possible. Should the valve G become absolutely closed, the condensed water in B trickling back through the opening E lifts the ball, opens the valve, and re-starts the action.

1170. Archibald, J. Jan. 15. Drawings to Specification.

Non-conducting coverings and compositions.—Water cisterns and pipes are covered with layers of cork, flock, wood, or the like. Slabs for covering cisterns may be made by moulding ground cork, to which may be added flock or sawdust.

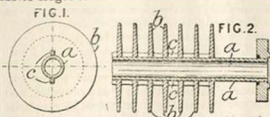
1310. Dinsmore, G. F. June 18, A.D. 1897, [date claimed under Sec. 103 of Patents &c. Act, A.D. 1883].



Heating-apparatus.—The object of the invention is to transmit heat to a distance, more particularly for incandescing or fusing refractory or other substances. Air, gas, or steam is passed under pressure through the heated coil B. The velocity of the gas is thereby greatly increased, so that the

heat is largely transformed into kinetic energy. On the gas reaching the terminal retort C or the like, its velocity is checked by a pressure valve *h*, and its kinetic energy turned into heat, the intensity of which varies as the pressure in the vessel C.

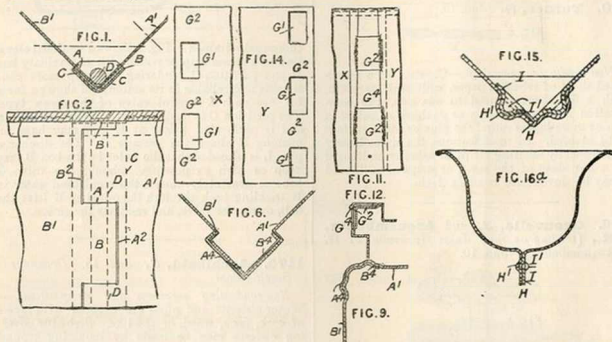
iron or steel on which are cast flanges or discs *b*, of cast iron or other preferred materials, connected by ribs or ridges *c*.



1371. Breuer, H. Jan. 18.

Heating by steam circulation.—Pipes for use in high-pressure apparatus have tubular cores *a* of

1389. Robertson, A. Jan. 18.

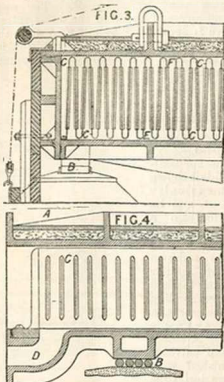


Heating-apparatus.—Relates to the manufacture, especially the jointing, of sheet-metal structures such as heating-apparatus. In making a stove oven, for example, the sides may be cut out in one sheet, which is punched and dished into the required form with ledges for the support of shelves. The ends X, Y of the sheet, shown in Figs. 11 and 14, have apertures *G*¹ cut out and the parts *G*² dished. The sheet is bent into the shape, bringing the ends together, and the dished parts on each side passed through the apertures in the other. A key or strip *G*¹ can then be run through the open space formed by the dished parts. Fig. 12 shows a corner joint secured by an angle-iron strip. The joints may be covered with ornamental strips. In the form of joint shown in Figs. 1 and 2, the plates *A*¹ and *B*¹ have interlacing tongues *A*, *B*, bent at right-angles and, if desired, turned through slots *A*², *B*² and clinched, the tie-rod *D* passing through flanges at the top and bottom of an ornamental covering-strip *C*. The tongues may be bent round the rod *D* like the sockets of a hinge. Figs. 6 and 9 show other forms of joint in which a tie-rod and covering-strips are not necessary. The ends *A*¹, *B*¹ of the sheets *A*¹, *B*¹ are bent or fluted so as to interlock and a slight taper may be given, the parts being slipped into position endwise. The form of joint may be that shown in Figs. 15 and 16^a, in which studs *H*¹, *I*¹ are pressed out of the metal sheets or flanges *H*, *I*, fitted into one another, and tapped flat with a hammer.

1442. Hyslop, P. S. Jan. 19.

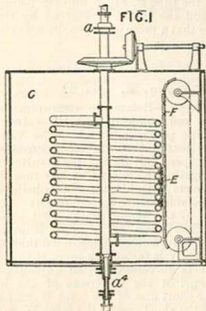
Heating gases and liquids.—Relates to a heat-exchanging apparatus for fluids, the construction of which is substantially the same as a portion of the apparatus for treating sewage described in Specification No. 914, A.D. 1897. The heat-exchanger comprises a vessel with inlets and outlets, and a separating-partition of zig-zag form with indentations or projections to agitate the flowing liquids. It is shown, in part, in longitudinal section in Fig. 4, and in transverse vertical section in Fig. 3. The zig-zag folds are preferably vertical, and the hot fluid enters and leaves by passages *D* and underspaces *E*, while the cold fluid passes by upper spaces *F*, enters at the opposite

end of the casing to D, and flows in a direction opposite to that of the heating-fluid. Provision is made for expansion and contraction of the casing A by rollers B, and of the thin-metal partition C by its mode of attachment. When the



apparatus is used for heating air by chimney gases, guard-pieces are provided at each fold of the zig-zag sheet C, to prevent rapid oxidation. Various forms of guard-pieces and their connections are referred to.

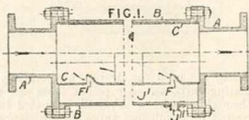
1537. **Worssam, H. J.** Jan. 19.



Heating liquids by steam. A sectional elevation of the apparatus is shown in Fig. 1, in which B is

a steam heating-coil carried in trunnion bearings and rotated by gearing, so that all deposit on the coil may be removed by the action of the brushes E upon an endless band F, which is caused to travel by the action of the coils on the brushes. Steam enters by an inlet *a* and traverses the heating-coil, thereby heating the liquid contained in the tank C, the condensed water escaping by an outlet *a'*. In modified arrangements, the steam pipe has radial branches carrying V-shaped heating-coils, and these are cleaned by revolving scrapers. In other modified arrangements, the heating-coils are circular or spiral.

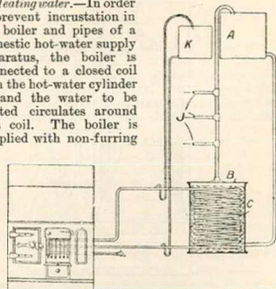
1600. **Golby, F. W.,** [Musnicki, A.]. Jan. 20.



Steam traps.—An enlarged length of pipe B is interposed in a steam pipe A to form the body of the trap, and this encloses a smaller pipe C provided with orifices F, F' so that any condensed steam may flow into the chamber J¹, and be drained away through an outlet J¹¹. In a modified arrangement, the inner pipe C is dispensed with, and a perforated diaphragm is used suitably strengthened by studs passing through the outer shell.

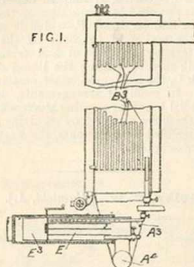
1685. **Bushell, W. H.,** and **Tubular Bath Boiler Co.** Jan. 21.

Heating water.—In order to prevent incrustation in the boiler and pipes of a domestic hot-water supply apparatus, the boiler is connected to a closed coil C in the hot-water cylinder B, and the water to be heated circulates around this coil. The boiler is supplied with non-furring



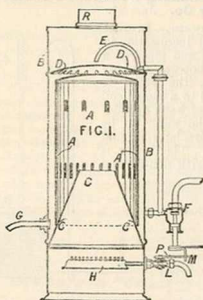
liquid from a tank K, and the water to be heated flows from the tank A, while after circulating in the cylinder C it is drawn off by the branch pipes J.

1722. Higgins, H. Jan. 21.



Heating air used for drying, evaporating, and ventilating purposes. Air passes through the shaft A¹ through the hood A², and is heated in the corrugated or roughened tubes B¹, which are surrounded by superheated steam preferably generated in apparatus of the types described in Specifications Nos. 7664, 7665, 7666, and 22,019, A.D. 1897. When used in connection with incubators, the vapour surrounding the heater is obtained by heating a liquid having a lower boiling point than that of water. In a modification, the heating-chamber consists of a large tube placed inside the air shaft, which is built in a chimney.

1763. Winterhood, J. Jan. 22.



Heating water.—A perforated and corrugated cylinder A, having an upper closed end, rests upon a hollow conical base C, so that water entering the apparatus by a pipe E passes through the perforations of the plate D and trickles down the sides of

the cylinder A and outer casing B. The hot gases and products of combustion, from a gas burner H below, pass upwards and mingle with the streams of water flowing down, thereby heating the water, which escapes by an outlet G, while the waste gases pass away by a flue R. The respective operating-levers M and P of the water valve F and gas valve L are linked together so that they are turned on and off together, and provision is made for the regulation of the supply when boiling water is required.

1782. Rouquand, J. M. L. Jan 22.

Heating liquids;

boiling-pans.—An apparatus for heating liquids is shown diagrammatically in Fig. 4, and its application to a boiling-pan or

copper for use in laundries is shown in Fig. 8, similar parts being marked

by corresponding reference letters. A boiler having a feed-tube A closed by a flap valve K

is furnished with an ascension tube E the branch pipe

G of which is controlled by a valve O and float F. During the admission of water by the inlet pipe,

the valve O remains partly open for the escape of air from the ascension pipe, but as soon as the

water level rises above the branch the valve closes automatically. When applied to a boiling-pan or

copper the steam formed in the boiler forces the water up the tube E, Fig. 8, into the boiling-pan or

copper, and the liquid is returned by the return pipe A so that a more or less continuous circulation

is kept up.

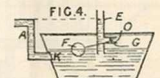
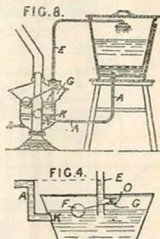
1798. Lecocq, E. Jan. 22.

Steam traps.—Relates to improvements in the balancing and connection of the valves used in

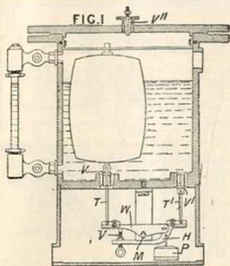
steam traps possessing floats. The valve V to which the float is attached opens inwards, while the valve V¹ opens outwards. Both valves are

connected together by means of the rods T and T¹ and the levers W and H, the system being balanced and independent of the steam pressure. The valves are closed by the weight of the float alone. The lever W has arms of unequal length, and is

centered upon a knife-edge M. To the short arm of the lever W is fastened a lever H the long arm of which is traversed by an adjusting-screw v

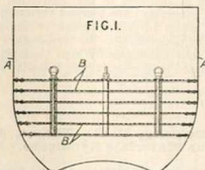


lever H. The rods T and T¹ may be suitably regulated in notches provided. By this arrangement the valves can be mounted more precisely,



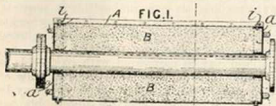
and leakage so prevented. The valve V¹, closing only when a certain pressure is reached by the entering steam, allows the air to escape from the receptacle.

2031. GeorGIN, H. Jan. 25.



Boiling-pans.—A boiling-pan A for beer worts is provided with a number of horizontally-disposed perforated plates B.

2184. Wertheim, L. Jan. 27.

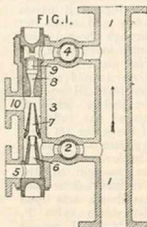


[?] *Non-conducting coverings and compositions.*—The ash which collects in the tubes and flues of steam

boilers is used as a non-conducting covering. Fig. 1 shows the arrangement applied to a steam pipe, in which A is a casing of sheet iron or the like supported on flanged collars a, and connected thereto by small bolts i. A slit is left in the casing for filling in the ash B, which is packed as uniformly and tightly as possible.

2285. Willcox, P. F. C., Willcox, H. W., and Willcox, R. J. N. Jan. 28.

Heating liquids.—Relates to apparatus for heating water or other liquid by means of steam, and for increasing the temperature of the rejected steam after being used as a heating-medium for the evaporation of water or other liquid. In the combination the rejected steam is at a higher temperature than usual, and so the average temperature of the evaporator is raised.



An injector or equivalent direct-contact steam-condensing device is inserted in the delivery pipe, so as to take the water from one part of the pipe and force it back to another part at a higher temperature. Fig. 1 shows a sectional view of the arrangement. The injector 3 takes water from the delivery pipe 1 through the cock 2 and returns it in a heated condition through the cock 4. Between the branches to the cocks 2 and 4 a non-return valve may be fitted in the delivery pipe, and may be provided with an adjustable load or spring.

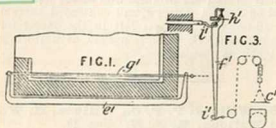
2424. Metcalfe, J. Jan. 29. *Drawings to Specification.*

Heating water.—In a filtering and heating apparatus, more especially intended for treating boiler feedwater, the steam from the filter heating-jackets is mixed with, and heats, the water before the latter enters the filters.

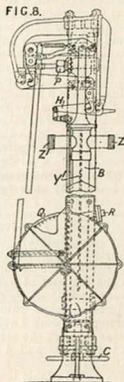
2499. Casse, W. F. E. Jan. 31.

Thermostats.—A thermostat and regulating-device is shown in Fig. 3 applied to a baker's oven, indicated in section in Fig. 1. A metal tube or bar g¹ passing through the oven is secured at one end to a frame e¹, the other end having a hook h¹ engaging with a lever f¹ pivoted at h¹ upon the frame e¹, and connected at its end i¹ by a chain to the damper c¹, which affects the admission of air to the oven and thereby regulates the temperature. In Fig. 8 is shown an apparatus for regulating the temperature of a

fluid by operating a valve controlling the admission of a fluid, such as steam. The liquid

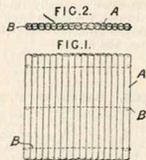


entering at Z passes down and then up through the tube before leaving at Z'. The cone screw C when turned adjusts the lever H so that the paddle wheel Q escapes the influence of the water jet issuing from the pipe R. The lever H through the medium of the lever and rack mechanism shown acts upon the steam valve P, and is itself moved when the temperature of the liquid rises above the normal owing to the expansion of the pipe B. Another form of apparatus, in which the admission of a liquid such as ammonia is controlled, is described and illustrated in the Specification.

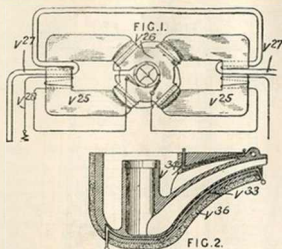


2722. Thompson, W. P., [Waage, T.]
Feb. 2.

Non-conducting coverings.—A covering for steam pipes and the like consists of a sheet or mattress made by connecting together a series of tubes A filled with infusorial earth or the like. The full tubes or hose pipes are compressed between rollers to give them an approximately-square section; they are afterwards connected together by wire fastenings B and a cement or glue is applied to increase the coherence of the covering. Finally, the mattress is compressed between rolls until it exhibits an almost completely plain surface



2904. Linotype Co., Place, J., and Barr, M. Feb. 4.



Heating by electricity; thermostats.—An apparatus applicable to the melting-pots of linotype machines, and for other purposes, consists of a resistant grid V²⁶, Fig. 2, covered with insulating-material, embedded in the metal of the pot, and connected with the main circuit V²⁷ of a special dynamo-electric generator, Fig. 1. Another grid V²⁸, preferably of iron, is embedded in the pot so as to have the temperature of the melted metal, and is included in the excitation circuit V²⁹ of the generator; the thermal variation in its resistance causes inverse variation in the current produced by the generator, the temperature of the pot being thus automatically kept constant. The pot is enclosed in non-conducting material V³⁰.

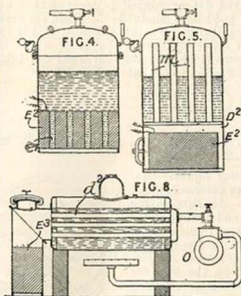
3100. Romney, H. R., Thame, J., and Fibrous Materials Syndicate. Feb. 7.

Non-conducting coverings and compositions.—In order to utilize the dust or short fibrous waste of coco-nut husks, it is mixed with any vegetable fibrous pulp, and moulded into sheets, slabs, blocks, &c. or worked into long sheets over a paper-making machine. To render the product impervious to moisture, the material is mixed with from 2 to 15 per cent. of resin, turpentine, soap, or size, or the moulded articles may be treated with a solution of glue and passed through a bath of tannic acid. To make the material as non-combustible as possible, it is mixed with asbestos dust or fibre, carbonate of magnesia, fossil-meal, whitening, and mineral colouring-matter. For floor coverings, mats, &c., the material may be permeated with oxidizable or drying oils. For packing between the hulls of battleships &c., waste fibres free from dust may be combined with larger vegetable fibres obtained from old rope, sacking, &c. The sheets or material may also be used for covering steam pipes, boilers, roofs, and railway carriages, or as packing for steam and other joints, refrigerators, &c.

3363. Cockcroft, J. Feb. 10. *Drawings to Specification.*

Thermostats.—A thermostatic capsule is employed for operating the dampers of incubators.

3468. Maxim, H. Feb. 11.



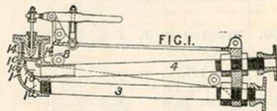
Heating gases and liquids.—Relates mainly to the production of motive power by the combustion of nitro compounds containing oxygen, such as the colloidal or amorphous compounds employed as smokeless gunpowder. The invention is also claimed as adapted for heating fluids. After giving up their heat to a fluid, the products of combustion, which contain carbonic oxide, may be burnt to still further heat the same fluid, or otherwise; the exhaust gases from a motor may be utilized in the same way. Figs. 4, 5, and 8 show the invention applied to steam generators. In Fig. 4, the combustible charge E^1 is shown immersed in the water. It is formed with perforations d^1 , which may be lined with metal tubes. The charge being ignited by electricity or otherwise, the water will be evaporated and the products of combustion will mix with the steam produced. In a modification, the perforations support vertical tubes containing water, but the water is not in contact with the combustible charge. Fig. 5 shows another modification, in which the charge E^1 is burnt in a firebox D^1 , the products passing through open-ended tubes m into the steam space. In the arrangement shown in Fig. 8, the charge E^1 is burnt in a separate chamber, and the products, after passing through the tubes d^1 of the boiler, are used alone to drive a motor O , after which they are burnt under the boiler to still further heat it. The invention is also described as applied for the propulsion of a torpedo. In this case the combustible charge, in the form of a cylinder, is enclosed in a tube so as to burn at one end, and the products of combustion are mixed with compressed air or other gas,

alone or together with the vapour of water or other liquid generated by passing the products through the liquid, the mixture being used in a motor.

3605. Gjers, L. F., and Harrison, J. H. Feb. 14. *Drawings to Specification.*

Regulating temperature.—In order to equalize the temperature of heated air or gases proceeding from stoves, regenerators, and the like which have been previously heated, the air or gas is passed through a chamber filled with checkerwork like an ordinary regenerative stove. The invention is described as applied to a blast furnace with regenerative hot-blast stoves, but it may also be applied in connection with other regenerators and with independently-heated hot-blast stoves, as well as for equalizing the temperature of heated air employed for drying and preserving timber and for other purposes.

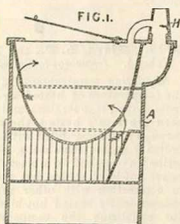
3824. Thornycroft, J. I., and Thornycroft, J. E. Feb. 16.



Steam traps.—Relates to steam traps of the kind in which the opening and closing of valves are due to unequal expansion of the parts, the object being to provide for the ready opening of valves of comparatively large area. The valve case 1 is formed with two passages 1^a and 1^b , and an annular connecting-passage 1^c surrounding the upper end of the passage 1^b . Into the valve case are screwed two pipes 3 and 4, one 3, of brass, say, secured to the steam pipe, separator, or other vessel to be drained, the other 4, of steel, say, attached to an exhaust pipe. The water-discharge pipes 3 and 4 are movable at the ends connected to the valve case, and are fixed at the other ends. The main valve 14 is made in the form of a hollow plunger, through the bottom of which is a central hole 14^a controlled by the valve 8. The main valve fits loosely in the valve case, so that water and steam can pass slowly into its interior, and it also bears against the seat 1^a . The control valve 8 is connected to the lever arrangement shown. The main valve is operated by fluid pressure, and is controlled by the supplementary valve that is itself opened and closed by the differences in the expansion and contraction of the pipes 3 and 4, which are acted upon by the steam or water.

3655. **Haighton (Limited), R., and Haighton, A.** Feb. 16.

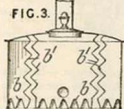
Boiling pans.—Relates to wash boilers having an exterior cast-iron casing provided with a firegrate and partitions for forming the flues, thereby dispensing with the usual brickwork. Fig. 1 shows the boiler in section. The heated gases pass in a serpentine manner from the firegrate below to the chimney H. Access openings with sliding lids are provided so that the flues formed by the partitions may be readily cleaned. The exterior casing A is constructed in two or more parts, with two or more flanges bolted together.



plates *a* which have projecting edges *b* and which fit tightly with the tube and with one another. The conical plates form narrow spaces, or cells, which have a common communicating-channel, and they have openings *c, d* for feeding the liquid into the cells and leading off the vapour produced therein. Several tubes may be combined to form a boiler or superheating-apparatus. At the ends of the tube A, or the connections of a number in a boiler, screw-plates or collars *e* are provided to press the flat or conical plates together and so secure good heat conduction. When the chamber-forming devices are within the tube, heat is applied to the outer surface of the tube, whilst in the arrangement wherein they surround the tube, the heat is applied to the internal surface.

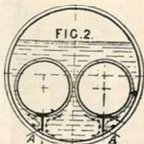
4059. **Prestwich, J.** Feb. 18.

Heating liquids.—Vessels such as kettles, pans, and the like for heating liquids have their heating-surfaces increased by constructing them with corrugated plates. The vessels may be made with corrugated bottoms, or, in addition, may have one or more pairs of upward passages for the flames or heated air formed with corrugated parallel plates. Fig. 3 shows a form of kettle in which the bottom plate *b* is corrugated, and in which the vessel is provided with parallel corrugated plates *b', b'* forming upward open passages for the flames and heated gases.



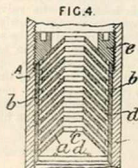
4466. **Geipel, W., and Lange, F. M. T.** Feb. 23.

Heating liquids.—Relates to internally-flued boilers for generating steam and heating water or other liquids, and consists in the application of ribs or projections from the flues for conducting heat, mainly to the lower part of the boiler. Fig. 2 shows a section of a Lancashire boiler with ribs A, which are preferably broken up into short lengths. The ribs may be arranged all over the flues, and they may be arranged transversely; or, instead of ribs, spikes or like projections may be used. The ribs &c. also promote the circulation of the liquid in the boiler.

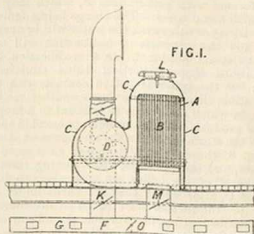


4229. **Hoffmann, A. G., and Schwarz, A.** Feb. 19.

Heating gases and liquids.—Relates to the heating of liquids and gases in flat or conical shallow chambers formed within or around heat-receiving pipes or tubes. Fig. 4 shows a longitudinal section of a tube A fitted with interval conical



4783. **Stewart, A. W.** Feb. 26.

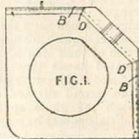


Heating air.—An apparatus for heating air, for ventilating and the like on board ship, is shown in

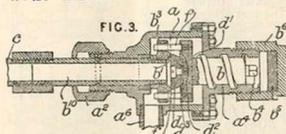
Fig. 1 and consists of a casing C, the inner shell A of coppers and the like, a fan D, operated by an electric motor, causes air to circulate through the tubes. Valves J, K, L, M, O are provided for regulating its distribution to the mains F, G. The air is preferably heated by steam circulating in pipes not shown in Fig. 1.

4785. Whittaker, J. Feb. 26.

Boiling-pans.—Relates to a frame for the tops of coppers and the like, which is adjustable, and allows the top to be removed without damage to the setting. Fig. 1 shows the grooved metal plate into which the top is fitted. The side frames B, B have curved joints D, are adjustable to allow of their being fixed at different angles, and are secured to the walls by screws or nails.

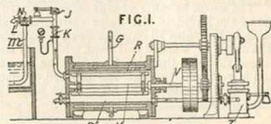


5008. Wharton, J. S. L., and Hallowell, W. S. March 1.



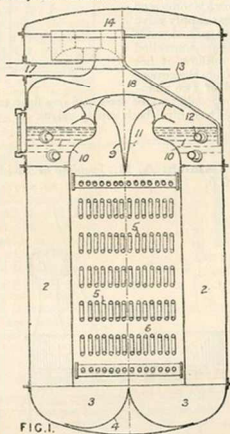
Steam traps.—Fig. 3 shows a valve, more particularly for use with a steam trap, which consists of a chamber mounted on tubular trunnions one of which is connected with the steam and water inlet and the other with an outlet and this valve, the chamber being weighted in such a way that it overturns when full of water and opens the valve to permit the discharge of the water. Within a stationary casing a, having an outlet a^2, an inlet pipe b^10, passing through a stuffing-box a^2 and carrying the valve seat b^1, is journaled so as to turn therein. The valve d has a screw-threaded stem b engaging with an internal thread a^4 in the casing and slidably connected with the tube b^10. The sliding connection may be effected as shown by rods f attached to a flange on the spindle b engaging with holes b^3 in a flange attached to the tube b^10. Thus, by partially rotating the tube b^10, the valve d is lifted from its seat b^1. Fig. 3 shows the inlet tube connected to the outer trunnion c of a steam trap. To allow the valve d a little play, it is attached to a convex plate d^1 held loosely upon a concave seat d^2 by a frame d^3 attached to the spindle. An adjustable screw stop b^1 limits the outward movement of the valve by striking against a hardened steel plate b^2 in the nut b^2.

5164. Stephan, A. March 2.



Digesters.—Size or the like is continuously prepared by forcing it by a pump Z into a closed boiler R, which is heated externally by steam supplied by a pump G, and is fitted with stirring-apparatus V. The heated size is delivered through a weighted valve J, which regulates the pressure in the boiler, to a cock N, by which it is directed into the size trough through the lower pipe m or the upper pipe L. A cock K is provided for use when the valve J needs attention.

5325. Soc. Anonyme Du Temple and Brillié, H. March 4.

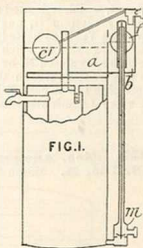


Heating liquids.—Consists of a boiler or evaporator for heating water and other liquids to obtain a supply of distilled water, or dry steam, or for other purposes. The liquid is fed through holes in pipes 1 into a cylindrical casing 2 at the bottom 3 of which it is deflected upwards by a projecting part 4 into a casing 6 in which it is heated and evaporated by serpentine steam coils 5. Priming

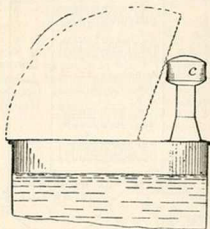
is prevented by the shape of the upper part 10 of the casing and by downwardly-projecting pieces 9, 11. The steam or other vapour emerges above the level of the liquid in the outer casing, and after passing baffle-plates 13 enters a steam separator 14 in the shape of a spiral coil from which dry steam emerges through the pipe 17, while the separated liquid is returned through the pipe 18. Concentrated liquid may be drawn off through pipes 12.

5336. Barralet, T. E. March 4.

Heating water.—Relates to means for automatically regulating the supplies of gas and water to geysers. Fig. 1 shows a geyser fitted with float valves to control the supplies of gas and water. The float c^1 in the reservoir a is connected to the water supply valve, and the float f in the reservoir b is connected to the gas-supply valve m . The gas and water supplies are controlled by the outflow of hot water from the geyser. Instead of two reservoirs, one only may be used, and one float may be arranged to control both supply valves.



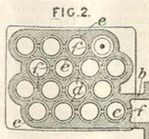
5412. Smith, A. E., [trading as Smith, J.] March 5.



Boiling-pans.—Consists in providing set boilers with a condensing-chamber such as c , fitted to the boiler top, the steam space above the water communicating with the chamber, so that the rising steam may be condensed and returned to the boiler.

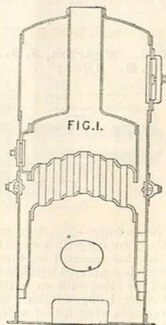
5682. Slucki, A. March 8.

Heating gases and liquids.—Relates to surface apparatus for heating liquids, gases, and the like, specially applicable to superheating steam or heating air by hot boiler gases. In the form shown in Fig. 2, the tubes c are arranged between bridges d which form the outer walls of the annular chambers e , which are connected through the greater portion of their length by slits f . The medium to be heated passes through the nozzle b to the first slit f and divides into two currents which re-unite at the second slit and circulate in this manner through the whole apparatus. In modifications, the chambers may be polygonal in cross-section.



5844. Schofield, J. March 10.

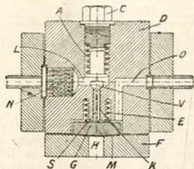
Heating water.—Hot-water boilers of the vertical type are constructed with upper and lower tube-plates having concentric 'steppings' as shown, one or more rings of tubes being fitted in each step. The two plates may be identical in shape as shown, or otherwise, and the central portion may be lower than the circumference, instead of being higher as shown.



6037. Schou, H. H. March 11.

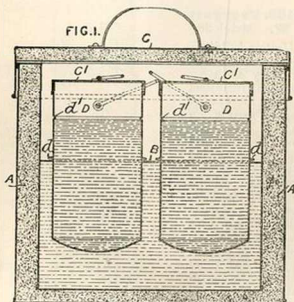
Heating-apparatus.—The Figure shows a valve for regulating the flow of gases or liquids, and is specially applicable to heating-apparatus. Through the valve body D is drilled a hole one end of which is closed by a screw C and the other end by a flexible plate M of steel or other material kept against the valve body by a covering-piece F screwed thereto. The passage K is provided with a valve seat engaged by a valve V the spindle S of which extends somewhat beyond the end of the said passage, and between it and the flexible plate M is arranged a block G . A hole H is provided in the piece F , through which pressure can be

applied to the flexible plate whereby the spring E is compressed. The block engages with the end of the spindle and the valve is opened, thereby putting the inlet L and outlet O in communication.



On relieving the pressure on the flexible plate, the valve is closed by means of the spring A. A filter or strainer N is placed at the inlet end of the casing.

6123. Hewlett, R. T. March 12.

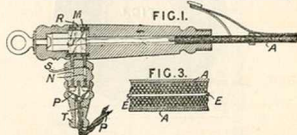


Heating liquids.—Relates to apparatus for scalding milk. The milk is placed in cans D, which have internal leads d' to indicate the limit of filling and are closed by lids C' . The cans are supported by flanges d on a partition B in a vessel A having thick non-conducting walls as shown. The cans are heated by filling the vessel with hot water to the level of the partition, and are then covered with a cap C.

6189. Greenwood, J. W., and Crossley, W. March 14.

Heating by electricity.—Relates to hair curling and crimping irons and the like heated by electricity. A wire of high resistance is wound in

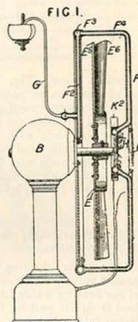
several layers on a core E, Fig. 3, and placed in the tube A, Figs. 1 and 3. Cement, preferably made of shellac and slate dust, is used to insulate the layers. The ends of the coil are attached to rings J



surrounded by swivelling rings M with projecting arms N to which the ends of the supply wires P are connected. A swivelling ring R and the parts S, T of non-conducting material protect the user.

6220. Porter, E. F. March 14.

Heating air.—An apparatus for heating and agitating air consists of a ring burner H supplied with gas from the pipe system G, F^2 , F^3 , F^4 , F, and partly closed in front by an asbestos casing I. The air heated by the ring burner is circulated by a fan consisting of a number of bifurcated blades E^2 , E^3 projecting from triangular openings in the drum-shaped hub E^1 . The fan is driven by a motor in the casing B, and the electric current for this motor is supplied by a thermo-electric battery K^2 , the inner ends of which are heated by the burner.

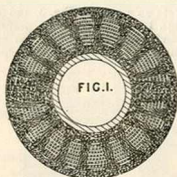


6616. Michell, H. C. March 18.

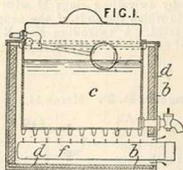
Non-conducting coverings and compositions.—Relates to non-conducting coverings for pipes, boilers, and the like, consisting of a solid outer skin or shell constructed of mica or other suitable material and a binding-medium such as silicate of soda, with the interior space thereof filled with mica flakes or particles whereby innumerable air spaces or cells are formed. Fig. 1 shows in cross-section a covering applied to a pipe. The composition is moulded to the requisite shape, and dried in a furnace. The ebullition of the binding-material causes it to permeate the layers and bind the mass together.

(For Figure see next page.)

6616.



7237. **Richmond, E. W. T.** March 25.



Heating water.—Fig. 1 shows in longitudinal section a gas-heated water-heater or boiler consisting of a cistern vessel *c* having a gas burner *f* below, and firebrick or refractory walls *d* around its sides and ends with a gas space between the vessel and walls, and a casing *b* enclosing and carrying the walls and burner. The heater may be combined with an ordinary form of gas oven or stove, or may be employed separately.

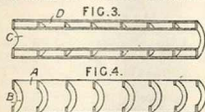
7239. **Honiball, C. R.** March 25. *Drawings to Specification.*

Steam traps; heating water.—Relates to fluid-actuated valves, which can be used as steam traps and for heating water, in which a main lift valve is raised from its seat by fluid pressure when a subsidiary valve, between the valve outlet and a chamber above the main valve, is opened. When the subsidiary valve is closed, fluid leaks past the main valve into the said chamber and the main valve closes. The inlet and outlet ports may be arranged concentric or side by side. In a steam trap, the subsidiary valve is connected to one end of a float-lever. By providing two inlets the invention may be applied to a valve in which water is heated by mixing steam with it.

7436. **Spicer, E., Colthrup, C. W., and Snowdon, Sons, & Co.** March 28.

Non-conducting coverings.—Non-conducting coverings for steam pipes and flanges are constructed from asbestos sheets and rings, and have hollow chambers which are filled with non-conducting material. Figs. 3 and 4 illustrate two

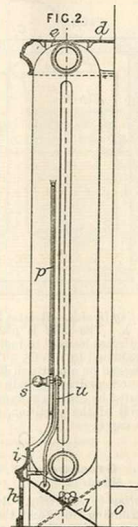
stages in the construction of a sectional non-conducting cover for a pipe. A sheet of asbestos *C* is moistened and bent to the shape of a pipe, and a number of asbestos strengthening-rings *B* are fastened to it on the outside. Another sheet of



asbestos *A* is then bent and fitted to the outside of the rings *B*. By this means spaces or receptacles *D* are formed, which can be filled with fossil meal or other non-conducting material, thus providing an insulating-covering. Two similar sections are formed, and are adapted to the pipe and secured by bands or other means. The sections may be hinged together, and may be secured to the pipes or flanges by canvas wrappings, or by bands or buckles. Enlarged forms of similar construction can be used to encircle pipe flanges and so protect them.

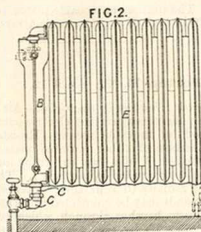
7463. **Froggatt, W.** March 28.

Heating buildings.—A radiator of ordinary construction is furnished with a loose solid top *d* resting on lugs *e*, while, below, the front of the radiator is closed in by a loose perforated casing *h* held in place by springs *i*. Air is admitted to the radiator from outside by an inlet *o*, or from the room through the perforated casing, according to the position of a pivoted plate *l*, and it passes up between the sections until an outlet is afforded above the abutting ribs *p*. The solid top prevents hot air passing between the radiator and the wall, which is thus protected from discoloration. The position of the plate *l* is controlled by a rod *u* and handle *s*.



7842. Kirkland, T. April 1.

Heating buildings.—Relates to swinging heat radiators or absorbers for use in hospitals and other buildings. Fig. 2 shows the apparatus in side elevation. The radiator is carried by a wall bracket B. The lower lug and pivot c are tubular, and the upper lug and pivot may be tubular or solid. The lower pivot enters the swivel gland C communicating with the pipe service. A foot provided with a roller may be employed to afford additional support for the radiator. When the radiator is used in front of an aperture in a wall through which air is admitted, a detachable baffle-plate E may be employed.

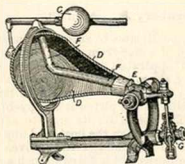


7848. Penrose, E. K., Mallison, J., Ottolenghi, L., and Ottolenghi, E. April 1.

Non-conducting compositions.—Relates to compositions specially adapted for protecting iron buildings and the like from the effects of extreme heat and cold. The juices of plants of the families of agaves, aloes, opuntias, and cactus are employed. The composition preferably used is prepared as follows:—17 kilos. of *agave americana*, *agave mexicana*, *agave sisalana*, or *aloe vulgaris*, 3 kilos. of *opuntia vulgaris*, and 100 grammes of quince seeds are soaked in water, and to the extract is added 30 kilos. of quicklime.

7885. Oliphant, W., [A. A. Griffing Iron Co.]. April 2.

Steam traps.—Relates to a steam trap operated by the accumulation of the condensation water, which passes through a check valve at E, and into the bowl D by the pipe F. When the weight C is overbalanced, the bowl settles in the frame and opens the valve G, allowing the water to flow out through the check valve into the boiler. The trap may be used as a boiler feeder.



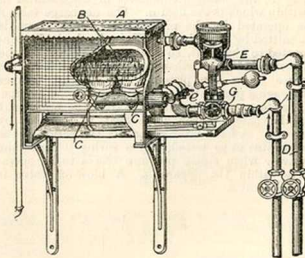
8058. Wilson, H. H. April 5. *Drawings to Specification.*

Heating buildings.—A stand, for drying coats &c., comprising a series of hot-water or steam pipes may be used to warm the apartment in which it is situated.

8306.

8306. Oliphant, W. April 7.

Heating water.—The water-heater shown in the Figure has a suitable tank A with a coil of pipes B and a burner or series of burners C. The water-supply pipe D is connected to the valve E, which opens when the water is turned on and allows the water to enter the pipes B. The valve spindle e is connected to the gas supply valve G so that, when the valve E opens, the gas is automatically allowed to pass to the burners. A pilot burner is provided, or a bye-pass may be provided, for lighting the

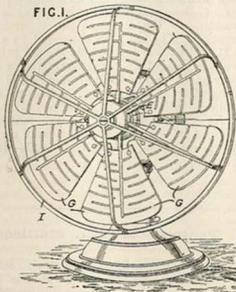


burners. The burners have baffle-plates to spread the flame. A hand-cock may be provided to turn the gas off, instead of the automatic arrangement.

8539. Porter, E. F. April 12.

Heating air ; heating by electricity.—Air is heated by carbon resistances carrying electric current, and is displaced by movable means. Resistances of moulded carbon or other suitable material may form the blades *G* of a fan driven by an electric motor, and surrounded by a guard *I*. The blades are divided radially to near their outer ends, and their inner ends may be connected in series to rings and stationary brushes through which current is supplied. The blades may also be slotted transversely as shown to lengthen the path of the current, and made thinner towards their wide outer ends. They are secured by non-conducting screws to non-conducting arms *E* on the motor shaft. The invention is a modification of that described in Specification No. 5595, A.D. 1891.

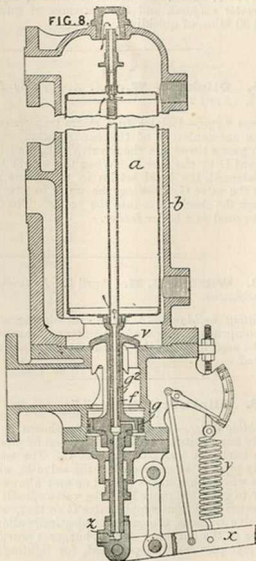
FIG. 1.



8629. Forster, A. April 13.

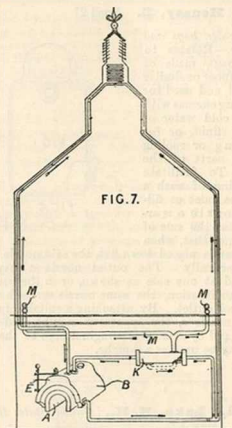
Steam traps.—Relates to automatic apparatus for the discharge of water from steam separators and other steam apparatus. The discharge valve is operated by a steam piston the supply to which is controlled by a float, the arrangement being such that the motion of the piston is a copy of that of the float. The steam on its way to actuate the piston is passed through the float, and any water of condensation in the float is thus driven out. A spring or counterweight is fitted in such a way that the discharge valve is closed when the steam pressure within the apparatus is inoperative. Means for enabling the apparatus to be worked by hand are also provided. In the arrangement shown in Fig. 8, the water accumulates in the chamber *b* within which is the float *a*. The discharge valve *v* is operated by the piston *g* to which steam is admitted by the valve *f*. The valve is rigidly connected to the float, so that a rise or fall of the latter admits or exhausts steam to or from the space below the piston. The exhaust escapes through a perforation at *g'* into the discharge pipe. The steam passes to the valve from the upper part of the chamber through the float, as indicated by arrows. A hand-lever *x* permits the action of the apparatus to be tested, and a spring *y* closes the valve *v* when steam pressure ceases to be operative within the apparatus. A blow-off valve is attached at *z*.

FIG. 8.



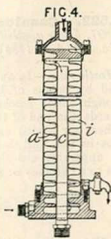
8729. Fisher, R. P. April 14.

Heating buildings &c.—Relates to apparatus for heating and ventilating by means of water and steam circulation. Boilers made in two or more sections, preferably of saddle type, placed one above the other and heated by one furnace only, are employed, one section supplying the hot water, and another low-pressure steam which can be used for heating or for ventilation. Fig. 7 shows in elevation the connections of a boiler to a radiator flooring, and spiral ventilator. Over the boiler A another and larger boiler B is placed, the space between them acting as a flue from the furnace. A receiver E of suitable shape is formed on the outer boiler and arranged for generating low-pressure steam. Steam may be taken to the radiators K, or may be conducted to the top or other part of the building to produce ventilation. The water heated is conducted by pipes M and circulates to any part of the building. By these means radiators, cooking-tables, calorifiers, green-houses, or other buildings may be heated and ventilated.

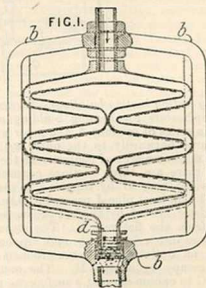


9004. Frank, S. April 18.

Heating gases and liquids.—In apparatus used for interchange of heat between fluid bodies, use is made of tubes or pipes corrugated helically both inside and out. Fig. 4 shows an appliance which may be used for cooling liquids or condensing steam or vapours. In this the helically-corrugated pipe *a* is furnished with inner and outer pipes *c*, *i* by which two helical passages are formed for the two fluids. Either or both of these pipes *c*, *i* may be omitted, and the corrugated pipes may be arranged horizontally or otherwise so that the fluid to be treated passes over or through them.



ends coupled or cast together, forming a joint inlet and outlet, are confined in the frame *b*, and are arranged to raise the outlet *d* from its seating when containing condensed water. In a modification described in the Specification, the pipe



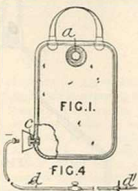
9460. Conlong, J. April 25.

Steam traps.—Fig. 1 shows a form of expansion steam trap. A pair of zig-zag pipes with their

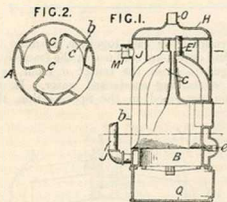
system is fitted into a closed box, and the outlet for the condensed water is formed in the side of the box.

9650. **Heussy, E.** April 27.

Hot-water bags and the like.—Relates to water bags, made of india-rubber or similar material, and used for supplying enemata with hot or cold water or other fluid, or for heating or cooling various parts of the body. To facilitate the filling of such a bag, the inlet or filling-nozzle *a* is arranged at the side of the bag, so that, when the latter is placed down flat, the said nozzle projects vertically. The outlet nozzle *c* may be arranged at one side as shown, or in the bottom. In a modification, the same nozzle serves both as inlet and outlet. By attaching a suitable tube *d* to the nozzle *c*, the apparatus may be used as an enema, and by attaching a vaginal pipe to the end *d'* it may be used as a douche.

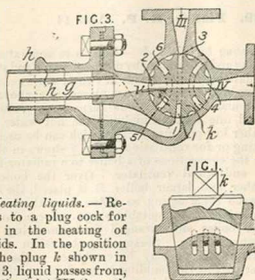


10,131. **Lake, H. H.,** [United States Heater Co.]. May 3.



Heating water; heating buildings.—Steam boilers and water-heaters for heating buildings are built up from a series of sections *A*, the inner walls *c* of which curve outwardly to the outer wall *b* so as to give a minimum area of contact. In the present example there are three sections connected to a hollow water ring *B* by nipples *e*, so that water entering by an inlet pipe *J* passes into the sections and is there heated by the hot products of combustion from the firegrate *B*. The steam or hot water passes into a drum *H* through nipples *E* and away by an outlet *O*, while the products of combustion escape by a pipe *M*. The sections are lobed at *C* to expose as great a surface as possible, and the boiler is carried upon a cylindrical base *Q*.

10,324. **Levy, A.** May 5.



Heating liquids.—Relates to a plug cock for use in the heating of liquids. In the position of the plug *k* shown in Fig. 3, liquid passes from, say, the inlet III through the passage 3, 1, and thence to an outer pipe *h*, while hot air or steam passes from the inlet IV through the passage 4, 2 to an inner pipe *g*. On turning the plug through 45° in the direction of the arrow *r*, liquid passes through the passage 6, 5 to the inner pipe, and hot air or steam passes through the other passage to the outer pipe. The plug is turned-off by rotating it through 22½° from either of the above positions.

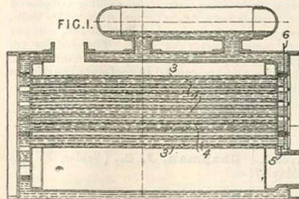
10,522. **Casalunga, D. A.** Oct. 8, A. D. 1897, [date applied for under Sec. 103 of Patents &c. Act, A. D. 1883]. Drawings to Specification.

Heating air.—In an apparatus wherein wood is dried by means of hot gases in a circular gallery through which trucks carrying the wood traverse, towards the end of the process the wood is caused to heat air which enters the gallery through passages in the wall thereof. The moist gases from the apparatus are also caused to heat air as they pass to a chimney or its equivalent.

10,571. **Maurice, L.** May 9.

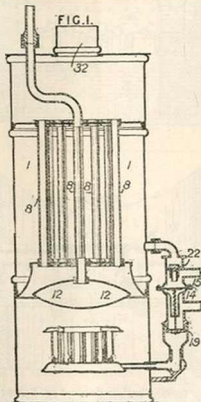
Heating gases and liquids.—Relates to the storing of heat by means of certain eutectic mixtures, and to its transmission to liquids or gases. Bodies such as potassium nitrate, and mixtures of various nitrates, which fuse and remain liquid at high temperatures without decomposition, are employed to store up and give out heat as required. Fig. 1 shows the application to a fireless boiler. The heat-storing mixture occupies the annular spaces 3, and water circulates in the tubes 4. The tubular arrangement is heated so as to bring the mixture

to a high temperature. After the extinction of the fires the heat stored can be utilized to produce steam for working motors for carriages, trams, or the like. Each annular space 3 is connected by a



small tube 5 to a discharge tube 6, and the decomposition of the mixture is made known by the escape of oxygen through this discharge tube. The arrangement can be applied to boilers working under normal conditions, in order to obtain regularity in the transmission of the heat and thus ensure safety.

10,577. Winterflood, J. May 9.



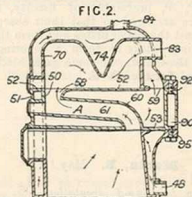
Heating water.—Fig. 1 shows a water-heater having a tubular boiler 1 and a disc-shaped vessel 12 for deflecting the products of combustion from the atmospheric gas burner through the tubular stays 8 to the flue pipe 32. The automatic valve attachment consists of two chambers separated by a rubber diaphragm 14. Water enters the upper

chamber by the inlet 15, and pressing on the gravity valve 22 opens it and passes to the boiler. At the same time the water depresses the diaphragm 14 and the gas valve 19, allowing the gas to flow to the burner. The upper end of the gas-valve spindle is surrounded by a spring and tube as shown.

10,585. Thompson, W. F., [Chemisch-Elektrische Fabrik "Prometheus" Gesellschaft mit beschränkter Haftung]. May 9.

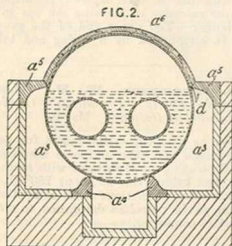
Heating by electricity.—Resistances for heating cooking-vessels and other purposes are made by repeatedly coating metal surfaces with hard copal varnish, and baking this at about 250° C., after which a coating of precious metal is applied and burnt on, as in porcelain decoration, to serve as the resistant conductor.

10,612. Best, T. J. May 9.



Heating water, boilers for. The furnace consists of four parts, viz., the ashpit section, not shown, the firebox section, top section, and intermediate section. Of these, the intermediate section is composed of inner and outer casings 50, 51 with diaphragms 52, 53, 60, and 61, the last two forming a fire flue A, and this section has screwed sockets 90 for the reception of bolts 92 which pass through lugs 95 of the top and fire chamber sections. The fire section is surrounded by a water chamber, and the top section has a water chamber, the inner casing 70 of which is indented at 74. The fire, intermediate, and top sections each have one rear extension and two side extensions, forming vertical passages and registering to form water channels which are blinded in places by diaphragms. The products of combustion from the fire section pass through the flue A and passage 58 and thence through the passage 83 to the chimney. The water circulates from the fire-section jacket to the intermediate-section jacket, and then rises through the passage 59 to the top-section jacket, and passes through the passage 84 to the coils of the hot-water system not shown, and returns to the furnace through the passage 48.

10,706. Thomas, C. W. May 10.



Non-conducting coverings for boilers and furnaces. Bricks a^1 , preferably of fireclay, shaped as shown, are arranged so that their sharp points d bear against the boiler plates and form the flues a^2 . Interlocking bricks a^1 form a covering for the crown of the boiler. In some cases studs may be substituted for the ribs d .

10,977. Marin, E. May 13.

Heating by liquid circulation.—Tubes for this purpose are made with one or more longitudinal corrugations, which may extend to the ends. The tube has no sharp angles, so as to facilitate cleaning. One form is shown in Fig. 2.

FIG. 2.



One form is shown in Fig. 2.

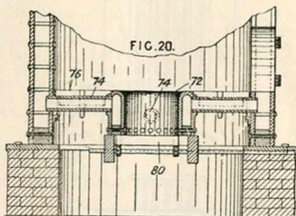
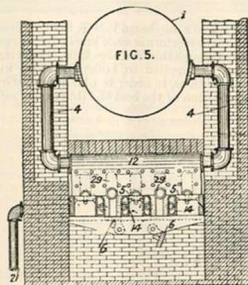
11,062. Mond, R. L. May 14.

Heating gases and liquids.—Relates to the heating of fluids for generating steam or vapour, for distilling or concentrating, by passing through the fluid a heated molten metal or alloy. The metal or alloy, with a fusing point below the temperature to which the fluid has to be raised and a boiling point above that temperature, is heated by direct contact with flame or hot gases. When applied to a steam boiler, the heating-substance may be forced by automatic feeders into the boiler, and discharged at the bottom, and raised to the heating-chamber to be again fed into the boiler. For heating liquids in open vessels, the molten alloy descends by gravity through the liquid, and after being discharged is raised by pumping or otherwise to the heating-chamber.

11,119. Ommelmann, H. May 16. *Drawings to Specification.*

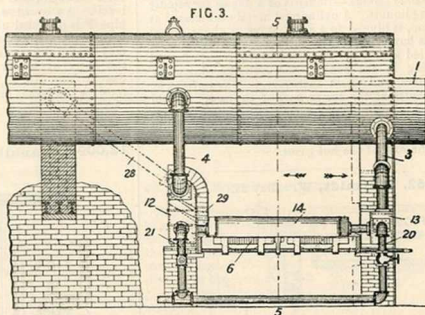
Heating liquids.—A bottle case, for use by excursion or hunting parties, for sending samples of beer, wine, brandy, &c., is formed with double walls, between which is inserted a layer of felt, cork, or other non-conductor of heat. The bottles are enclosed simply in holders adapted to contain also hot water, and are carried in perforated partitions in the case.

11,236. Chapman, J. C., [Saylor, F. G.]. May 17.



Heating water, boilers for. Fig. 3 represents in longitudinal elevation the boiler with its water-circulating grate and accessories, Fig. 5 a transverse vertical section on the line 5-5, Fig. 3, and Fig. 20 the application of the invention to a vertical boiler. Front and rear water chambers 13, 12 are connected with the boiler 1 by lateral water-circulating tubes 3, 4, and with each other by water chambers 14 of flattened trough-shaped section. Blow-off

pipes 20 and 21 are also provided. The circulating-pipes may stand at an angle, as for instance as shown at 28. By reason of the water troughs the fuel-supporting gratings are placed at different levels 5 and 6. The latter are capable of being dumped from the front. Modifications in the shape of the troughs and their connections with each other are described and illustrated in the Specification. In place of the troughs, water coils may be substituted. For smoke consuming purposes, the firebridge chamber is pierced by a series of tubes 29 to take air into the combustion chamber. As shown in Fig. 20, the lower portion of the vertical boiler is constructed with the annular water chamber 72 having the connecting water branches 74. A dumping-grate 80 is fixed to the lower end of this chamber, and a fixed peripheral grate 76 at a higher level.



11,583. Tetlow, H. May 23. *Drawings to Specification.*

Heating liquids.—Compressed and heated air is used instead of or in conjunction with steam, for heating the size in machines for sizing yarns and threads and in the vats used in making the size.

11,787. Lake, H. H.,
[Leitch, M.]. May 24.

Heating buildings &c.—Relates to thermostatic valves for radiators. Ordinary screw-down valves are converted into thermostatic valves by attaching to the stem C an annular valve G, and adjustably supporting from the latter an expansible body I by a bolt H. As soon as steam commences to flow through the valve, the annular body I is expanded and close the orifice g, and only contracts and opens a passage when cooled by the accumulation of condensed water. A strainer J is provided to catch dirt and sediment and prevent it



from entering the valve. In a modified arrangement, the expansible body is a solid cylinder, supported from the valve by a tube.

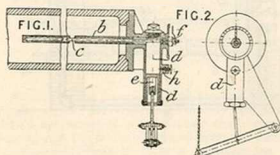
11,817. Timar, I. May 24.

Heat-storing apparatus; heating by molecular combination.—Relates to apparatus in which a solution of sodium acetate is used for storing up heat. A vessel of suitable form is nearly, but not quite, filled with the solution, and the cover is furnished with a stick or rod projecting into the liquid. When it is desired to obtain a heating effect by the crystallization of the solution, the rod is withdrawn and crystallization is thereby initiated. In order to prevent the crystals from forming a solid mass, glycerine is added to the solution.

11,819. **Fraser, T. M.** May 25.

Heating liquids.—Consists of a device for rapidly boiling liquids. A cylindrical metal case, closed at the top, is hinged to a spirit stove or above an oil or gas burner &c. A slightly-flattened metal tube is coiled within it. The spiral starts from a funnel opening in the top of the cylinder, increases, decreases, and again increases in circumference, and issues at the lower part of the case. Liquid poured into the funnel opening is heated to boiling point while traversing the tube. Openings are provided in the cylinder for the entrance of air and the exit of the hot gases.

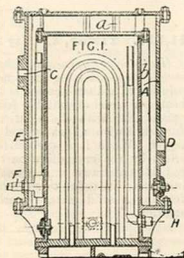
11,952. **Schmidt, W.** May 26.



Thermostats.—Relates to a self-acting temperature-regulating device for superheaters. The device is shown in Fig. 1 in section, and in Fig. 2 in end view. The metal tube *b* has at its free end a small valve opening which is governed by the internal tube *c*, which has a coefficient of expansion greater than that of the tube *b*. The body *c* is regulated by the adjusting screw *f*. The cylinder *d* has a small steam outlet *h* and a piston *e* connected by means of a lever and chain with the damper of the superheater. The draught damper is provided with a weighted lever. Instead of the piston *e*, a membrane may be used, and a liquid may be substituted for the solid body *c*. The device is shown applied to a superheater.

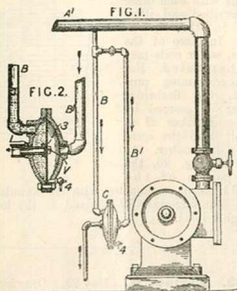
12,007. **Nesbit, D. M., and Clowes, W.** May 26.

Heating water.—Relates to feed-water heaters or condensers provided with separators for removing grease and impurities from the steam. Fig. 1 shows the heater and separator in sectional elevation. The outer casing *A* forms with the main body of the heater or condenser an impurity or grease separating space through which the steam



passes before entering the heating-apparatus or coils. The inlet *C* and outlet *D* are at different levels. An overflow and grease-collecting branch pipe *F* is provided within the separator. The ribs *d* and baffle-plates *b* within the separating-chamber may be straight, curved, or spiral. When employing the form of heater and condenser described in Specification No. 21,020, A.D. 1897, the flange *H* receives the jacket casing *A* of the separator.

12,009. **Franklin, C. R.** May 26.

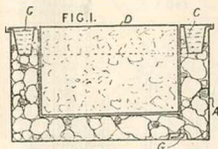


Steam traps.—A trap for removing condensation water from steam supply pipes of engines and the like is shown in general elevation in Fig. 1, while a section through the trap is shown in Fig. 2. A vertical pipe *B*, leading from the steam pipe *A*, has a branch *B'* leading to the opposite side of the trap casing *C*. A flexible diaphragm *3* divides the casing, and has fixed thereto a valve *V* controlling the outlet *1*. The water of condensation is led by the pipe *B* into the outlet side of the casing, and its weight, together with the steam pressure, tends to push the valve from its seat and allow the water to escape. The escape of water causes a balance of pressures, and the valve again closes, until condensation water has again collected. Any condensation water collecting in the branch *B'* is removed by a cock *4*.

12,097. **Schindler, F.** May 27.

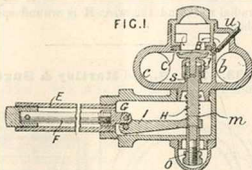
Heating by chemical action.—Relates to means for heating objects such as tins containing preserves. In the form shown in Fig. 1, the hollow casing *A* is filled with caustic lime, or a mixture of lime and fragments of earthenware, a small annular water vessel *C* being arranged at the top. The casing is exhausted through a small opening *G*, and then hermetically sealed. On driving a nail

or the like through the casing and bottom of the vessel C, the water flows on to the lime and the heat generated serves to warm a can or object D. In a modified arrangement, the heater consists of



a vessel divided into compartments for lime and water and adapted to be placed in a vessel to be heated. The heater and object to be heated may be combined to form one tin.

12,247. Coe, J. S. May 31.

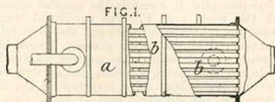


Thermostats for controlling the supply of gas to gas-heated boilers. The supply valve B is mounted on the end of a rod H by means of a screw cap j, so that a certain amount of play is allowed at the space s. The space s is regulated by a nut o. The rod is held down by the spring m, and is raised by the lever I the short end of which is pivoted to the end of the iron rod F. The outer end of the rod F is attached to the copper tube E, which is also screwed into the case G. The valve B is provided with an annular seating C of soft metal &c., the central opening of which forms the connection between the gas feed and supply tubes b, c. u is a bye pass screw controlling a direct gas connection.

12,543. Richards, T. P. June 4.

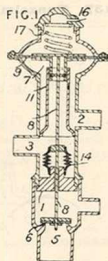
Heating air.—Air, for use in drying bottles, jars, &c., is heated in tubes b surrounded by steam in

the chamber a. Steam may be passed through the tubes b and air through the chamber a.

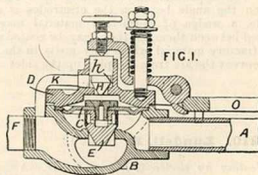


12,707. Winterflood, J. June 7.

Heating water.—Relates to automatic valve attachments for geysers wherein the gas valve opens by the pressure of the water flowing to the heater and closes when the water supply is cut off. Fig. 1 shows the arrangement. There are two chambers separated by a metallic diaphragm 1, the upper one being the water chamber and the lower the gas chamber. Water enters by the inlet 2, presses on the rubber disc 9, raises the valve and spindle 8, and flows through the tube 11 to the outlet 3. The valve 6 being raised, gas passes to the outlet 5. A rubber bellows 14 prevents the gas from leaking through to the water. The spring 17 serves to keep the valve 7 in position, and the hole 16 allows air to escape or enter.



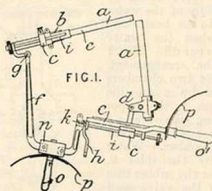
13,062. Ogden, J. E. L. June 10.



Steam traps.—A pivoted spring-loaded lever receives at one end the thrust from the rod O of material less expansible than that of the tube A,

and at the other end acts on the pilot valve H within the valve casing B. The diaphragm C is retained in position by a suitable flange cover D. A bye-pass pipe K connects the annular space *h* with the waste pipe F. The condensed water, causing the tube A to contract and the pilot valve to be relieved of the spring pressure, passes into the waste pipe F through the opened main valve E. In modified forms, a piston-bladed valve with holes or a double-beat valve may replace the diaphragm, or, for simpler forms of traps, two or more thermostatic bars O may be used and the pilot valve omitted.

13,137. Tonzelmann, G. W. de. June 11.

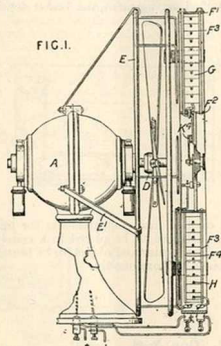


Heating by electricity.—The electrodes *a*, of an electric arc used for brazing, welding, or local heating generally, are mounted in clips *b* carried by pieces *c* sliding on guides *e* secured to parts *f* of the frame. One clip is pivoted at *g* to the pieces *c*, and one guide is pivoted at *g* to the frame, the pivots allowing the angle between the electrodes to be varied. The pieces *c* are adjusted by screws *i*, one of which can be moved laterally against a spring *k* to strike the arc. The parts of the frame are secured to an insulating-block *n* with a handle *o*. This handle, and a second handle *o'*, have shields *p*. The apparatus may be slung by a link *h*. When the angle between the electrodes is very acute, a wedge of refractory material may be placed between them, or they may be coated with a refractory material which only melts in the arc, to prevent the arc from creeping up the sides.

13,210. Lundell, R. June 13.

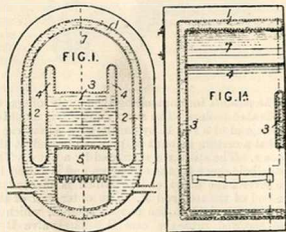
Heating by electricity: heating air.—Air propelled by an electrically-driven fan D is heated by a resistant wire H, connected in parallel with the motor A by a switch K', when desired. The fan is surrounded by circular guards E, attached by stays E' to the motor, and to a ring F', which is

connected by pairs of radial rods F², F⁴ with an inner ring F³. Grooved insulators G fit between



the radial rods, and the wire H is wound spirally on them.

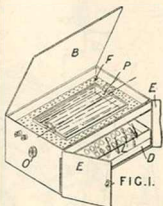
13,233. Fox, S., and Hartley & Sugden. June 14.



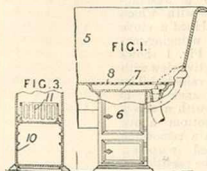
Heating water.—Relates to steam and hot-water boilers. Within a saddle-shaped water space 1, 2 is a second water space with upwardly-extending arms 4, 4, connected together by the portion 3, and containing the firebox 5. The firebox communicates with the space 7 by flues not shown, and openings through the lower parts of the walls 2 carry off the gases to the chimney.

13,303. Greville, A. E. June 14.

Heating by electricity.—Relates to the construction of an electrically-heated incubator of which the Provisional Specification states, is also applicable to foster-mothers. The incubator consists of a box A with a hinged lid B and with side doors E, E, within which a removable pane of glass D may be inserted. The eggs are placed in a removable tray L. A tray P filled with water is supported in a perforated ledge F. The heating-apparatus consists of a suitable wire passed backwards and forwards between insulating-supports secured to the bottom of the tray P. The ends of the wire are secured to terminals, which may be secured to a suitable source of electricity. The water in the tray P is evaporated, and the moisture passes to the egg chamber through the perforations in the ledge F. Ventilators are arranged in the sides of the egg chamber.



made to receive a removable fire grate or bucket 11, which may be raised or lowered by means of



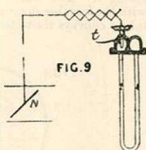
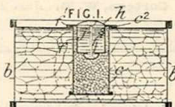
the sliding grooves shown in Fig. 3 or by other means.

13,618. Bromhead, S. S., [Möller & Pfeifer]. June 18. *Drawings to Specification.*

Heating gases.—In an apparatus for drying by means of superheated steam, the exhaust steam therefrom is used for heating air for drying or other purposes.

13,328. Watkinson, W. H. June 15.

Thermostats.—A steam superheater is arranged so that the flow of the combustion products through it may be regulated by means of a damper N. The damper N is controlled as shown in Fig. 9 by the pressure of a liquid in the tube *i* in the header. The temperature of the superheated steam may be varied in accordance with the engine cut-off by means of a supplementary governor and worm and chain wheel.

**13,716. Opawski, A., and Murmann, E.** June 20.

Heating by chemical action.—Cans for canned goods are provided with means for heating their contents. Heat is developed by the interaction of water and lime. In order to expedite the action, a third substance, such as chloride of calcium, is mixed with the lime or with the water. Other substances instanced are chlorides, bromides, iodides, and nitrates of calcium, magnesium, ammonium, and zinc. The lime and the water are placed in two sealed chambers *c* and *f*, which are attached to the top of the can *b* by their flanges *f*¹, *c*². The two chambers are put into communication by forcing down the curved top *h*, the cap covering the hole *f*² in the bottom of the chamber *f* being broken away by the pin *j*.

13,409. Mould, W. D. June 16.

Heating water.—Reference is made to Specification No. 7917, A.D. 1896. The bath shown in Fig. 1 has the bath 5 and heater 6 in combination. The intermediate water chamber 7 provided above the fire is covered by the perforated false bottom 8, which is removable, and may be made to cover the entire bottom of the bath. The casing 10 is

13,778. Francis, J. J., and Francis, I. C. June 21.

Boiling-pans.—Relates to a washing-machine with which are combined a stove and a wringing-machine. Fig. 1 shows a perspective view with the lid raised. The washing-tank A is formed with a sheet-metal bottom above which is a removable perforated wooden one. The partition a^2 divides it into two compartments, one A² heated by two burners b^1, b^2 for boiling the clothes, and the other heated by only one burner b for washing. The heater B is provided with a drip tray m , and is supplied with liquid hydrocarbon from the reservoir o^2 through the piping o^1, o^3, o^4, o^5, n^1 having a swivel coupling N so that the heater may be turned underneath the tank A or may be brought out into the position shown, when it may be covered with the plate P and used for heating irons, cooking, &c. A gas stove, or an electrically-heated one, may be used in place of the one shown.

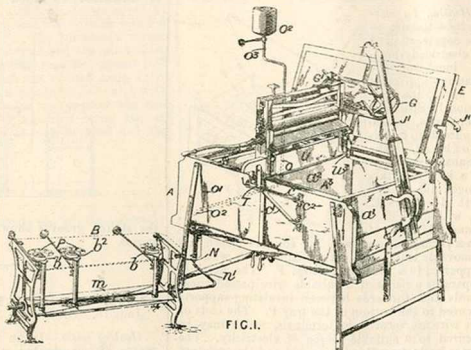
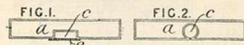


FIG. 1.

13,864. Corteen, W. D. June 22.

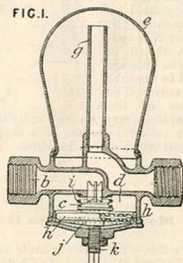


Heating buildings &c.—Relates to the construction of hot-water radiating tanks for propagators and the like. The tanks are heated by flues, one or more sides of which are formed from the metal of the tank. Figs. 1 and 2 show in section two examples of several tanks described in the Specification. In these Figures, a represents the tank and c the flue. In Fig. 1, a strip of metal e is employed to complete the flue. In all the examples shown, the flues are not entirely surrounded by the water of the tank.

14,031. Lamplough, F. June 24.

Steam traps.—The trap is shown in section in Fig. 1. At the inner end of the steam inlet passage b is the valve c supported on an expansible corrugated capsule or chamber h containing volatile liquid and pressed downwards by the

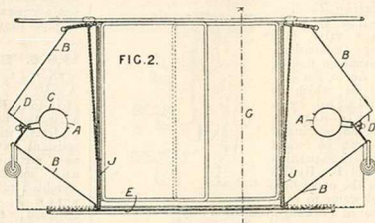
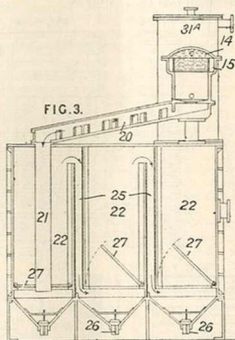
spring i . The water chamber d communicates with the metallic dome e , from which the discharge tube g conveys the water to the exit passage. The



bottom of the trap body is removable, permitting access to the interior, and the capsule support j can be raised or lowered by the adjusting-screw k .

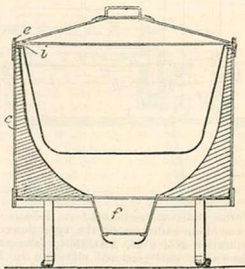
14,127. Dowsing, H. J. June 25.

Heating by electricity.—Relates to apparatus for utilizing radiant heat or light for medical and other purposes. The apparatus is shown in transverse section in Fig. 2. The incandescent electric lamps A are supported partly by their connection to the ends of the chambers B and partly by metal clips C secured to the angular reflectors D. The chambers are of metal or other suitable material, may have folding doors or flaps G and a cover-plate, and may be mounted adjustably on a base-plate E. The reflectors may be of the kind described in Specification No. 26,249, A.D. 1896. Screens J are provided between the radiating source and the space or part under treatment.

**14,228. Hinchliffe, W.** June 28.

Heating liquids.—Relates to apparatus for heating and purifying water for boiler feed, and other purposes, by direct contact with steam. Surface apparatus heated by steam and furnace gases is also described in the Provisional Specification. The water-purifying apparatus is applicable for the treatment of trade effluents. The water falls in a shower from the perforated bottom of a chamber 14, and meets steam which is admitted through the perforated inner wall of the annular chamber 15. A disinfectant or other purifying-reagent has previously been mixed with

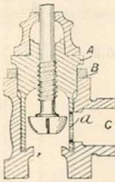
the water in a chamber 31^A, which is so constructed that the reagent may be introduced under pressure. The heated water runs down the inclined channel 20, which is provided with baffle-plates, into a series of settling-chambers 22.

14,238. Lede, W. June 28.

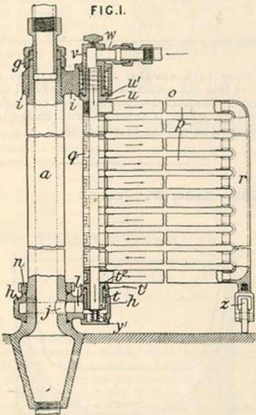
Boiling-pans or coppers are constructed with a flanged edge *i* resting upon a fireproof lining of the supporting T-iron *e*, to form a joint. The base or pedestal *c* is lined with firebrick or the like, and there is a firegrate *f* at the centre of the base, the products of combustion from which circulate around the boiler before escaping by an outlet pipe situated at a convenient part of the apparatus.

14,265. Kinnell, C. P. June 28.

Heating buildings &c.—The Figure shows a valve, for heating installations, the maximum flow of water &c. to the outlet C of which is regulated by a movable part A having an opening a which can be locked in any desired position by a nut B. By this means the equal flow of hot water to each radiator of a heating-installation may be ensured.



14,297. Brophy, M. M. June 28.

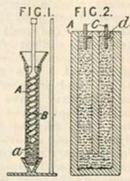


Heating buildings, radiators for. Relates to improvements in radiators of the type described in Specification No. 5146, A.D. 1894. The radiator is shown in part sectional elevation in Fig. 1. Upon the hanging post or pillar a two brackets h, i are carried, provided with sockets for receiving the hinge terminals u, t of the leaf o. Steam enters the radiator by a pipe w, and after circulating through the pipes p escapes by outlets l, j into the hollow pillar a communicating with the exhaust pipe. The brackets h, i are secured in place by nuts g, n pressed against suitable packing, and the non-return valve pressed upwards against the pipe q by a spring y. The sockets u, t turn in bushes v, t' screwed into the brackets, and the joints are made tight by packing u', t'.

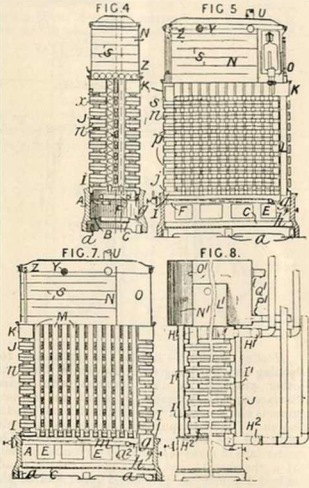
The leaf is partly supported by a roller z secured to the casing r, and if the radiators are arranged one above another the hollow posts are connected by pipes provided with expansion joints.

14,800. Sill, R. van R. July 5.

Heating by electricity.—A shell A, which may be of U-form, Fig. 2, having a circular bore, is filled uniformly with powdered resistant material a, such as a mixture of carbon and soapstone, by a weighted rotating feed-screw B, having a flattened end, so that the material is packed helically. Connections are made at the ends by inserting screws C with nuts d fitting the bore, and filling up with Babbitt metal. Such resistances may be used as radiators, and for other purposes.



14,823. Thompson, W. P., [American Incandescent Gas Co.], July 5.



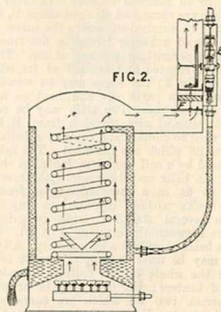
Heating air; heating buildings &c.; heating water.—Relates to apparatus in which air and

water are heated by gas jets, the apparatus serving as a radiator and the air, or water, or both, being circulated through pipes to be used for heating other apartments. Figs. 4, 5, and 7 show vertical sections of an apparatus, the base A of which stands on india-rubber feet *a*, *a* to prevent the transmission of heat. F is the burner, consisting of a perforated U-tube held against the gas inlets by a spring *a'*. Under the burner is a removable grating B supporting a pan C containing a reflector in which the burner can be seen through glazed openings E, E in the base. A pilot jet burns in a perforated metal cap for the instantaneous ignition of the burner F when the gas is turned on. The water-heater and radiator consist of a number of similar flat box-like sections J, J, a top section K, and a bottom section I. The bottom section tapers towards the drop-down *g*, which is provided with a draw-off valve *h*. It is connected to the lowest section J by a screwed thimble *j*, the two being screwed up till their bosses abut. The sections J, J are divided by diaphragms *n*, *n* extending across and from one end to near the other, and are connected by thimbles screwed into flanged openings *p*, *p*. The upper section K is connected by a thimble S extending to near the top. A pipe L screwed into the upper section passes through openings in the sections J, J, and is screwed into the lower section and made tight by a nut and washer. The water circulates upwards through the connecting-thimbles, and down through the pipe L. Pipes M, M, passing through openings in the sections K and J and resting on the bottom section over the openings *m*, *m*, convey the combustion products into an air receiver N divided by horizontal diaphragms S, S. From this receiver the air may flow out into the apartment by a regulator Y, or it may be conveyed into a heating-system by a pipe U. The compartment O contains a safety-device to prevent over-pressure in the water-heater. Openings Z, Z are made in one end of the receiver to admit air. Corrugated metal ribbons may be placed in the tubes M to retard the passage of the hot gases. A gas jet burns in the pipe U to induce a current in the right direction, and any vapour condensing in it is conveyed by a pipe to the pan C. In a modification, the heated water circulates through heating-pipes connected to manifolds H¹, H² as shown in Fig. 8. The pipes M, M are dispensed with, and the sections I, I are enclosed in a casing J through which the products ascend to the receiver L'. The sections are shortened at opposite ends alternately so that the products pass along their upper and under sides. From the receiver L' the products pass to a chimney. It is surrounded by an air-heating chamber N' divided by a vertical diaphragm O' separating the circulating-pipes P', Q'. The gas supply to a number of these heaters, distributed throughout a building, may be regulated by valves in a central station.

15,084. Simmance, J. F., and Abady, J.
July 9.

Heating water.—A coil form of water-heater or geyser is shown in Fig. 2. The burner may be of

the form described in Specification No. 294, A. D. 1897, or may be of any suitable form for petroleum, spirit, acetylene, or the like. The cold water enters and impinges as a jet upon the turbine B,

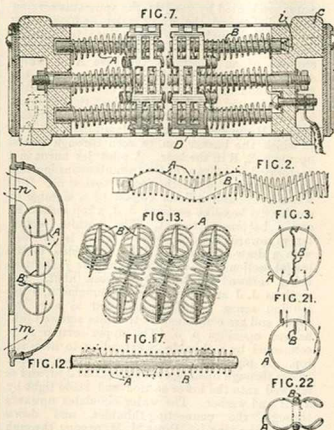


so driving the exhausting-fan F. In another form of heater, the heating-gases come in contact with the water, and the water jet acts as a jet or spray exhauster, there being no turbine and fan.

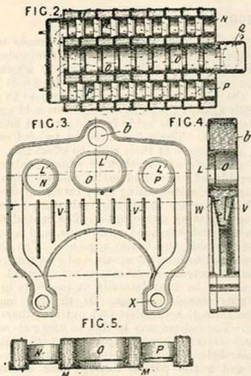
15,208. Gold, E. E. July 11.

Heating by electricity.—Heaters are made up of resistant resilient wire, coiled openly into straight or nearly-straight helices A, Fig. 7, which are placed on stiff longitudinal supporting-rods B, so that the helices are distorted and caused to press laterally against the rods, and are thus held against displacement, while being free to expand laterally when heated. The helices may be twisted on the rods, and secured at their ends, to effect this. The rods are made of porcelain or other insulator, or preferably of enamelled metal, and are supported within a perforated casing D by insulating-discs C, in which they are secured by asbestos packing, or setting in plaster, or springs *i*. The central rod is provided with threaded ends, nuts, and a spring washer, to hold the heater together. The discs C are recessed to hold terminals, and covered by end plates. Numerous modifications are specified. The helices may be bent laterally at intervals to grip the rods placed in them. Or the rod may be passed through some coils and outside others of a helix. The helices may be flat, to grip rods within them. Or two opposite parts of each coil of a circular helix may be bent inward until they overlap, and a rod passed through the overlapped parts. Or a helix may be made of small diameter at intervals to fit upon the supporting-rod, the intervening larger parts standing clear of the rod.

In other forms the rod is bent in a plane, or curved helically, Fig. 2, or provided with projections, Fig. 17, or projecting discs, to receive a straight helix, which may be secured at its ends in grooves or in notched washers. In other forms, the helices are sprung on straight strips B, Fig. 12, which may be notched to receive the turns. Fig. 12 is a section of a heater having a flat front, with grids *m, n* permitting passage of air. The strip may be corrugated and beaded at its edges, as shown in Fig. 3; the edges may be wired. The strip may have parts slit and bent on it to fit upon a central rod. The strip may be replaced by a flat frame of wire. Such a frame B, Fig. 22, may be used to contain and support a helix, opposite parts of which are indented. The helix may be replaced by a coil wound in loops, as shown in Fig. 22. A helix may be made with three indentations to fit in a three-sided wire frame. A circular helix without indentations may be held between several straight strips, or gripped at one part between three strips, Fig. 21. Fig. 13 shows a helix placed on a helical strip. A two-way switch may be used to supply current to either half or the whole of the coils in a heater or a series of heaters; the coils may be arranged in three series, two of which are connected permanently in parallel, so that a two-way switch may give three degrees of heating. Specification No. 20,923, A.D. 1897, is referred to.



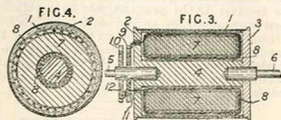
15,293. **Plenty, J.** July 12.



Heating water, boilers for. A sectional plan of the boiler is shown in Fig. 2, and detail views of

one of the sections are shown in Figs. 3, 4, and 5. Each section is formed in halves *L, M* fitting into each other and rendered water-tight by rust-joints or the like, and a number of these sections are bolted together as shown in Fig. 2, to form the boiler. Adjacent sections communicate by the orifices *X* below and *b* above. The hot gases and products of combustion rise up from the firegrate between the sections, and enter the side flues *N, P*, which they traverse from end to end, being afterwards deflected into the central flue *o* before escaping at the outlet *Q*. There are suitable inlet and outlet connections, and the sections have internal projections *V, W* to render the heating more effective.

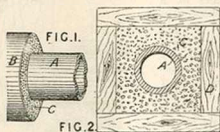
15,300. **Snow, F. P.** July 12.



Heating by electricity.—The Figures show an electrically-heated roller for drying fabrics or

paper, for calendaring and similar purposes. It consists of a cylindrical shell 1, of iron or other material of low conductivity, having ends 2 and 3 and a shaft 4 of copper or other good conductor of electricity. An annular core 7 of magnetic material is wound with an insulated conductor 8, the ends of which are connected to collectors 9 and 10, respectively, mounted on insulated discs 11 and 12, keyed to the bearing-piece 5, and connected with an alternating-current generator. The shell 1 increases in thickness towards the middle, to ensure its uniform heating by the secondary currents produced therein. The whole apparatus is rotated on its terminal bearing-pieces 5 and 6.

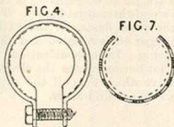
15,542. Archibald, J. July 15.



Non-conducting coverings and compositions.—Fig. 1 shows a method of protecting an indoor water supply pipe A by a thin metal casing B packed with ground cork, sawdust, flock, or like material C. For outdoor or underground use where a metal casing would be subject to corrosion, a wooden casing D is used as shown in Fig. 2.

15,546. Laverick, C. H. July 15.

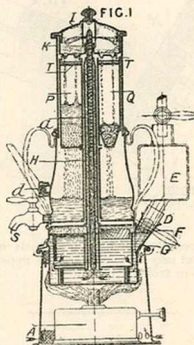
Heating water.—Relates to gauge-glass fittings for steam or other boilers. A shield of the form shown in section in Fig. 7 is supported around the gauge glass by means of clip supports with internal flanges, of the form shown in Fig. 4, which embrace the top and bottom gland nuts. When made of metal or other opaque material, the shield is formed with longitudinal slots as shown; but it may be of toughened glass or the like, in which case the slots are unnecessary.



15,855. Barbé, P. E. S. July 20.

Heating water.—Relates to an infusing-apparatus with which is combined a geyser for supplying the

boiling water. Two strainers P, Q, for containing coffee, tea, &c., are fitted in the upper part K of the apparatus, which is provided with a cover I. Below the strainers a receiver is provided fitted

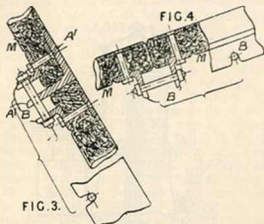


with a draw off cock S. A geyser G is fitted into the bottom of the apparatus. The right-hand section shows an open geyser with a float F, and the left-hand section a closed geyser. Water is also contained in a boiler surrounding and communicating with the geyser. A burner A is used as the source of heat, and is supplied with air through holes in the casing, which holes may be covered with metallic netting. Water is introduced into the boiler or geyser through the branch D or the water gauge E. When the water boils, it is projected up a central tube H, and issues in a series of jets through holes into an upper chamber, from where it filters through the perforations T into the strainers. The tube H is enclosed by a tube a. A window (or windows) d of glass, mica, &c. is fitted into the receiver for the purpose of ascertaining the height of the liquid therein. The parts in contact with the liquid are constructed of or lined with enamelled sheet metal or glass. The various parts are fitted with stops to retain them in position.

16,121. Stallybrass, W. S., and Cope-land, H. July 23.

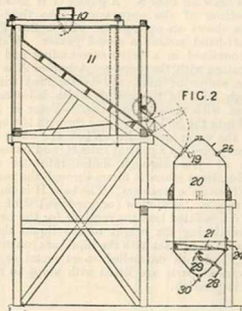
Non-conducting coverings.—Relates to the securing of pads or mattresses of asbestos or other fibrous or flexible material upon boilers to prevent loss of heat by radiation. Fig. 3 shows the connection of two mats to an angle-iron A¹ of the boiler, and Fig. 4 the connection between two

adjacent mats. Each circumferential mat M has upon its ends angle-irons B which are bolted to the angle-iron A' of the boiler. The coverings are



more especially for the lower parts of marine boilers, but may be applied to the upper parts or the backs or fronts.

16,244. **Watts, T.** July 26.

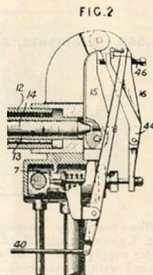


Digesters.—Relates to improvements in fish-offal digesters, and in means for supplying offal to the same. Fig. 2 shows a vertical section through one digester and its tank. The endless conveyer 10 discharges the offal into a series of tanks 11, from which it is run into the digesters 20. Each digester 20 is provided with a sloping foraminous bottom 21, a door 24, a safety-valve, pressure gauge, and steam pipes 25, 28, the latter having a

baffle 29. When the digester is charged, the opening 19 is closed, and steam is admitted through the pipes 25 and 28 till the offal is cooked. Steam supply to the pipe 28 is then cut off and pressure increased through the pipe 25, and the mixture of oil, gelatine, and water in the mass is forced downwards and drawn off through the pipe 30. The residue is drawn off through the door 24, and may be further treated for use as manure.

16,482. **Ruud, E.** July 28.

Heating water; thermostats.—The valve regulating the gas supply to the burners of a water-heater for hot-water supply is under the control of thermostats, one of which regulates the temperature of the water, while the other cuts off the gas supply if the pilot burner is extinguished. The first consists of a tube 13 and rod 14, having different coefficients of expansion, and enclosed in a tube 12



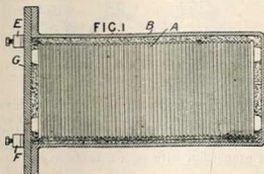
in circuit with the water-heating coil and exposed to the heat of the main burners. The rod 14 actuates a system of levers 15, 16, to control the gas valve 7. The lever 16 has pivoted to it a lever 44, through which it is connected to the valve spindle, and which is normally held in position by a trigger 46 engaged by a lever connected to the second thermostat bar 40. This last passes through the pilot flame, on the extinction of which the trigger 46 is released and the valve 7 closed by a spring. In a modification, the extinction of the pilot burner causes the closing of a supplementary valve which cuts off the supply to both the pilot and the main burner.

16,595. **Lyon, H.** July 30.

Heating by electricity.—A rectangular or cylindrical block A is moulded with a continuous groove, from a mixture of fireclay and lampblack, and fired. The groove is filled with a mixture of carbon, vegetable fibre treated with sulphuric acid, lampblack, blacklead, and sugar, and baked, a resistant conductor being thus formed. Or a resistant metal wire may be wound in the groove. The ends are connected to terminals E, F on a plate G, and the resistance enclosed in a steel casing B. The

spaces are filled up by evaporating brine in them, or with a mixture of silicate and carbonate of soda

16,598.

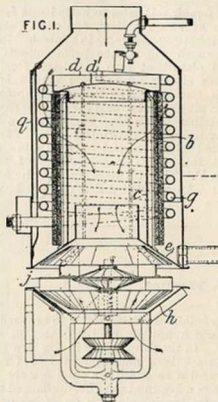


and either lampblack, mica, or talc; or mica or talc alone may be used.

16,598. Hoffmann, O. July 30.

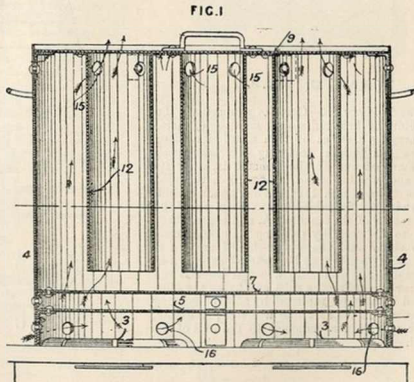
Heating air.—Air from the exterior of a workshop or other building is drawn in by a fan *j* and mixed with a current of air drawn from the room. It is warmed by contact with steam pipes *g*.

(For Figure see next column.)



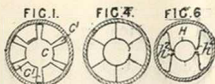
16,713. Tourville, C. B., and Tully, M. Aug. 2.

Heating air; heating buildings.—Fig. 1 shows a drum 4 for placing over a gas stove for heating rooms by radiation and convection. The drum is preferably elliptical in cross-section, and has perforated plates 5 and 7 near the bottom, the holes in the first being arranged out of line with those in the second. A removable perforated cover 9 has depending hollow cylinders 12 having apertures 15 near their top ends. Apertures 16 are also formed in the lower peripheral portion of the drum, to supply air to the burners 3 and to promote circulation. The directions of the air currents are shown by arrows.



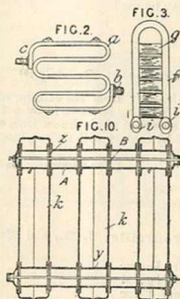
16,833. Mackay, J. R. Aug. 3.

Heating liquids.—Relates to baffle liners for the fine tubes of steam boilers, feedwater-heaters, and tubular heating-apparatus in general. In the form shown in Fig. 1, the baffle consists of a corrugated plate bent into cylindrical form, the corrugations closing up to form narrow hollow ribs. The farther end of the central space C is closed by a plug so as to force the gases to pass out by the narrow spaces C'. Fig. 4 shows a baffle formed by bending a flat-ribbed plate. The plate is perforated near the far end, which in this case also is fitted with a central plug, to allow the passage of gas from the central space to the radial spaces. A third form is constructed of two bent plates H, pressing against one another at their bent edges h'. The ribs or wings may be helically disposed, and the baffle may be conical instead of cylindrical. An inclined deflecting-vane may be used in connection with such a baffle.



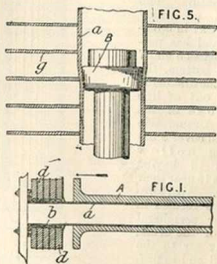
17,084. Maquet, C. Aug. 8.

Heating buildings &c.—Relates to heat-radiators through which hot air or hot water or steam circulates. In the form shown in Fig. 2, a pair of flat plates are bent and connected to form the hollow vessel a to which the pipes b, c are fitted. Fig. 3 shows a heating-tube f having flanged ends i, and supports heating-plates g on either or both sides. In another modification, Fig. 10, the tubes k contain perforated tubes y which are separated by hollow distance-pieces A, and communication between the different chambers formed is effected through the apertures z. The whole is secured by the bolts B.



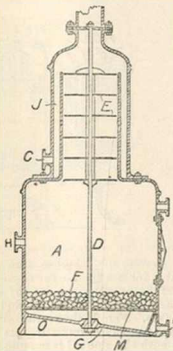
17,085. Maquet, C. Aug. 8.

Heating buildings &c.—Consists primarily in the manufacture of heat-radiators consisting of metal tubes carrying a series of thin metal gills. For fixing the gills without soldering or brazing, each gill g, stamped out of sheet metal, is, after its central aperture has been burred out, threaded upon the tube a, Fig. 1, supported on a mandrel. The burr is then forced back into the plane of the ring by means of the mandrel A, and the gill thus secured to the tube by gripping. Between each gill the stay b and the scissor-shaped anvil d is placed. The process may be reversed as shown in Fig. 5, and a mandrel with a coned head B employed for expanding the tube and fixing the gills. The head B may be replaced by an inclined ring which turns on its axis like a screw; the ring, however, may be perpendicular to the axis of the mandrel.



17,139. Gascoigne, A. Aug. 9.

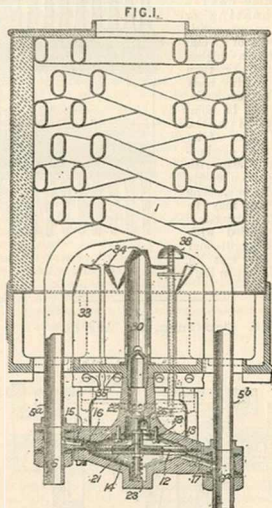
Heating water.—The Figure shows a combined water-heater and filter. The strainer M arranged over the inclined bottom G has coke or other filtering-material F placed upon it. The water to be treated is admitted through the inlet C to the chamber J, and flows on to the plates E arranged on the rod D and mixes with live or exhaust steam in the chamber A. The hot water then filters into the chamber O, and escapes through the outlet I.



17,285. Miller, W. L., and Simpson, H. P. Aug. 10.

Heating water.—Cold water entering through the pipe 6 circulates through the coil 1, which is heated by the gas burners 34, and is drawn off through the pipe 6^a. The ends 5^a, 5^b of the coil are circular, while the remainder is preferably elliptical in cross-section. There is a burner tube 30 arranged in the centre of the ring of burner tubes 33, and all of these have crescent-shaped burners 34 and air-supply openings 35. The gas valve 22 is carried by the spindle 21 attached to the diaphragms 12, 18, the latter of which separates the gas chamber 25 from the upper water chamber 13, which is in communication with the inlet by means of the pipe 6, port 15, and very small channel 16. The lower water chamber 14 is connected to the outlet pipe 6^a by the unrestricted

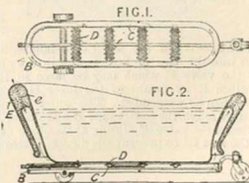
port 17, and unlike the upper chamber 13 is subjected to the sudden variations in pressure. When no water is being drawn off, the valve 22 is closed by the spring 23, and the differential water pressure on the diaphragms 12, 18. When hot water



is being drawn off, the pressure in the chamber 14 falls, and the practically constant pressure in the chamber 13 presses down the diaphragm 12, opens the valve 22, and supplies gas to the burners, which are lighted by the pilot burner 38. In a modification, a piston is substituted for the diaphragms.

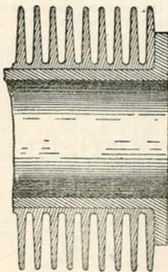
17,305. Walter, C. Aug. 10.

Heating water for baths. Fig. 1 shows a plan of the heating-apparatus, and Fig. 2 an elevation of the bath complete. A gas pipe C is coiled on the top of a trolley B, upon which the bath is placed, asbestos packing D being interposed. The ends of the bath are bent over to form spaces for the circulation of the products of combustion, which ultimately escape by the pipe e. The space E is filled with some non-conducting packing. In a modification, a fire is lit on a small trolley placed in a chamber formed at the bottom of the bath. When not required, the trolley is run into a second chamber communicating with a flue.

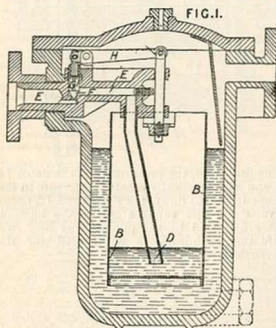


17,438. Ayton, R. C. Aug. 12.

Heating buildings.—A conducting covering or heat-radiating device for heating or cooling purposes is formed of metal having a higher conductivity than the radiating body which it surrounds, and may be combined with the cylinder of an internal-combustion engine or with tubes of condensers or radiators. The covering may be plain, corrugated, or provided with wings or gills, and may be cast in position upon the body.

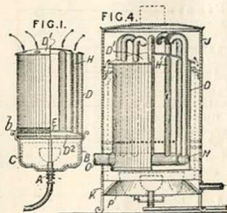


17,796. Cockburn, R. Aug. 18.



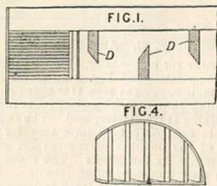
Steam traps.—When the water of condensation overflows into the pan or float B, the float sinks, opening the valve F, which may be large, in the outlet orifice E by means of the lever H from which the pan is suspended. The water is then driven out through the outlet pipe D and orifice E by the steam, the valve F closing at its upper end against the seat G¹ to prevent the escape of steam.

17,887. Spencer, J. T. Aug. 19.



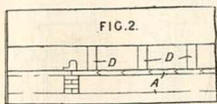
Heating air; heating water.—Relates to apparatus for heating air for rooms, or water for baths and other purposes, by the employment of the waste heat from gas, oil, and other burners and stoves. Fig. 1 shows the air-heating apparatus applied to an illuminating gas burner. The frame B with the globe C is mounted upon the burner A. The heating-chamber D, having a dome-shaped cover D¹, and bottom D² with central aperture E and tubes H extending from top to bottom, rests upon the frame B or is suspended above the burner by a hook. Wire gauze b may be provided at the lower end of the chamber D. Fig. 4 shows a geyser for use with gas or oil burners or oil lamps. In this arrangement, the chamber D is preferably enclosed by a casing J standing upon feet K so as to provide space for the burner and globe if required, the chamber being supported by projections and lugs as shown. The water enters the copper or other ring N by the supply pipe O, and being heated rises in the pipes H¹, from which it is discharged on to the top or cover D, and thence to the annular trough P, from which it is withdrawn.

17,939. Chapman, W. Aug. 20.



Boiling-pans.—For consuming smoke, and utilizing the heat of combustion in the flues of

steam boilers, coppers, and the like, fireclay baffles *D* with louvred plates are arranged as shown in the case of a steam boiler, being supported on a

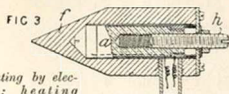


longitudinal horizontal division plate *A*. Fig. 4 shows an enlarged perspective view of one of the baffles.

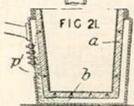
18,156. Vogt, A. Aug. 23.

Heating by electricity.—Resistances are made from a mixture of a conductor and a non-conductor, finely divided, converted into a paste with water, cast or moulded to any desired forms, dried, embedded in powdered carbon in a closed or nearly-closed receptacle, and heated to a high temperature. The conductor may be a mixture of carbon and a metallic powder, in order that the resistance may vary little with temperature. The metal may be produced from a silicide or other compound added to the mixture, and the carbon from tar, sugar, cellulose, or other carbonaceous material; when tar or asphalt is used, it is mixed hot with the non-conductor. The non-conducting material may be any artificial stone, magnesia, or other like material. Specification No. 15,238, A.D. 1897, is referred to.

18,231. Bachmann, J. F., Vogt, A., Weiner, C. C., König, A., Kirchner, J., and Jörg, A. Aug. 24.



Heating by electricity; heating buildings; heating liquids.—Resistances made by moulding and firing mixtures of carbon or divided metal with non conductors such as clay or porcelain,

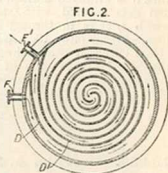
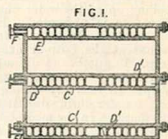


as described in Specifications No. 15,238, A.D. 1897, and No. 18,156, A.D. 1898, are used in two forms for heating bodies from within and without, respectively. The resistances are insulated by air, or by glazing or enamelling, or by heating electrically to whiteness so that the carbon on the surface burns out, after which the surface is coated with solution of aluminium sulphate or

other suitable material, and heated. Fig. 3 illustrates a soldering-iron *f*, which contains the cylindrical resistance *a* provided with connecting-rings on its ends, and with a metal screw *h* for short-circuiting more or less of it to regulate the temperature. Flat irons, ironing-rollers, and singeing-apparatus may be heated similarly by enclosed tubular resistances. The insulating-coating may be on the inner surface of the iron. Tubular resistances with end connections may also be used for heating curling-tongs placed in them, or liquids passed through them. In other apparatus, such as the crucible shown in Fig. 21, a vessel *a* is made of the resistant material, with grooves to receive conducting-wires *b*, which are embedded in non-conducting material, before the glazing, and which can be connected in various ways by switches to regulate the heat produced by current passing through the material from one or more wires to others. The resistant body may be surrounded by an air-jacket *p*¹, or non-conducting material, to reduce loss of heat. In place of the wires, the surfaces of the resistant body may be coated with metal, and the coatings connected by spring clips or otherwise to supply conductors, so that the current passes directly through the thickness of the resistant material. Heaters to be placed in liquids, boilers, air-heating and other stoves, floors, walls, and ceilings of buildings, and hot-plates, baking-dishes, and other cooking-apparatus may be constructed similarly.

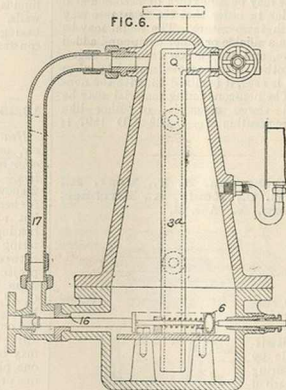
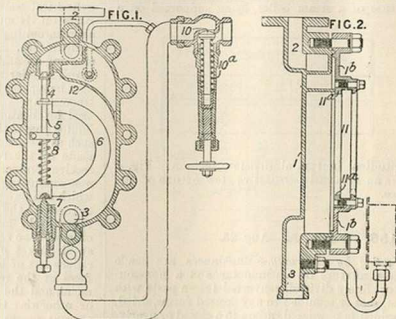
18,234. Huber, C. Aug. 24.

Heating by steam, air, and water or other liquid circulation.—Figs. 1 and 2 show a chamber for heating. Steam, hot air, or other heating fluid entering at *F* passes between the spiral projections *D*, *D*¹ from the plates *C*, *C*¹, which also have grooves *E*, to the outlet *F*¹. Both spiral projections may be carried by one plate, or only one projection may be used, the other being replaced by a radial discharge pipe on the underside of the plate *C*. In other modifications, the fluid is caused to pass in a zig-zag path; in the case of a square chamber a zig-zag rib and inter fitting straight ribs are used, while in a circular chamber a radial and a number of concentric partitions are used.



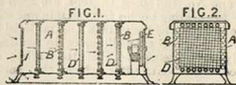
18,278. Brooke, R. G. Aug. 25.

Steam traps.—The hot-water inlet 2, Figs. 1 and 2, is controlled by a conical valve 4, the spindle 5 of which is fixed to one end of a curved expansion tube 6. The other end of the expansion tube is pressed against an adjustable stop 7 by a spring 8. The expansion tube is filled with petroleum spirit or other volatile liquid. To enable water to collect inside the steam trap, the outlet 3 is controlled by a loaded valve 10, which can be regulated to blow off at any pressure by means of the screw 10'. The trap is provided with a water gauge consisting of a glass strip 11 held by a frame 11'. Water trickles into the trap through the inlet valve and, becoming cooled by radiation, the expansible tube contracts, opens the valve, and allows an inrush of water and steam to take place. The resistance of the exit valve is overcome, and the contents of the trap are discharged, so exposing the expansible tube to steam, which expands it and thus closes the inlet valve, so that the operation can be repeated. The upper part of the trap is narrowed by the partition 12, so that any boiling up of the water during discharge is prevented. In a modification, the exit valve is placed at the bottom of the trap. In another modification, the casing of the trap is cone-shaped, so that any boiling up of the water during discharge is prevented. In the modification shown in Fig. 6, the expansible tube 6 is arranged horizontally and gets covered with water which trickles in through the loose-fitting bush 16. When steam enters, it passes through the pipe 17 to the top of the trap, and discharges the contents through the pipe 3'.



18,285. Greville, A. E. Aug. 25.

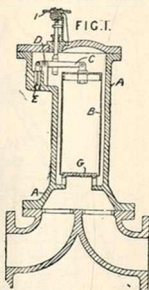
Heating air; heating by electricity.—Relates to electrical air-heaters for warming rooms or chambers or for baths. The apparatus comprises a receptacle A containing a series of frames B carrying resistance wires D heated by an electric current, and means such as a fan E for inducing a current of air to pass through the apparatus. A perforated



screen I may be provided at the air inlet. In a modified form, the receptacle is arranged vertically, the air inlet being at the bottom and the fan or propeller at the top.

18,528. Cockburn, R. Aug. 30.

Heating water; steam traps.—Relates to apparatus for separating air from heated water, applicable in connection with feed water heaters, steam traps, and like apparatus. Fig. 1 shows the apparatus as applied to a line of piping. For connection to a feedwater-heater the casing A is modified slightly at the lower end so as to constrict the opening. Within the casing is fitted a float B, open at the lower end and suspended at its upper closed end from the end of the lever C pivoted at D and attached to the air-escape valve E, which closes on the rising of the float B to prevent the outflow of water. The hand-wheel I may be provided for closing down the valve E by hand upon its seat to prevent the escape of air. The grid G, provided near the bottom of the casing A, breaks up the inflowing water, so causing it to part with its air.



18,694. Bataille, J. C. E. Aug. 31.

Heating liquids.—Relates to a process and apparatus for use in extracting and decolorizing

18,696. Wezel, J. Aug. 31.

Heating water.—Steam and other boilers are constructed with water chambers of special form arranged to enclose the furnace and flues. Fig. 6 shows the application to a water-tube steam boiler. The transverse chambers shown in section communicate at each end with flat side chambers extending the whole length of the boiler. A similar arrangement may be applied to a cylindrical boiler.

fatty bodies, and especially refers to the oil extracted from seeds and fruit by volatile solvents.

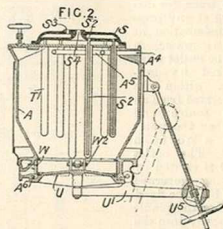
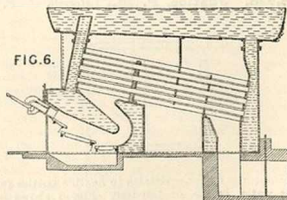
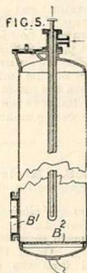
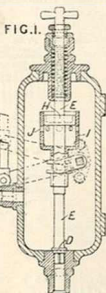


Fig. 2 shows a vertical section of one of the extractors. The vessel A may be jacketed or not, and is provided with covers S and U at top and bottom. Steam is conveyed to the opening S¹, passes down the tube T¹ and up the pipes S², and is conducted away from the outlet S³. The annular extension A⁴ is provided with a filter W consisting of a band of perforated metal or wire gauze covered with fabric and held in position by a double-threaded tension screw W². Fig. 5 shows a vertical section of one of the decolorizers. It is provided with a perforated false bottom B², a manhole B¹, and a steam heating-tube T¹.



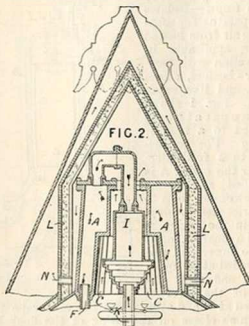
18,926. Royle, J. J. Sept. 3.

Steam traps.—Relates to traps, for discharging at any pressure condensation or priming water, in which the outlet valve is worked by mechanism within the trap operated from an outside source and only when the water reaches a certain height. The outlet valve D is carried by the spring-governed spindle E. The fixed piston H on the spindle E fits loosely into the cylinder I, which is caused to reciprocate by means of external mechanism and has openings J to allow the water to flow from the casing into it. Owing to the piston fitting loosely within the reciprocating cylinder, the outlet valve is only opened when the water flowing into the cylinder is interposed between the piston and cylinder. By connecting the cylinder to the valve, the piston may have the reciprocating motion.



the ordinary bag A. An outer or enclosing airtight expansible bag B, connected to the bag A by stays of tape or other material, has an air tube whereby it may be inflated. The outer bag may be corrugated, and may have attaching-straps at its ends.

19,097. Scott, W. Sept. 7.

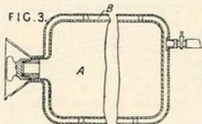


Heating liquids.—Relates to apparatus for heating and evaporating liquids, applicable for heating water and for steam generation by means of heat from bunsen and luminous flames produced either from gas, oil, or fuel. The apparatus is shown in sectional elevation in Fig. 2. The evaporator or superheater I is cylindrical in part and conical or stepped in part, and is surrounded by the annular water chamber A. Vertical ribs C for retaining the heat from the flames or burners fixed below are formed upon the inner wall of the water chamber. The water chamber or generator, the conducting-pipes, and the evaporator or superheater are screwed together as shown. A metal casing or hood L enclosing non-conducting material and an outer or weather hood are provided. The products of combustion escape by the passages N to the external atmosphere. Feedwater under pressure is supplied by the pipe F, and the steam is conveyed by the pipe K into coils or pipes immersed in a cold-water tank or through pipes for radiating heat by means of steam or hot water.

18,858. Accles, J. G. Sept. 3. Drawings to Specification.

Heating buildings, radiators for. Cylinders or chambers having heat-radiating ribs have their ribs made separate and attached to them during casting. Or, if the ribs are of a more fusible metal than the cylinder, such as copper, the parts may be embedded in a mould and united by some metal as fusible as the ribs, such as aluminium.

18,928. Justice, P. M., [Morrill, J. F.] Sept. 5.

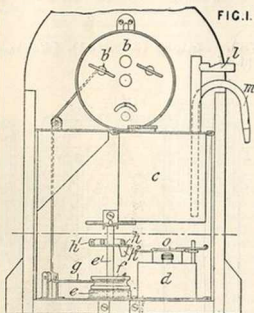


Hot-water bottles.—Relates to flexible bottles for hot water, or ice, or the like. Fig. 3 shows in longitudinal section a form of bottle for containing liquid or cracked ice. There is an ordinary filling-nipple closed by a screw cap or plug attached to

19,233. Perry, J. Sept. 9.

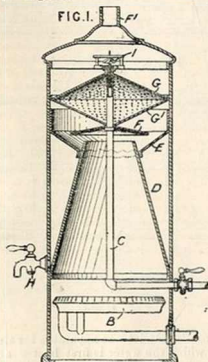
Heating water.—Relates to apparatus for obtaining a supply of hot water at any predetermined time. The driving-spring of an alarm clock b is removed, and the winding-arbor b' is connected by a cord g to a pulley f upon the vertical arbor c' of a spring drum e, which is accordingly initially wound up

and runs down at the time predetermined as for an alarm. A disc *h* upon the vertical spindle bears two converging pockets *h*¹ on the upper side and the lug *h* on the lower side. As the spring turns



the spindle, the lug *h* sweeps aside the swivelling wick-guard *o* of a lamp *d*, and matches placed in the sockets ignite the lamp after passing a striking-plate. The lamp boils water in a vessel *c*, and the steam sounds a whistle *l*, while it expels the water through a pipe *m*.

19,252. **Thompson, W. P.**, [Humphrey, A. H.]. Sept. 9.



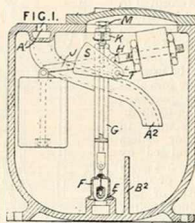
Heating water.—Relates to water-heaters for baths or similar purposes. The water enters the

heater by the pipe *C*, and is distributed over the conical surface *G* by the sprinkler *I*, and descending through the perforations in the surfaces *G* and *G*¹ on to the surface *F* falls down the outside of the cone *D*, to be drawn off at the cock *H*. The gases from the burner *B* pass up through the cones *D* and *E*, and through the perforations in the plates *G* and *G*¹, where the water is heated by contact with the gases, to the flue *F*¹.

19,368. **Whittaker, J.** Sept. 12.

Heating liquids.—Relates to a water boiler for domestic and other purposes, provided with a non-conducting covering of earthenware or the like. A metal lining is fitted into the non-conducting casing, preferably cylindrical in shape, and held by a flange at its upper extremity resting on the upper edge of the casing. The cover for the boiler has a vertical tube attached to it and communicating with the flue, and provided with a damper or steam regulator. This damper may be operated by hand, or automatically by the rising steam. By this means the emission of the steam may be controlled.

19,415. **McDougal, I. S., Sugden, T., and Haigh, N. N.** Sept. 12.



Steam traps.—Relates to traps of the type described in Specification No. 12,388, A.D. 1890, and consists generally in so constructing the working mechanism that it can be fitted together outside of the body of the trap, and then placed in position in the casing. Fig. 1 shows the trap with the working parts in position. A vertical strut *G* has its lower end fitting on the flange *E* of the valve casing *F*, while its upper end, in the bearings *H*, carries the pivot upon which the float lever *J* swings. The upper cross-bar *K* is removable, and receives the set-screw *M* which secures the working mechanism in position. From the inlet *A*¹ the pipe *A*² conducts the water so that it flows into the pocket formed by the partition *B*², in order that dirt or débris may be trapped and prevented from clogging the valve. The catch-piece *S* with

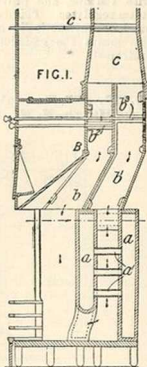
projecting pins T is worked from the outside by a hand-wheel, so that the valve may be lifted from or forced on to its seating.

19,486. Thompson, W. P., [Anderson, V. D.]. Sept. 13. *Drawings to Specification.*

Heating air.—Air, for use in a drying-apparatus, is heated in a chamber divided by longitudinal and transverse partitions, the former being alternately secured to the top and bottom of the chamber to cause the air to take a circuitous path between steam pipes, a series of which is provided in each section formed by the transverse partition, so that the heating in each section may be regulated separately.

19,623. Funnell, W. Sept. 15.

Heating water.—Relates to improvements in the apparatus described in Specification No. 18,568, A.D. 1895, in which the back of an ordinary open fire-place or stove is utilized as a boiler for a water-heating system. According to the present invention, the boiler may be divided into two or more sections, one of which may be used to supply water for culinary or like purposes. Further, the temperature of the water in the boiler or boilers can be regulated by directing the hot gases through one or other of a number of passages or flues leading to the chimney. In the arrangement shown in Fig. 1, the gases can be directed through the passage *b* or through the passage *b'*, or through both simultaneously, by suitably manipulating the dampers *b²*, *b'²*. These passages are formed by metal plates, preferably put together without bolts or studs, and lead into a hood *C* provided with a draught regulating damper *c*. A pipe leading into one of these passages is used to promote an air current in the apartment in which the stove or fireplace is situated. The boiler *a* shown is traversed by a single flue *a'*, but any desired number may be arranged, the number of passages in the fitting *B* being made to correspond.



19,671. Richards, T. P. Sept. 16. *Drawings to Specification.*

Heating air.—Air is heated in tubes surrounded by a casing through which steam is passed

19,782. Maiche (Limited), [Maiche, L.]. Sept. 17.

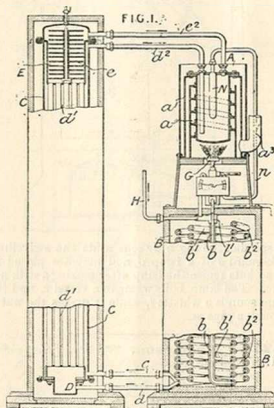
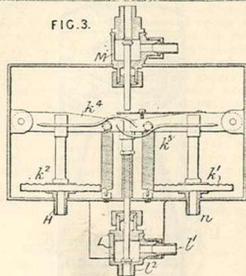


FIG. 3.



Thermostats.—Relates to apparatus for sterilizing water, in which the water is first heated and then cooled, such as that described in Specification No. 5007, A.D. 1897. The gas supply for the burner *G* passes through a similar valve-box *M*.

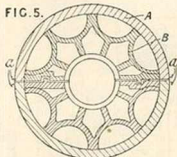
Steam generated in a closed vessel N in the heater A passes by a pipe *n* to a vessel *K*¹, moving a corrugated elastic diaphragm so that the lever-arm *K*² adjusts either the gas, or the sterilized water, outlet. The elastic diaphragm of the vessel *K*², connected to the water supply pipe H, similarly moves a lever-arm *K*⁴ and adjusts the valve in the box L. Wires attached to the arms *K*², *K*⁴ pass over graduated scales.

are put together, being provided alternately with tongue and groove, and tightened by means of a thin metal wire drawn over hooks *a*, placed on their upper surfaces. Each insulating-body consists of three

19,843. Noltemeier, C. Sept. 19.

Non-conducting coverings and compositions.—Relates to the composition of a heat-insulating material, and to various forms of slabs, sleeves, and bricks suitable for heat insulation, or for deadening sound. The slabs, sleeves, or blocks are formed with air chambers or cavities. The material used for the hollow insulators is formed by boiling paper and pieces of asbestos in alum water, crushing the mixture, extracting the water, mixing with soluble glass and chalk into a firm paste, and finally moulding under great pressure into the requisite shape. Fig. 5 shows a form applicable to the insulation of a tube or pipe. Two semi-cylindrical sleeves

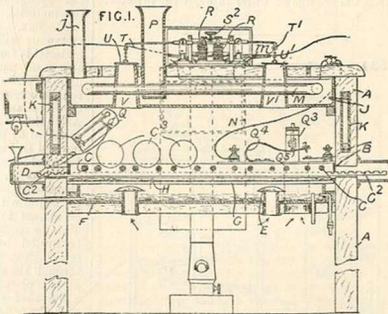
FIG. 5.



parts, an outer cover A, an internal wall B, and a sheet of asbestos attached to both at their lower parts by soluble glass. The air cavities mutually covering each other, and enclosed by insulating material, afford a stationary air insulation. The slabs may be used for insulating boilers or cylinders, and for deadening sounds in floors, walls, and ceilings; and the bricks for constructing arches of vaults or cellars, tunnels, ice-chambers, and other rooms requiring heat-protection.

19,898. Willcocks, J., and Smith, J. M. Sept. 20.

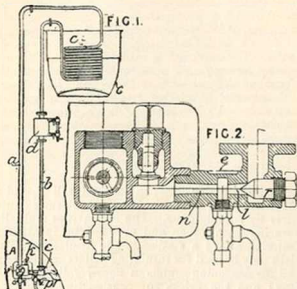
Thermostats.—A temperature-regulating device is combined with an incubator. Electro-magnets R, placed in circuit with a battery, are adapted to engage levers or rods *S*¹, *T*, *T*¹ carrying dampers U, U¹, &c., which normally close the tubes V, V¹ communicating with the incubator chamber and also close a passage to the hood *m*. When the circuit is closed, the magnets lift the dampers and allow the heated air to escape from the chamber. Two devices for closing the circuit, when a pre-determined temperature has been reached, are shown. In one case, a mercury thermometer Q is employed in which the mercury makes contact with the battery lead when the limiting temperature is reached. The other device consists of an expansible spring or joint Q¹ provided with a terminal Q² which makes contact with a strip attached to the battery lead at the limiting temperature and so closes the circuit. The spring Q¹ is adjusted to the required temperature by means of a spring Q³ attached to an adjusting-screw.



20,238. Hall, J. Sept. 24.

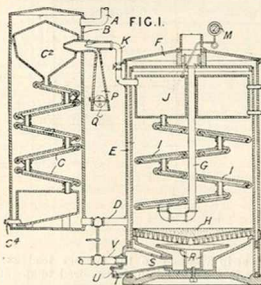
Boiling-pans; heating liquids.—Steam heating-apparatus for heating and boiling beer and other liquors is shown in Fig. 1. A pipe *a* leads steam from the boiler A to a coil *c* or jacket in the brewing

or heating-pan C, which contains the beer or other liquor. The condensed steam passes into a receiver *d*. When sufficient water has collected in the receiver, the cock *p* is momentarily opened, to



enable the column of water in the pipe *b* to attain sufficient velocity to pass through the injection tube *e* and check valve *k* into the boiler. The injection tube *e*, as shown in Fig. 2, has receiving and delivery cones *l*, *n*, and a regulator *r*, which controls the passage of water through the injector.

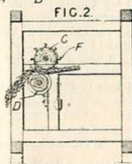
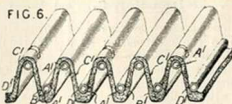
20,534. McCartney, J. Sept. 28.



Heating water.—Comprises apparatus for heating water which can be used either separately, or in conjunction with a condenser, so as jointly with it to form a distilling-apparatus. Fig. 1 shows a form of the invention in which heating and condensing chambers are seen in vertical section. The

heater consists of an outer water jacket *E*, to which water is supplied by a pipe *D*, and also a spreading-chamber *F* communicating with a series of zig-zag flattened chambers *I*, *I*, by a pipe *G*. The chambers *I*, *I* are heated by a gas heater *H*, and deliver into a reservoir *J* provided with the outlet pipe *K* and pressure gauge *M*.

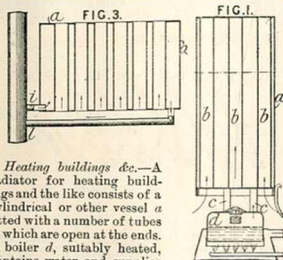
20,645. Maussner, E. K. Sept. 30.



Non-conducting coverings and compositions.—Relates to a fireproof material applicable as a covering for pipes, boilers, kettles, &c. among other purposes. In the production of the material, hair, tow, flax, moss,

rattan or willow fibre, asbestos, or other fibrous material is formed into a layer *D*. Fig. 1, between sheets of paper *B*, *C*, and arranged as shown upon a series of steam-heated pipes *A*' on heated rods or corrugated plates for the purpose of curling the fibres and giving them strength and elasticity. After this preparation, the fibres are interwoven or felted by passing the sheets between an oscillating roll *D*, Fig. 2, provided with a series of circumferential grooves *E*, and a roll *C* bearing needles or hooks *F*. Grooved boards, wire netting, or chain-work may be substituted for the roll *D*, and, to facilitate the felting operation, the roll *C* may be caused to rise and fall as well as to rotate. Two or more layers of the fibrous material may be united by the interlacing of the fibres, the hooks drawing the fibres of the lower layers through the upper ones. The felted material may now be placed in position, and then be coated with a fireproof composition, or it may be saturated with the composition and be pressed or moulded. Wire netting may be introduced into the sheet in the course of manufacture to strengthen it. The fireproof composition employed may be of any well-known kind. The following materials are mentioned as constituents thereof:—Sawdust, blood albumen, ashes, slag cement, pulverized slag, india-rubber, gutta-percha, cork, woollen or cotton fibre, linseed oil, varnish, sulphur, chalk, zinc white, zinc chloride, white lead, gum-lac, paste, pulped waste paper, asbestos fibre, pulverized fluor-spar, or dolomite, clay, pulverized glass, bone,

wax, oil, pitch, turpentine, water-glass, and glutinous substances.

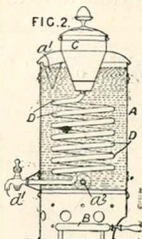
20,758. Royer, E. Oct. 1.


Heating buildings &c.—A radiator for heating buildings and the like consists of a cylindrical or other vessel *a* fitted with a number of tubes *b*, which are open at the ends. A boiler *d*, suitably heated, contains water and supplies steam through the pipes *c* to the vessel, in which it circulates. The condensed steam passes back into the boiler, which is provided with a safety-valve. In a modification, adapted for heating houses, barracks, hospitals, hotels, &c., the radiator *a*, Fig. 3, is connected to a steam pipe *i*, to which any number of radiators may be connected. After circulating through the radiator the steam passes into the return pipe *l*. Aromatic substances may be placed in the tubes of the radiator, so as to aromatize the air passing through the tubes.

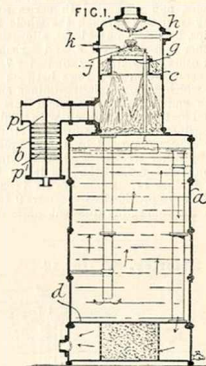
20,839. Rosethorn, T. Oct. 4.

Heating liquids.—An appliance for heating water, beer, wines, spirits, &c. for use in public-house and hotel bars consists of a boiler *A*, heated by a gas burner *B* and containing water, which is admitted through a funnel *a'* and which is withdrawn as required through a tap *a''*. A coil *D*, made of block tin, is connected at its upper and lower ends to the cup *C* and cock *d'*, respectively. Beer or other liquid is placed in the cup, and is heated in its passage through the coil.

The Provisional Specification mentions the use of hot water and steam for heating the liquid in the coil, and of more than one coil fitted in the boiler.

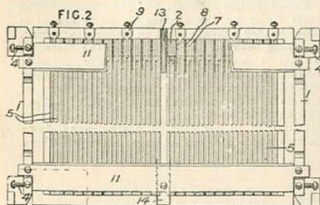

20,956. Pirwitz, L., and Behr, W. Oct. 5.

Non-conducting coverings and compositions.—The steam boiler or like surface to be protected is coated in such a manner that an air space is formed, on drying, between the surface and the material, so that a non-conducting protective covering results. The material is made by mixing 50 per cent. of carbonate of lime with 15 per cent. of chloride of manganese and 20 per cent. of a 3 per cent. chloride of calcium lye, and by adding to this mixture 10 per cent. of finely-ground down feathers, and 5 per cent. of large ordinary feathers.

21,289. Wright, W. J. Oct. 10.


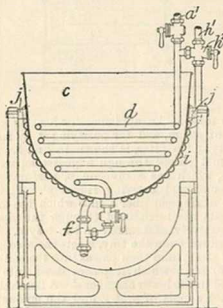
Heating water.—An appliance for heating water by means of steam, and for purifying it by means of reagents and a filter, is shown in Fig. 1. The steam is first passed through a grease-separating chamber *b*, which has a division *p*, perforated at its lower end and carrying ridges *p'*. It then enters the mixing-chamber *c*, into which the water and reagents are introduced through the pipes *h* and *k* respectively, and mixed in the tray *g*. The water overflows from the tray, meets the ascending current of steam, and then passes into the settling-chamber *a*, from which it passes down into the filter placed in the lower chamber *d*. A float valve *j* regulates the supply of water, and the amount of reagent supplied is proportioned to the amount of water filtered by means of an auxiliary pump driven from the pump which withdraws the treated water.

21,374. Raster, E. O. Oct. 11.



Heating by electricity.—A heating-resistance is built up of straight strips of carbon 5, separated by air spaces, and connected in series so that current may be passed through the whole length of the strips, by interposed blocks, alternately of glass or other non-conductor 8, and carbon, aluminium, or other non-oxidizing conductor 7. The strips are arranged in two rows between metal bars 2, 11, which have insulating-linings and are attached to end-pieces 1; the metal bars carry central metal partitions 13, covered with insulating-material, against which the series of strips are pressed by screws 4, carried by the end-pieces 1, and fixed by other screws. The series are electrically connected across the partitions 13 by aluminium bridges 14. Some of the interposed metal blocks 7 are provided with screws 9 to hold conductors for connecting different parts of the resistance.

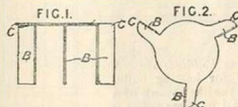
21,442. Brierley, W. Oct. 12.



Boiling-pans.—Relates to steam-heated pans for jam, confections, &c. The pan *c* is made of aluminium, and is supported on solid trunnions *j*.

Two coils are employed, one *d* within the pan and the other *i* surrounding it. The latter is flat-sided, and is held in place by passing round the trunnions, or is riveted or otherwise attached to the pan. The inlet *h*¹ is connected by a flexible tube to a steam supply pipe, and a tap *h*² is provided to admit steam to both coils. Water for cooling may be supplied through a flexible tube attached to the inlet *a*¹. The pipe *f* forms an outlet for steam or water.

21,827. West, C. H. Oct. 17.

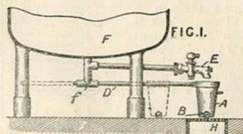


Heating-apparatus.—An impeder, deflector, or heat-retaining device for the interiors of tubes is formed out of a single blank of metal, bent to the required shape. The wings B, B may be plane or twisted, and are preferably rounded at their outer edges C so as to enter the tube more easily.

21,851. Jenkins, H. C., and Lowden, T. C. Oct. 17. Drawings to Specification.

Heating liquids.—Brine or other liquid is heated in an annular tank forming the cover of a gas-producer; it is also heated in the casing of the producer. Water may also be sprayed into the casing so as to run down the inner walls. The tank is formed with radial partitions, all but one of which have openings, alternately near the circumference and near the centre, so as to cause the liquid passed through it to take a tortuous path.

22,121. Killick, G. E., and Cochran, G. W. Oct. 21.



Boiling-pans.—Relates to means for preventing splashing in running off water &c. from a cooking or other similar pan F. A truncated funnel A is pivoted to a rod D which slides in a guide f so

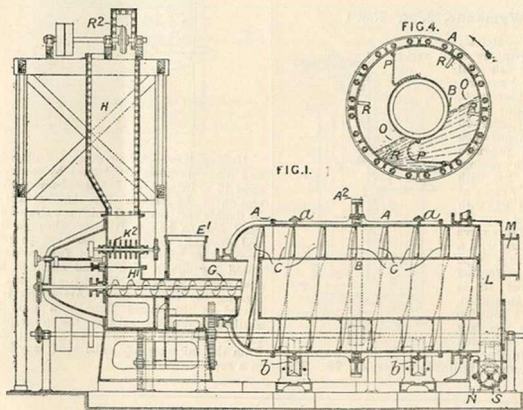
that the funnel can be run out under the cock E to lead the water from the cock to the grating H. The funnel runs on wheels B, and may have a perforated bottom.

22,207. Hercelle-Leruste, V. Oct. 21.
Drawings to Specification.

Heating buildings.—Relates to improvements in the heating and ventilation of dyeing, cloth-finishing, &c. workshops in which large quantities of steam,

vapours, and odours of any kind are given off. The roof of the building requires to be furnished with material for stopping up the chinks, or an isolated air chamber keeping the temperature inside the building constant must be formed under the roof, so as to exclude the external air. By this means the roof is rendered non-condensing. The walls also are rendered non-conducting for heat, and thus large condensing-surfaces are got rid of. The temperature is kept sufficiently high by means of heating-pipes placed opposite to suction openings for fresh air. A collection of ventilators and fans carries off the air charged with moisture, and supplies fresh air in the workshop.

22,291. Yeadon, A. E. N. Oct. 24.



Heating-apparatus.—Coal, peat, grains, &c. to be heated are fed by an elevator K^2 to a hopper H sufficiently long to prevent the passage of air therethrough. On leaving the hopper the material is broken up by knives K^1 , which rotate at different speeds, and is thence fed by a screw H^1 in the tube G, to a rotary cylinder A, where it meets a current of hot air or furnace gases drawn through the apparatus from the inlet M to the outlet E^1 . The cylinder A contains an inner cylinder B, a spiral blade C, breaking-knives R, and chains P, and has bearings A engaging rollers B. The material is discharged into a chamber L having a discharge pipe N and screw S. The cylinder is actuated by toothed wheels A^2 and pinions. The level O of the material is kept higher than the bottom of the cylinder B, as shown in Fig. 4.

22,312. Collins, A. J. Oct. 24.

Boiling-pans.—The bottoms are formed with a water chamber B separated by an air space C from the main portion A. Circulation pipes F and D lead the water in and out. A baffle-plate E is fitted over the pipe D.

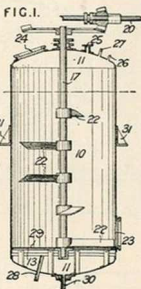


22,353. Grünzweig, C. Oct. 24.

Non-conducting coverings and compositions.—Relates to the manufacture of moulded heat-proof and damp-proof articles or material from cork &c. In moulding the material, a suitable heat-resisting binding-agent, such as paste, glue, paper pulp, clay, &c., is employed. After moulding, the air is exhausted from the articles by a vacuum, and they are then treated, under pressure, in a waterproofing-bath of hot pitch, asphalt, wax, ozokerit, tar, &c., or mixture of these substances. The material so prepared may be used for the covering of conduits in damp shafts, on bridges, &c., or on heated objects which are exposed to the action of water.

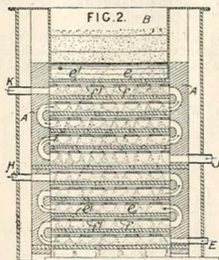
22,916. Wymonde, T. H. Nov. 1

Digesters.—Relates to digesting-apparatus for cooking fish offal by steam and extracting the oil therefrom. The apparatus comprises a cylinder 10 with dish-shaped ends 11, 11 and provided with closable openings at 23 and 24, with steam supply pipes at 27, 28, and 29, with an oil outlet pipe 30, with a safety-valve pipe at 25, and with a pressure gauge pipe at 26. A perforated false bottom 13 is suitably supported, and carries a footstep bearing for a rotary shaft 17 provided with a number of helically-arranged inclined blades 22, 22. The



shaft 17 is driven by bevel gearing from a shaft 20 in either direction, according to the purpose it is intended that the blades 22 shall fulfil. The digester is supported on the lugs 31, 31.

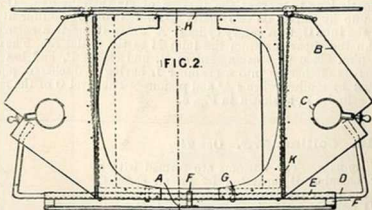
23,126. Niewerth, H. Nov. 3.



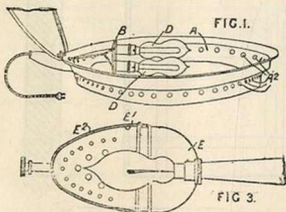
Heating gases.—Air or gases for blast-furnaces and other purposes are heated by means of hot sand in a furnace or heating-chamber shown in section in the Figure. The chamber A is divided by double partitions e, f, which are slotted at e', f'. Sand from a hopper B passes through the slots and gradually falls from partition to partition. Combustion products from a furnace are introduced through a pipe J and circulate between the upper partitions to the exit pipe K, so heating the falling sand. Air which is to be heated is introduced through a pipe E, and similarly circulates between the lower partitions to the exit pipe H, so as to abstract the heat from the falling sand. The sand may be heated in a separate furnace.

23,142. Dowsing, H. J. Nov. 3.

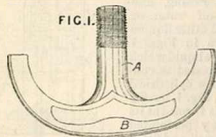
Heating by electricity.—In apparatus for applying radiant heat and light to the human body, as described in Specifications No. 26,249, A.D. 1896, and No. 4786, A.D. 1897, electric incandescents or other lamps C are supported within copper or other reflectors B, between which the body is placed on a table A. The reflectors are supported by rods D and clips G, which slide in and on two guide-tubes E, carried by supports F on the table; the reflectors are thus movable to or from the body. The clips G are hinged, and may be raised to allow



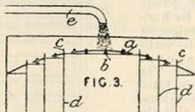
the reflectors to be removed. Screens K are movable vertically in the reflectors, and end doors and a cover H are used to close the openings between them. The reflectors may be suspended or supported otherwise.

23,143. Buck, W. No. 3.


Bed-warmers; footwarmers.—A warming-pan A, Fig. 1, has two electric lamps D fitted to a bridge-piece B and connected by insulated wires, passing through the handle, to a wall-plug. The sides of the warming-pan may be perforated with holes A² for the escape of heated air. An appliance for warming any part of the body has a receptacle E, Fig. 3, fitted with an electric lamp and closed by a double perforated cap E'. The outer cap can be rotated to open or close the perforations. The appliance may be surrounded by a protecting wire casing. The Provisional Specification mentions the application of the invention to footwarmers for carriages, in which resistance coils may be substituted for the lamps.

23,476. Mills, A. A. Nov. 8.


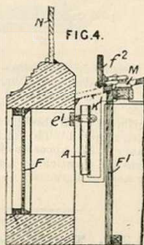
Heating water; kiers.—Relates to covers for hot-water boilers, kiers, and the like, and consists in making in one piece the shank A and bridge-piece B of the cross-bar used for securing the cover.

23,752. Barralet, T. E. Nov. 11.


Heating liquids.—An appliance, chiefly for use in water-heaters of the geyser type, for distributing water or other liquid for the purpose of heating it, is shown in section in Fig. 3. The supply pipe e directs the water on to a curved plate a, which is perforated with concentric rings of holes b, each of which has a projecting tongue c. The sheet of water passing over the plate is broken up by the tongues, which cause jets of water to pass downwards on to heating-surfaces d.

23,999. Statter, J. G., and Maule, E. H. Nov. 14.

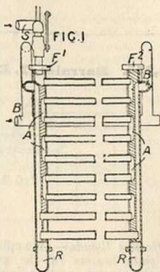
Heating air; heating by electricity.—A window or the like N is kept dry or dried by air admitted from outside through a guard F, electric heaters A, and wire gauze K¹ in a long opening in a casing F¹, below the glass. The opening may be closed by a door f², which is linked to a switch M supplying the heaters, so as simultaneously to stop the supply of electricity. The door itself may carry the movable part of the switch. The heaters are coils of wire contained in tubes A, carried by brackets having heat-dissipating projections e¹. The wire is preferably of semicircular section, coiled into an internally-smooth helix, which is screwed into screw-threaded metal supporting-rings; for alternating currents the wire is coiled double, to avoid induction. The tube is of metal lined with asbestos, or of asbestos paper laid on the wire helix and secured by cement.



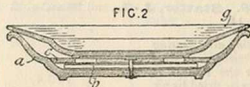
24,132. Sandbach, W. Nov. 16.

Heating liquids.

—A heating apparatus for use in dairies and creameries is shown in section in Fig. 1. Hollow metal columns F^1, F^2 are connected by horizontal tubes, as shown, or by vertical or diagonal tubes or coils. The columns are fitted with recessed chambers A , so that the heating-fluid can circulate from the supply pipe S through the tubes, and be withdrawn through overflows B . The apparatus is placed in a tank of milk or cream &c., and can be increased or diminished in size by using telescopic tubes, or by fitting the ends of the columns with extending legs R .



24,196. Kahrs, C. H. Nov. 16.



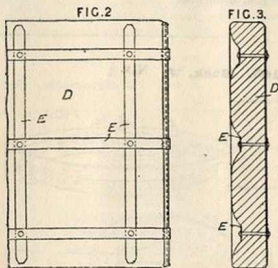
Heating by electricity.—Relates to apparatus for heating plates, dishes, &c. while on a dining-table. A vessel a constructed to receive an ordinary plate g or dish &c. is fitted with an electric resistance coil b through which a current is passed when required. The coil is covered by a perforated plate c . The apparatus is fitted with connecting-wires and a switch, or a single switch may be used for a set of warmers.

24,380. Taylor, E., and Taylor, S. T.,
[trading as Taylor & Sons, S. T.] Nov. 18.

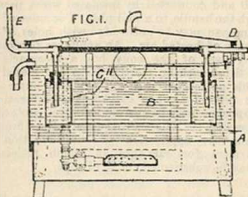
Non-conducting coverings.—A non-conducting mattress for covering boilers, tanks, and the like is shown in the Figures. The mattress D is riveted or otherwise secured to a frame E , formed of metal bands. The ends of the bands are adapted for securing the mattress to an adjacent mattress or to the angle-bars of the boiler, so as to form a continuous covering.

(For Figures see next column.)

24,380.

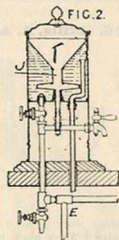


24,518. Davies, J. G. Nov. 21.



Heating liquids.—An apparatus for heating, cooling, raising, and drawing-off water or malt and other liquors is shown in Figs. 1 and 2. The liquid which is to be heated is contained in a cylindrical vessel B , Fig. 1, having chambers formed at its ends by perforated partitions C^1 , and fitted with supply and delivery pipes D, E . The vessel is placed inside a boiler A , which is heated by a gas burner.

The heated liquid passes into a bar appliance shown in Fig. 2, through the delivery pipe E , from which it can be drawn off as required. A jacketed pan J for heating malt or other liquor is placed inside the bar appliance.



1898]

ABRIDGMENT CLASS HEATING.

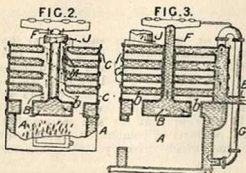
24,803. Borchers, W. Nov. 24.

Heating-apparatus; heating by chemical action.
—In an improved method of heating or fusing refractory and other substances, described for fusing the ingredients employed to produce calcium carbide, the materials are mixed with fuel, all being preferably in a pulverized form, and with liquid air or liquid oxygen, and then igniting the mixture in any known chemical or electrical way. The process may be carried out either in open or closed vessels. In the latter case, the vessels may be provided with pressure-regulating devices, and the gases produced by the reactions, for instance carbonic oxide, may be used in another heating-apparatus.

25,023. Brennecke, O., and Timar, I.
Nov. 26.

Heating by electricity; heat-storing apparatus.
—Relates to a method of heating electrically-propelled tramway and other vehicles. Large thermophores or heat-storers containing a heat-absorbing substance, such as acetate of soda, which is caused to melt by the heat generated by an electric current passing through an embedded spiral resistance, are placed under the seats of the car or in other suitable places. The current is passed through the thermophores while the accumulators for working the motors are being charged. By this means the accumulators receive their current exclusively for the purpose of working the motors.

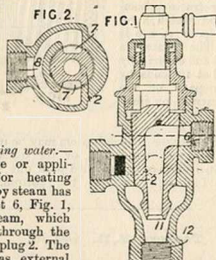
25,063. Boulton, A. J., [Walsh, W. J.,
Ryckman, G. M., and Le Hans, M. H.],
Nov. 28.



Heating water.—A sectional hot-water boiler for supplying radiators is shown in Figs. 2 and 3 in front and side elevation respectively. The section B is placed immediately over the fireplace A, and on it are placed sections C, which fit on to one another as shown, and which contain two chambers, one forming part of the water-circulation apparatus, and the other forming part of the flues. Water from the return pipe E circulates through

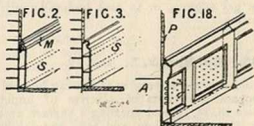
the sections C, and absorbs heat from the products of combustion. It then passes through the circulation pipe G to the lower and hotter section B, whence, after being further heated, it passes to the radiators through the outflow pipe F. When the fire is started, the dampers M are left open, as shown in Fig. 2. Afterwards, the dampers are closed, and the hot gases, after passing through openings b in the lower section B, pass through openings, not shown, in the upper sections C, and circulate between the sections before passing into the exit flue J.

25,128. Marshall, L., and Naylor, S.
Nov. 29.



Heating water.—A valve or appliance for heating water by steam has an inlet 6, Fig. 1, for steam, which passes through the hollow plug 2. The plug has external recesses 7, Fig. 2, which connect the branched water inlet 8 with the interior 11 of the valve casing, where the steam and water mix, so that heated water emerges from the discharge nozzle 12. The temperature of the water is controlled by varying the position of the plug so as to admit the required proportions of steam and cold water. The steam and water inlets may be interchanged.

25,335. Scotland, T. Dec. 1.

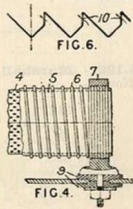


Heating buildings &c.; heating air.—Dwellings, halls, &c. are heated by using hollow metal

wall-skirting or tubes for circulating the heating-medium. The skirting may be in the form of a single tube, or it may be in two or more parts, as shown in sectional isometric projection in Figs. 2 and 3. The skirting S may be fitted with a separate moulding M, or, as shown in Fig. 3, the moulding may form part of the skirting. Various forms of skirting are described. If the building is to be heated by hot air, tubes P, Fig. 18, may be provided, through which air is admitted into the building from a shaft A.

25,746. Christy, F., and Christy, L. F. Dec. 6.

Heating by electricity.—A heater, partly shown in Fig. 4, consists of an angular support 4 of wire gauze, perforated metal, porcelain, or slate, the metal being covered with asbestos 5, mica, enamel, or other refractory insulator, upon which a resistant strip or wire 6 is coiled. The heater is supported and electrically connected at its ends by screw clamps 7 or the like, carried on insulators 9, so that the heater may be readily replaced by another. Such heaters may be used as radiators for warming rooms, or for other purposes. An oven may be provided with one heater near the top, and two on the bottom. To



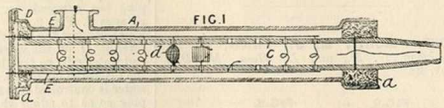
prevent drippings from falling on the lower two, a sheet of metal, Fig. 6, is placed above them, having holes 10 punched in it, and bent to the form shown. The heat produced may be regulated by switches placing one or more heaters in circuit, using electrical or optical temperature indicators, or automatically by expansion or resistance variation.

26,134. Bergmann, F. J. Dec. 10. *Drawings to Specification.*

Heating-apparatus.—Relates to a method of obtaining high temperatures for fusing refractory metals, producing carbides, and for like purposes, consisting in the employment of a closed chamber, heated externally, the capacity of which can be reduced, for instance, by means of a piston, or into which highly-heated compressed gas can be introduced. After a temperature of from 1000° to 1200° C. has been attained, a further increase is produced by reducing the capacity of the chamber, or forcing in the heated gas under pressure.

26,154. Tschernoff, D. Dec. 10.

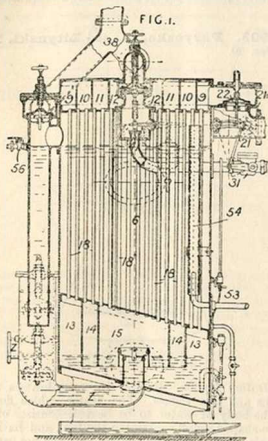
Heating by electricity; heating gases.—Heat is distributed from a central station by producing gas from liquid or solid fuel for driving gas engines and dynamos supplying electric conductors, the electric energy being reconverted into heat where required, by air or gas heaters such as that shown in Fig. 1. A tube C of refractory non-conducting material contains resistant wires or the like d, connected through lateral holes with the supply conductors E. The tube and conductors are surrounded by a casing A, D, the ends of which are packed with asbestos a, and through which air or gas may be passed into the tube C. For high temperatures, the tube C may have double walls, with an air space between them. These heaters may be set vertical to warm the air in rooms, the heating causing a draught through them. They may also be used to heat air and gas supplies to glass, metallurgical, and blast furnaces; the waste gas or hot products of combustion from these are used in gas engines, or to heat boilers supplying steam engines, which drive dynamos connected to the heaters.



26,186. Booker, J. I. Dec. 12.

Heating water.—Apparatus which can be used as a water heater or as a condenser is shown in Fig. 1. The apparatus consists of a series of annular chambers 9, 10, 11, 12, connected by pipes 18 to chambers 13, 14, 15, and forming a surface apparatus through which exhaust steam, admitted through a pipe 21, can circulate and heat water which is admitted to the central chamber 6 through a jet 41. The steam may finally pass through and heat the water-jet, and pass into an exit pipe 38. The steam-inlet valve 22 is connected by linkwork to the water-inlet valve 31, so that they work

simultaneously. A guard pipe 54 protects the pipe 53, through which the heated water is withdrawn, and scum is removed by means of a cock 56.

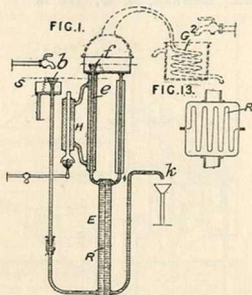


By arranging the various valves the apparatus can be used as a condenser, an air pump being connected to a pump Z.

26,342. Johnson, J. Y., [*Forbes, W. S.*].
Dec. 13.

Heating liquids.—Relates to apparatus, independent of valves, for automatically heating liquids to any predetermined temperature for sterilizing or other purposes, and to extraction of volatile constituents from large volumes of liquid by distillation. Fig. 1 shows the form of the apparatus diagrammatically. The liquid to be heated is received in the funnel *b*, passes into the heat-exchanger *E*, where it is warmed by the descending previously-heated liquid, and finally overflows at *f*, when its temperature is a certain fixed temperature, having been further heated by the water or steam jacket surrounding the tube *e*. The temperature to which the liquid is raised is determined by the difference in level between *f* and the liquid level *S*. The discharge pipe *k* may become the source of supply for another and similar apparatus. The volatile products may be condensed in the worm *G*, or, if combustible gases are produced, they may be used to maintain the heat at the stove *H*. Fig. 13 shows one way of forming

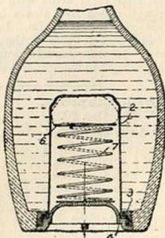
the partition *R* of the heat-exchanger *E*, and ensures leakage occurring only to the outside. Other forms differing but little from this are described. An inverted baffle and cup may be



used to regulate the liquid supply. In a modification adapted for heating liquids under various pressures, the supply and overflow tanks are closed. For heating liquids at any temperatures a closed chamber filled with air &c. is inserted in the pipe *e*, and for heating on a large scale, a long temperature exchanger is employed. Other slightly modified forms of apparatus for sterilizing water for domestic purposes, or for continuous runs, and for maintaining the same liquid level in the supply tank and the pipe *e* are described. A suitable form of water heater is described in which the liquid enters a hollow vessel having a concave bottom which forms the dome where heat is applied, and, being heated between an internal shell and the dome passes to the outlet.

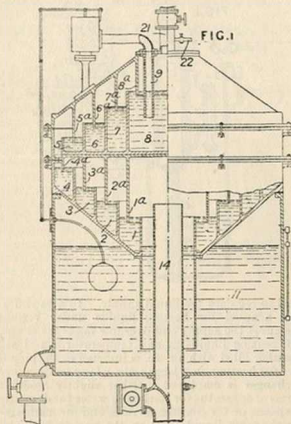
26,536. Thompson, W. P., [*Bonnefont, G.*].
Dec. 15.

Heating liquids.
—Relates to a decanter or water-bottle adapted for heating or cooling the liquid which it contains. The metal chamber 2, adapted to contain the heating or cooling medium, is fixed by the screwed ring 3 in a suitable aperture in the bottom of the vessel, the ring 3 being cemented &c. in position.



The chamber 2 is closed by the screw plug 4 and a suitable washer, the plug 4 being adapted to screw into the ring 3. The Figure shows a decanter arranged for cooling by ice.

26,613. **Bowden, H. W.** Dec. 16.



Heating water.—Apparatus for heating and purifying water by steam is shown in Fig. 1. Annular water pockets 1 to 8 have plates 1^a to 8^a dipping into them, and are supplied with water from a pipe 9. The water overflows the edges of the pockets, and passes downwards into the purified water receptacle 11. An exhaust steam inlet pipe 14 supplies steam, which circulates upwards and heats the water, at the same time causing it to deposit calcareous or other matter. The steam exit pipe 21 is fitted with a live-steam pipe 22, through which live steam can be introduced in place of exhaust steam. In a modification, the exhaust steam flows in the same direction as the water. In other modifications, the annular pockets are arranged in tiers in sets of two.

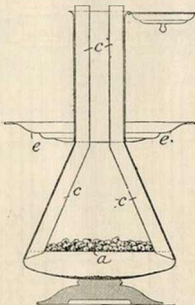
26,870. **Clapcott, F. B.** Dec. 20.

Bed-warmers; foot-warmers.—Fig. 1 shows a combined bed and foot warmer. When used as a bed-warmer, the cylinder *a* is filled with hot water, and the axle



ends *b*, *b*¹ are entered into slots and are held in position by catch pieces so as to prevent the cylinder from slipping out. After being used as a bed-warmer, the cylinder *a* can be removed and put into a flannel jacket and used as a footwarmer.

26,902. **Paryczko, A., and Litynski, L.** Dec. 20.



Heating liquids.—Relates to water-heaters for baths and like vessels. The heater, which floats in the body of water to be heated, consists of a cone-shaped vessel containing the fuel, and having the air-supply pipes *c* in contact with the hot gases, so that the air supply is heated. If liquid fuel is used, the grate *a*¹ used with solid fuel is dispensed with. *e* is a steady-plate which also increases the heating-surface.

26,905. **Lamplough, F.** Dec. 20.

Thermostats; steam traps; heating buildings.—A heat-regulating device for incubators, gas ovens, boiling-vats, &c., which can also be used as a steam trap and radiator, is shown in elevation in

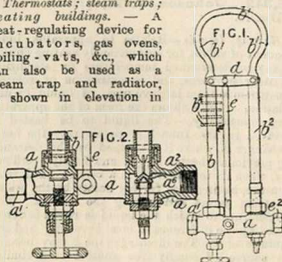
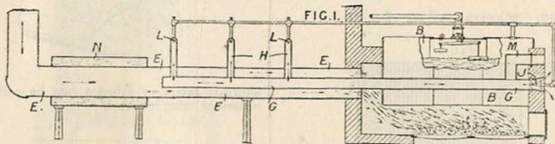


Fig. 1, and a detail view is shown in section in Fig. 2. The body *a* of the apparatus has

a gas or steam inlet a^1 , which is connected by means of tubes b, b^1, b^2 with the exit a^2 . The tubes b, b^2 are made of more expandible metal than a bar e on which the connecting cross-bars d are pivoted, so that any expansion of the tube b is transmitted in an enlarged form to the tube b^2 , the end of which slides through a stuffing-box and closes the exit valve a^2 , and

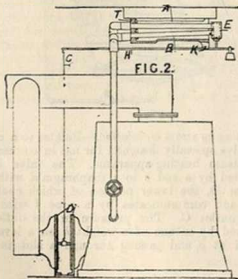
vice versa. In a modification, the tubes are replaced by rods, and a passage way is made through the body of the apparatus. The apparatus can be adjusted so that, when connected to a steam pipe, it will act as a steam trap and blow off the condensed water at intervals. The tubes may be fitted with gills b^3 so as to act as a radiator.

27,162. Green, W., and Foster, B. S. Dec. 23.



Heating buildings &c.; heating air; heating water.—Apparatus for heating greenhouses and the like, and for supplying them with heated air, moisture, and fumigating or fertilizing gases, is shown in Fig. 1. The flue E from the furnace passes through the greenhouse, and may have a water jacket N. Steam from the boiler B is injected into a tube G through a nozzle J, and draws air into the tube, which is placed in the interior of the flue. The moistened and heated air passes into the interior of the greenhouse through pipes H, which may also be fitted with steam nozzles L. Fumigating or fertilizing gases may be introduced through the tube M.

27,228. Geipel, W., and Lange, F. M. T. Dec. 24.

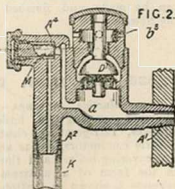


Thermostats.—A thermostat for regulating the supply of air to the furnace of a hot-water heating-apparatus is shown in Fig. 2. Two tubes A, B, supported at one end T and connected by a cap E at the other end, are made of metals, preferably brass and iron, having different coefficients of expansion. The fixed ends of the tubes are connected to the flow and return pipes, respectively, of the heating-apparatus. The cap is connected

to a lever H, pivoted at K, which is connected by a cord C to the damper D. The hot-water circulates through the tubes, which expand or contract according to the temperature of the water and work the damper so that the required amount of air is admitted through the furnace, and if necessary above the furnace also. In modifications, the expandible tubes are replaced by rods, which are placed inside the boiler, or in a box through which the hot water circulates.

27,292. Jamer, J., and Jamer, W. H. Dec. 27.

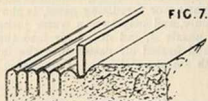
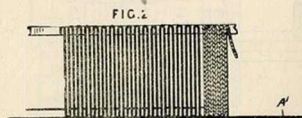
Heating buildings, radiators for. Relates to automatic vacuum and air valves for use in steam radiators. Fig. 2 shows the arrangement in vertical section. When conditions tend to produce a vacuum in the radiator, the valve D¹ is depressed from its seat, and the external air



enters through the lateral passages b^2 into the chamber a , and through the nozzle A^1 into the

radiator. The plug M is of hard vulcanized rubber or other material more expansible than the metal of the body, and is adjusted close to the seat A' when the device is at steam heat. When air accumulates, it is allowed to escape by the contraction of the cooled plug M. If water is discharged with the air, it may be led to the drain pipe K fitted to the nozzle A².

27,297. **Martin, R. H.** Dec. 27.

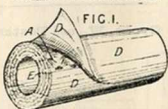


Non conducting coverings.—Relates to non-conducting coverings formed from sheets of suitable material into pleats or folds, held together by adhesive material, or by means of tape, cords, or wires. Fig. 2 shows a sheet folded into pleats which are pressed against one another and are attached together with adhesive material or other means. Non-conducting filling-material may be placed between the pleats. The sheet from which the covering is formed may be of hair felt, fire felt, asbestos paper, or the like. The covering may be attached to a base sheet A' of paper or fabric, or of asbestos or like material. Fig. 7 illustrates a covering made from a bat or felt of asbestos fibre, hair, or equivalent soft fibrous material. The manner in which the coverings can be made and finished is described in the Specification.

27,536. **Bell, E. W.** Dec. 30.

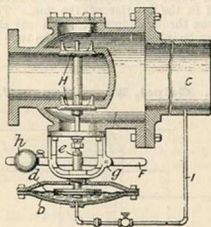
Non-conducting coverings.—An insulating and fireproof covering for boilers, cylinders, stills, uptakes, refrigerating-chambers, pipes, valves, electric conductors, &c. is shown in the Figures. For covering boilers and the like, the covering is in the form of a mattress made of layers of asbestos A, shown in section in Fig. 3, which are indented so as to form air chambers B. The indented layers are separated by plain layers C. As adapted for pipes and the like, the asbestos layers are rolled into tubes as shown in Fig. 1,

which are longitudinally divided at E, so that each asbestos tube can be sprung into position on a pipe and covered with a layer of canvas D. The



alternate layers of asbestos may be perforated, instead of being indented.

27,629. **Lake, H. H.,** [Kieley, T. J., and Mueller, F. T.]. Dec. 31.

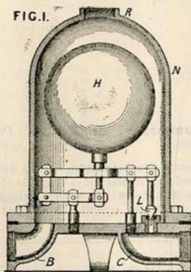


Heating by steam circulation.—Relates to a reducing-valve specially designed for use in connection with steam heating-apparatus. The valve H is connected by a rod e to a diaphragm d within a chamber D, the lower portion of which contains water and communicates by a pipe I with the steam outlet C. The pressure in the outlet is regulated by means of a weight h on a lever F, pivoted at g, and passing through a slot in the rod e.

27,631. **Lake, H. H.,** [Kieley, T. J., and Mueller, F. T.]. Dec. 31.

Steam traps.—Fig. 1 shows a sectional elevation of a steam trap, the valve being closed. The base-plate has the inlet pipe B and outlet pipe C formed thereon, and the dome N secured thereto. The valve L is opened by means of the lever arrangement when the float H rises. When the lower

inlet B is used, the upper inlet R is closed, and vice versa. A modified arrangement with balanced

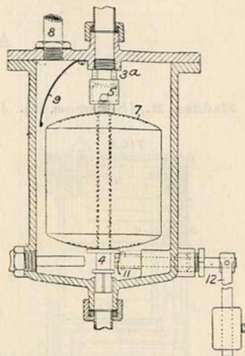


valve is also described and illustrated in the Specification.

27.637. Sanders, C. H., [Shaw, E.].
Dec. 31.

Steam traps.—Relates to apparatus primarily intended for separating steam or vapour from hot syrup employed in the manufacture of sweetmeat, and for regulating the discharge of the syrup. The apparatus is however applicable generally for separating steam and vapour from liquids, and regulating the discharge of the same. Syrup from a closed heating-coil is delivered at 8 into a chamber containing a float 7 and two valves 4 and 5. The

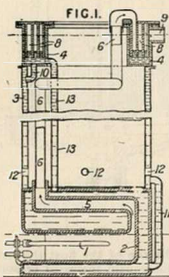
valves, which are attached to the float, control the discharge of the syrup and the escape of the steam or vapour respectively, and are so arranged that both are not fully open at the same time.



When by the rise of the float the steam valve is closed, the consequent increased pressure causes a quicker delivery of the syrup. The valves may be raised by hand, to enable the apparatus to be emptied and cleaned, by lifting the weighted lever 12 and so bringing a cam finger 11 into engagement with the valve 4. A guide-plate 9 prevents the entering syrup from splashing on the valve 5 and the float 7. The valve 5 preferably consists of a sleeve or socket fitting over a cylindrical projection 3^a in which lateral ports are formed.

A.D. 1899.

71. Haddan, R., [Schuppmann, H.]. Jan. 2.

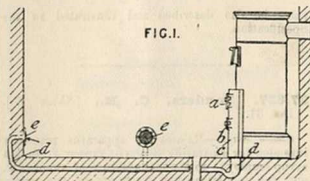


Heating buildings; heating water.—Relates to a water-heating stove for warming purposes. Fig. 1 shows a stove heated by gas, but the stove may be heated by solid or liquid combustibles or other heat source. A boiler 2 heated by a gas burner 1 is in connection with a water mantle or jacket 3 and an expansion vessel 4. The waste gases from the burner pass through the flue 5 and up the pipe 6, and are conducted into the upper part of the vessel 4, the cover of which is provided with a number of passages 8; after passing over the surface of the water in the vessel 4 they escape through a pipe 9, which also serves as an overflow for the water. The heated water from the boiler ascends through a pipe 13 to the vessel 4, and from there through a pipe 10 to the jacket, and back again into the boiler through a pipe 11. The gas supply pipe 14 may be fitted with an automatic regulating-device. Openings 12 are arranged in the lower part of the jacket 3, to put the interior of the stove into connection with the outside air. In another form of the stove, the connecting-pipe 13 is formed as an annular chamber, and the heating-gases pass through an annular space, formed between the water columns, to the chimney. The air of the room is heated by passing up the centre of the stove and out at the top.

87. Duckering, S. Jan. 3. Drawings to Specification.

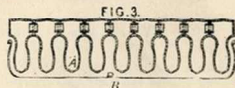
Thermostats for incubators. The temperature is regulated by means of a capsule filled with ether, the expansion of which, acting through suitable connections, operates a damper over the lamp flue.

194. Schädlich, J. A. Jan. 4.



Heating buildings.—Relates to the arrangement of a stove and air supply pipes for the purposes of uniformly heating a room. The stove is fitted with a box *c*, from which run pipes *d*, under the floor, having outlets in the walls of the room, preferably in the corners. The outlets are covered with wire gauze *e*. After the stove has been lighted, the doors *a, b* on the box *c* are closed so as to be airtight, and the air supply is drawn through the pipes *d* from different parts of the room, so that the warm air is forced to flow to these parts.

245. Williams, J. E., and Walford, J. T. Jan. 5.



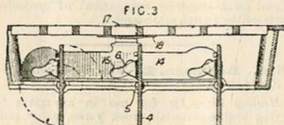
Heating buildings.— A radiator for heating hospitals, infirmaries, and other buildings is shown

1899]

ABRIDGMENT CLASS HEATING.

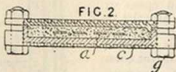
in sectional plan in Fig. 3. A series of metal loops or gills A are connected together to form the radiator, which is covered in front by a shield or fender B.

349. Tuttle, S. Jan. 6.



Heating buildings.—Relates to a hot-air register containing a simple self locking arrangement of valves. The valves 4, shown open in the section, Fig. 3, are mounted on central pivots 5. These valves are opened and closed simultaneously by a sliding bar 14, actuated internally by the arm 17. Curved slots 15 in the sliding bar act on pins 6 mounted on the back of the valves. These slots are so shaped that, when the valves are closed, a further movement of the bar locks them. The sliding bar is pressed against the pivots 5 by a leaf spring 18.

416. Barman, A. Jan. 7.

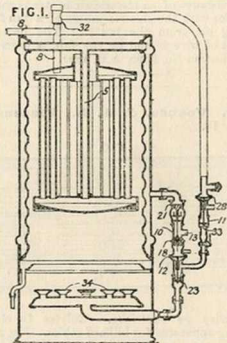


Heating by electricity.—A heating-resistance consists of a nickel-steel, manganin, or other metallic ribbon *a*, extended in parallel lengths, or doubled and coiled on a glass plate, and embedded in a dry insulating-powder in a flat metal case *c*, which has a flanged lid secured by bolts *e*. The case and lid may be ribbed externally. The insulating-material may be talc, or a mixture of silicic acid, clay, oxide of iron, and magnesia, with a little lime.

587. Winterhood, J. Jan. 10.

Heating water.—Relates to goysers and automatic valve attachments therefor. The general arrangement of the water-heater, and the gas and water valves, is shown in Fig. 1. The inner casing of the double cylindrical casing is corrugated, and the boiler, which is tubular with disc-shaped ends, is within the casing and connected with it by the tube 5. An atmospheric burner 34 is provided. There are two valves: a primary valve 10, and a supplementary valve 11. Water entering by the inlet 13 opens the valve 18, while passing to the boiler, and pressing on the rubber diaphragm 12 opens the gas valve 23. If by accident the gas

valve 23 does not close when the water supply is cut off, then, the check valve 21 being closed, the pressure of the water opens the safety-valve 32 on

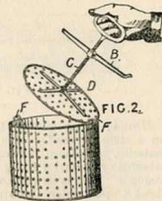


the outlet 8, and water passing over the supplementary valve 11 depresses the diaphragm 12 and closes the valve 33, so cutting off the gas supply.

742. Brook, C. A. Jan. 12.

Boiling-pans.—

Relates to a vegetable cooker and strainer applicable also for washing or boiling clothes. A perforated vessel *A*, adapted for use in an ordinary saucepan, is fitted with a pressing-plate *D*, to which is secured a screw *C* through a cross-bar *B*. The bar is adapted to fit in lugs or projections *F* on the vessel, and these lugs are so arranged that the bar is disengaged on turning the screw to raise the plate. In a modified form, the plate *D* and cross-bar are arranged to fit in an ordinary saucepan, the perforated vessel *A* being omitted.

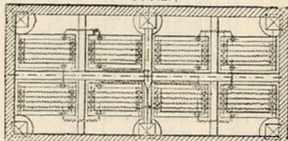


- 1001. Porter, E. F.** Jan. 16. *Drawings to Specification.*

Heating by electricity.—A part or the whole of the resistance of an electric air-heater is connected in series with the electric motor of a fan for propelling air from the heater. The heater may consist of wire wound on the fan, as described in Specification No. 5595, A.D. 1891.

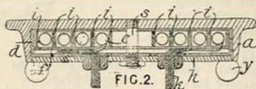
- 1249. Veauce, J. A. A., Viscount de.** Jan. 18.

FIG. 2.



Heating by electricity.—Relates to electrical heating-apparatus for billiard tables. Fig. 2 shows in plan the arrangement of the rheostats having two wires, one for slight and the other for medium heating, or both for greater heating, which are arranged under the bed of the billiard table. A partition supports the rheostats, and prevents the heated air from escaping too quickly. A switch is provided on the billiard table or on the wall of the billiard room.

- 1493. Jolin, P.** Jan. 23.



Heating by electricity.—Resistant wire is coiled on a strip or cord *c* of a refractory insulating-material, and placed between insulating-strips *i* on asbestos or enamel *d* lining the interior of a metal casing *a*. The coils are covered by an insulating-sheet *f*, upon which the wire ends are attached to flexible leads *k* by twisting and clamping them between pairs of washers on eyelets. These joints are covered with a second insulating-sheet and a metal plate *A*, which is secured by a bolt *s*, the flexible leads passing through insulating-bushes in the metal plate. When alternating current is used, the strip *c* may contain an iron core, to give additional heat due to eddy currents. The casing may have three feet *y*, and serve as a radiator or heater. Ovens, saucepans, and other cooking-apparatus, and irons for branding, pressing clothes, or other purposes, may be similarly heated. A

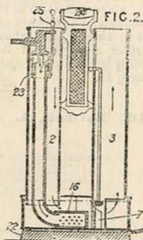
tailor's iron may have a spring switch in the handle, adapted to be closed by pressure of an insulating-stem carried on a spring under the handle when the iron is lifted, to connect additional heating-wire in parallel with coils which are permanently connected. The switch may otherwise be normally closed, but opened when the iron is placed on a stand, by engagement of projecting parts of the switch and stand.

- 1514. Robinson, E.** Jan. 23. *Drawings to Specification.*

Heating air.—Air for use in apparatus for drying textile materials, wool, yarns, paper, pulp, &c. is heated by passing it through a spiral chamber through which pass a number of steam pipes.

- 1559. Byrne, E. J., and Kemp, C. M.** Jan. 23.

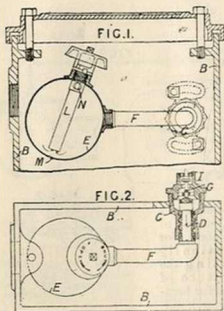
Heating water.—Relates to a submerged heater. The ducts 2 and 3 communicate with the combustion chamber, which is divided by lateral partitions and contains the burner 16. The sleeve 23 is operated by the rod 25, and opens or closes the air inlet to the mixing-duct. A damper 7 is arranged to cut off direct communication between the combustion chamber and the exit duct. The heater is provided with a handle 24, and a base 22 which is connected to the casing in such a manner as to leave a space between the casing and base. The heater, when submerged in water, may be used to heat a room, and is shown in the Specification applied to a bath.



- 1601. Butterworth, J.** Jan. 24.

Steam traps.—A steam trap of the kind described in Specification No. 23,794, A.D. 1895, is shown in sectional elevation in Fig. 1 and in plan in Fig. 2. A brass casing *C* is fitted to one side of the steam trap *B*, and the steam pipe or other vessel is connected to the casing at *I*, so that the steam presses the valve *G* on to its seat. The float ball *E* is connected by a hollow arm *F* to a quick-threaded hollow spindle *D*, which bears against the valve stem. When sufficient water has entered the float through the hole *M* to cause it to fall, the valve is opened, by means of the spindle, and any condensed water is forced through the spindle into the float, and ejected through a pipe *L*. When the condensed water is from high-pressure steam, it bursts

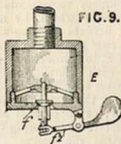
into steam in the float, and causes the float to rise and close the valve before the steam vessel is completely drained; this action is prevented by



fitting the ejection pipe L with an adjustable hole N through which the steam, so formed, can escape.

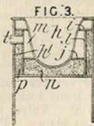
1637. Boulton, A. J., [Forsyth, J. E.] Jan. 24.

Steam traps. — Relates to automatic couplings for the air-brake, steam, and signal pipes of railway vehicles. A drip-box E is fitted under the steam-pipe coupling. The valve *f* is kept shut by the steam pressure. When the couplings are unscrewed, the steam pressure is diminished, and the weighted lever *f*² opens the valve and permits any condensed water to escape.



1640. Hougham, W. Jan. 24.

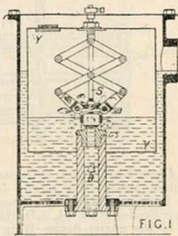
Boiling-pans. — Relates to a boiler which may be combined with a cooking-range or used alone. The boiler *h* is mounted in a casing *h*¹ formed with carrier rings *i* and *j*, which are supported by the cylindrical wall *l*. The spaces *n* and *p* are filled with sand and asbestos respectively. A flue *m*, provided with inlet and outlet



passages, surrounds the boiler, and a door is provided for access to this flue. When used separately from the range, the boiler may be heated by a fire placed beneath it.

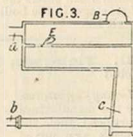
1728. Nasmith, J. W. Jan. 25.

Steam traps. — The trap, which is of the float and valve type, is shown in section in Fig. 1. The valve seated on the vertical inlet pipe B is controlled by the movement of the float Y, to which it is connected by a series of levers. The screwed rod S is loosely coupled to the valve, and is adjustable so as to limit the movement of the valve.



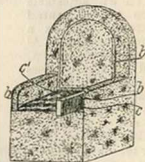
1752. Payne, F. G. Jan. 25.

Heating water. — A double-jacketed hot-water boiler for greenhouses and other buildings has flow and return pipes *a*, *b*, Fig. 3, and is fitted with a lamp placed in the lower part *c*. The products of combustion pass upwards through the openings E, B. The boiler is placed inside a suitable cover fitted with a flue.



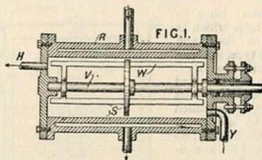
1945. Smith, A. Jan. 27.

Hot-water bottles and similar heating-apparatus. — The covers of invalids' beds &c. are provided with pockets *b* so arranged as to hold block tin or other vessels *c* containing hot water against the parts of the occupants' body required to be so treated. The Figure shows a chair, the cover of which is so



pocketed. The vessels *c* are provided with filling-inlets *c*, closed by a screw cap or its equivalent, and may be held in the pockets by hooks and eyes, springs, buttons, &c.

2059. Stephan, A. Jan. 30.

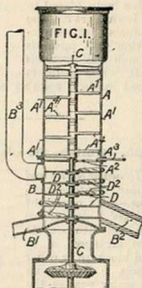


Digesters.—Relates to apparatus for the continuous treatment of size by boiling, and consists in improvements in the apparatus described in Specification No. 5164, A.D. 1898. Upon the shaft *V* of the mixing-device *W* in the boiler *R* are secured concentrically one or more discs *S* which are smaller in diameter than the boiler. In one modification, every alternate disc is formed large enough to bear against the interior of the boiler, and is provided with passages or ports. In another modification, the discs are secured to the axes in inclined positions. By these arrangements the raw material which enters the boiler at *Y* passes through various stages in the boiling before passing out by the exit *H*.

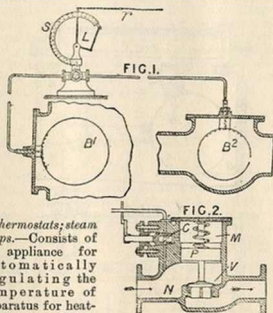
2231. Finlayson, F. E., and Cory, C. Feb. 1.

Heating - apparatus.

—In the manufacture of artificial fuel, the materials are mixed in a pug-mill or chamber *A*, beneath which is a heating-chamber *B*. The materials pass from the chamber *A* into the heating-chamber *B* through an aperture *A*², provided with an adjustable slide *A*¹. A central shaft *C* carries a number of heaters *A*⁴ within the chamber *A*, and a series of discs *D*, arranged beneath scrapers *D*² secured to the heating-chamber *B*, and formed with radial apertures allowing the fuel to be fed towards a discharge pipe *B*². Hot gases pass into the chamber *B* through a pipe *B*¹, and escape through a pipe *B*³. Steam is introduced into the chamber *A* through apertures *A*¹.



2409. Binny, W. M. Feb. 3.

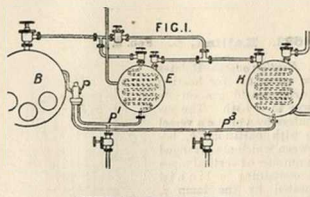


Thermostats; steam traps.—Consists of an appliance for automatically regulating the temperature of heating water or buildings by steam, which may also be used as a steam trap. Two bulbs *B*¹, *B*² are placed in the heater and return or make-up pipe respectively. The bulbs are connected together by a pipe, which is connected to a spring tube *S* of the Bourdon-gauge type. The bulbs, spring tube, &c. are filled with water, the volume of which is affected by any variation in the difference of temperature of the heater and return pipe, and so produces movements of the free end of the spring tube which, by means of levers *L* and a rod *r*, actuate a three-way valve *C*, Fig. 2. The three-way valve puts the chamber *M*, behind the piston *P*, in connection with the steam-supply pipe *N* or with a low-pressure chamber, according as the heater is sufficiently or insufficiently heated, so enabling the spring-pressed piston to close the valve *V*, or to open it and allow steam to pass to the heater. The spring tube may be replaced by a flexible diaphragm. The appliance may be placed on the drain pipe from steam-heating coils so as to regulate the drainage of the condensed water.

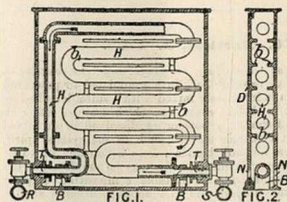
2411. Binny, W. M. Feb. 3.

Heating water.—Relates to apparatus for the supply of distilled water, for feeding boilers in connection with hot-water and steam supply and warming installations. A steam coil heater *H* of a hot-water system, and an evaporator *E* in which natural water is evaporated by means of the boiler steam circulating in the coils, are connected as shown in Fig. 1. The heater *H* acts as a condenser for the make-up supply, the condensed water being returned to the boiler *B* by the feed-pump *P*. Valves are arranged for the various pipes as shown. Pure hot water for washing or manufacturing purposes may be taken from the evaporator pipe *P*, or from the heater pipe *P*².

Warming-pipes in connection with the heater may be used in drying-rooms or for warming buildings.



2413. Binny, W. M. Feb. 3.

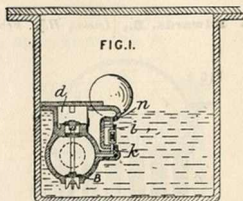


Heating buildings; heating air.—A hot-water or steam radiator, arranged so that the heating-coils can be swung on a horizontal axis for cleaning purposes, is shown in section in the Figures. The heating-coils *H* are bolted to hollow trunnions *T*, which work in bearings *B* and connect the coils to the supply and return sides *S*, *R*. Transverse ribs *b* are formed on the sides of the casing, and cause air, entering the casing through holes *N*, to be heated as it circulates round the pipes. The front *D* of the casing is hinged and opens outwards, to allow heating-coils to be swung over on the trunnions.

2467. Brookes, A. G., [Schoof, F.]
Feb. 3.

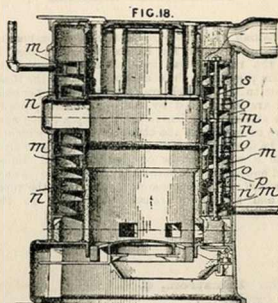
Steam traps.—Relates to traps in which an auxiliary valve operated by a float is adapted to discharge the water of condensation continuously without opening the main valve, and to control the main valve which opens when the condensation becomes active. One form of the apparatus is shown in Fig. 1. An intermediate chamber *d* is provided between the condensation vessel and the steam outlet. The auxiliary valves *k*, *i* are

coupled together, and engage with the lever of the float. The main valve *B* opens when the pressure falls within the chamber *d* by the closing of the aperture *n*. In a modified form of the trap, the



main valve opens by an increased pressure in the chamber *d*, the two valves *k* and *i* forming a double valve. Another form of the float, and suitable for high pressures, is also described.

2579. Mills, B. J. B., [Walbridge, W. De L.]. Feb. 4.

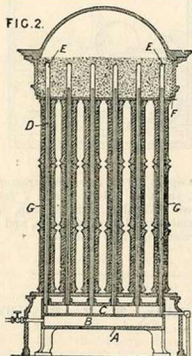


Heating water.—Downdraught stoves or furnaces are arranged so that the products of combustion pass through tubes in an annular water space, thereby raising the temperature of the water for heating purposes. In a hot-water heater, Fig. 18, which is described, the water space is divided into sections *m*, *n*, of different diameter, communicating with each other through ripples *o*, preferably

cast on the respective sections and entering sockets *p* in the adjoining sections. The sections are held together by bolts *s*.

made to circulate through the cylinders of the machine by forming their ends after the manner of propellers.

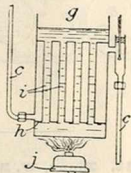
2648. Edwards, E., [Caesar, H.]. Feb. 6.



Heating buildings.—Relates to a steam-heating stove or radiator for houses &c. The base *A* of the radiator has two chambers *B* and *C*. Steam passes into the chamber *B* and up the inner steam tubes *D*, which are open at their upper ends and are surrounded by the outer steam pipes *E*. The steam is condensed in the pipes *E* and runs down as water into the chamber *C*, from which it can be drawn off. The pipes *D*, *E* are held by a plate *F* which can be covered with sand. Loose sand enclosed by earthenware or porcelain casings *G*, which may be ornamented, surrounds the pipes *E*, and serves to transmit the heat to the surrounding air.

2682. Kallina, L. Feb. 6.

Heating gases.—Relates to apparatus for heating carbonic-acid gas on its way to a bath. The gas enters by a pipe *c* a vessel *g* with partitions *h*, between which are arranged a number of vertical pipes *i* containing a liquid heated by the lamp *j*. After passing between these tubes the gas leaves by the pipe *c*.



2800. Bartlett, F. Feb. 8.

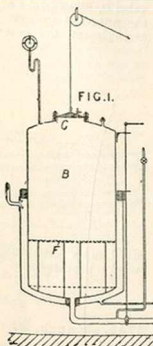
Non-conducting coverings and compositions.—Refuse or other cork in a granulated or powdered form is intimately mixed with a suitable adhesive, such as shellac, resin, &c., which may be either in the form of a powder, or dissolved in or mixed with a suitable solvent, such as methylated spirit, ether, alcohol, benzine, &c.; a solution of oxide of copper in ammonia &c. may be employed as the binding-agent. A suitable composition may be made with cork and an aqueous solution of shellac and borax. After mixing, the composition is spread out to dry, until all or most of the solvent has evaporated. It is then compressed in suitable moulds, baked or heated, while still in the moulds, to a temperature of between 200° and 300° F., allowed to cool, and withdrawn from the moulds, after which it can be turned, cut, sawn, polished, or otherwise treated, as desired. The composition so prepared is stated to be a non-conductor of heat, waterproof, and capable of resisting dry or moist heat, oils, acids, &c. It is also stated to be applicable for general building purposes, such as for building and paving blocks, tiles, and slabs, flooring planks, partitions, panels, mouldings, or carved work for walls, ceilings, &c., for making or lining cold chambers, refrigerators, &c. for ships or general purposes, for packing-cases for conveying perishable substances or explosives &c., as a substitute for earthenware for the manufacture of pans, mugs, pipes, &c., or as a substitute generally for india-rubber, gutta-percha, asbestos, leather, &c. It may also be employed as a packing for steam pistons, valves, shaft bearings, &c., in which case it may be mixed with French chalk, plumbago, or other antifriction material.

2660. Lemström, C. S. Feb. 6. Drawings to Specification.

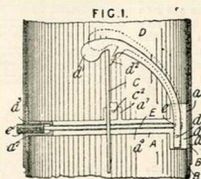
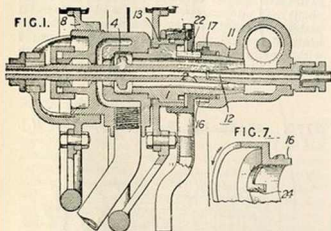
Heating air in electric machines. In order to keep the machine dry, it is arranged in a casing through which warm dry air is circulated. For this purpose, the air is withdrawn from the casing by the draught created by a lamp, and fresh air, dried by passing it over a hygroscopic substance, such as phosphoric anhydride, is allowed to enter through a chamber heated by the lamp. Air is

2822. Arlender,
F. Feb. 8.

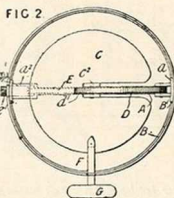
Boiling-pans for use in the manufacture of resinous soap. The boiler B is provided with a steam jacket reaching to about half its height, a false bottom F, and a manhole C.



being accidentally disengaged from the charging-orifice, it is formed with a slot 24, Fig. 7, into which a key 22 on the tube 1 is pushed as the tube 1 moves to the right.

3320. Rice, E. V. Feb. 14.

3282. Craig, J. Feb. 14.


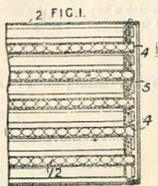
Heat-storing apparatus.—Consists of means for charging vessels or containers with air, steam, and hot water or the like under pressure, and is especially applicable for charging the heating-cylinders used with compressed-air motors, and particularly those for propelling vehicles. The outlet tube 2 is arranged within the charging-tube 1, and carries a valve 4 which controls the admission of the charge. In use, the ring 16 is first secured to the charging-orifice by means of a bayonet-joint 17. The ring 13, which screws into the ring 16, is then turned, moving the tube 1 to the right to make joint with the charging-orifice 11. The ring 8, which screws on the tube 1 and carries the tube 2, is then turned, moving the tube 2 to the right into contact with the discharge orifice 12, and at the same time opening the valve 4. To prevent the ring 16 from



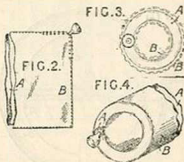
Thermostats.—Relates to dampers for stove pipes which are automatically closed at a predetermined temperature. A cross-bar A has flanges a, a' , which are adapted to rest in slots B' in the upper edge of the stove-pipe section B. The bar A has a slot a' communicating with a threaded hole a^2 in an enlarged end a^2 of the bar. The damper C is pivoted at c^2 to lugs a^2 on the cross-bar, and has one side heavier than the other. A latch D, pivoted at d to the lug a^2 , has a weighted end d' and a lip d'' adapted to engage the damper C when in the open position. An expansible bar E of brass &c. is laid in the slot a' in the cross-bar, and contacts at the inner end e with the latch D and at the outer end is fixed to an enlarged portion e^1 which screws into the hole a^2 . A stem F, secured to the damper, passes through the stove pipe and is provided with a handle G, whereby the damper may be turned into the open position, Fig. 1, where it is secured by the latch D. If the heat in the stove pipe becomes too great, the rod E expands sufficiently to raise the latch D and allow the damper to close. By adjusting the rod E through the screwed portion e^1 , the damper may be closed at any required temperature.

3332. Tattersall, W. Feb. 15.

Heating air.—A tubular air-heater is shown in Fig. 1. The cylinder 2 is fed with steam or other heating-medium. The air tubes 4 are fitted with spirals 12 to impart a rotary motion to the air. Non-conducting material 5 is filled in between the ends of the projecting tubes.



3355. White, E. Feb. 15.

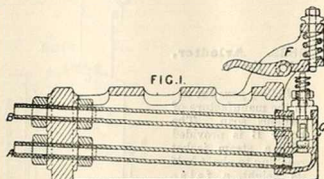


Hot-water bottles.—An air or water receptacle A is made of fine india-rubber which can be sterilized or scalded without injury. The outer cover B is of inflexible material, capable of being scalded without injury, and has a corner aperture through which the bag A can be inserted or withdrawn; the aperture can be laced up or otherwise fastened. The cushion can be used as a pillow, or as a hot-water bottle. Figs. 3 and 4 show a modified form, consisting of a cylindrical annular rubber bag A and inflexible cover B; this may be filled with air or hot water, and inserted in a lady's muff to warm it, or it may be covered with fur A and lined to form a muff itself.

3407. Ortman, V. C. J. Oct. 11, A.D. 1898,
[date applied for under Sec. 103 of Patents & Act, A.D. 1883].

Steam traps.—Relates to apparatus for extracting water of condensation from steam traps or for other purposes, in which a valve is actuated by the variation in expansion of metal tubes. In the arrangement shown in Fig. 1, the tubes are fixed at one end in the frame, the upper tube being less expandable than the lower tube. The water enters at A and leaves at B. The beam F supported on the frame operates and regulates the balanced

valve C. The stroke of the valve is regulated by the nuts and springs. In another and modified arrangement, the water tubes are of the same

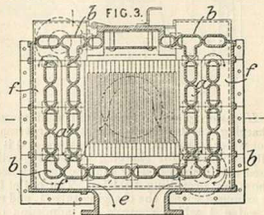


metal, and a central inclined stay of less expandable metal is provided.

3745. Knoch, P. Feb. 20.

Non-conducting coverings and compositions.—Corrugated non-conducting plates for roofs of railway stations, engine sheds, &c., or for sound-deadening and weather-excluding layers of walls, ceilings, &c., are made from felt or from superposed layers of fabric connected together. The plates are steeped in chrome-gelatin, and when about half dry pressed between heated metal plates with corrugated surfaces or passed through heated fluted rollers. The plates are then treated with acetate of alumina, the outside coated with asphalt, and the inside with oil paint.

3770. Haddan, R., [Schuppman, H].
Feb. 20.



Heating water.—A low-pressure boiler for steam or hot-water heating systems is composed of a series of hollow cast-iron columns a, b, connecting intercommunicating chambers at top and bottom and enclosing a fire-chamber in which solid, liquid, or gaseous fuel may be burnt. Fig. 3 shows a sectional plan. The two rows of columns on each

side form flue spaces f through which the products of combustion pass as shown by arrows, suitable openings being provided from the fire-chamber near the top. Additional flues f are formed between the columns at the side and back and an outer casing, these flues leading to the chimney outlet e .

3826. Platz, R. Feb. 21.

Non-conducting coverings and compositions.—A composition of sawdust, powdered chalk, and water-glass, with or without colouring-matter, is moulded to any required shape, and is, when set, of stone-like hardness, fireproof, waterproof, and a bad conductor of heat. It may be polished and lacquered, and may be used in the manufacture of toy building-blocks, plinths, pillars, isolating walls, floor and ceiling coverings, picture frames, inkstands, clock cases, trays, and other articles.

3940. Borchers, W. Feb. 22. *Drawings to Specification.*

Methods of heating.—Relates to a method of obtaining high temperatures for the production of calcium carbide, the reduction of refractory metals, and for other purposes. Carbonaceous fuel directly surrounding the substances to be treated, and in immediate proximity thereto, is burnt in air enriched with from 30 to 50 per cent. of oxygen, and previously heated to about 400° C. The combustion is regulated so that carbonic oxide is produced, without carbonic acid or water.

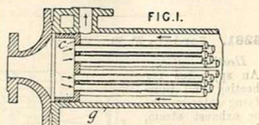
3970. Detsinyi, G. Feb. 22.

Methods of heating.—Relates to a method of heating in which combustible gases &c. in the presence of oxygen are conducted over potsherd, burnt or unburnt clay, bricks, calcined gypsum, meerschau, calcined bones, pumice, &c. saturated with catalytic agents, so that these materials are rendered incandescent after preliminary heating, and the gases &c. continue to burn but without ignition. The catalytic agents comprise salts of metals of the platinum group, manganese, or iron peroxide, &c. Salts of metals of the iron group, or of the earthy metals &c., may be used with the platinum salts, or for preliminary impregnation. Organic compounds may also be added. After saturation the materials are dried and rendered incandescent.

4109. Mattick, F. O. B. Feb. 24.

Heating liquids; heating gases.—Relates to heating-apparatus for liquids or gases with tubes which are withdrawable. The apparatus is shown in part in Fig. 1. The ends of the tubes are fixed in the head or plate c , adapted to slide tightly in the cylinder or casing g , and so allow for the expansion

or withdrawal of the tubes. The tube-plate at the opposite end of the cylinder may be similar to that

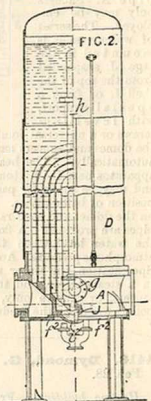


shown, or may be fixed. The heating or cooling medium may flow around or through the tubes.

4149. Chamberlain, J. G., and Player, R., [trading as Wright & Co., J.], and Radcliffe, J. Feb. 24.

Heating liquids.—

Relates to heaters of the "Berryman" type for water or other liquid. Fig. 2 shows an elevation, half in section. The chambers on each side of the casing A , from which the tubes open, are provided below with doors f^2 for giving access to the tubes for expanding them into the tube-plates and for cleaning them, and also for the removal of grease, which is intercepted in the first of these chambers when exhaust steam is used as the heating-medium. Water &c. to be heated enters at g , and is removed through the pipe h . The space between the tube-plates is also provided with a door D , to give access to the interior of the casing D and the exterior surfaces of the tubes. A sludge cock J is provided.



4201. Archibald, J. Feb. 25.

Non-conducting coverings.—Relates to non-conducting coverings for steam pipes, boilers, and the like. The covering is shown in section in Fig. 2. Ground cork is packed between the pipe or body and a steel or other metal casing A . The edges of

