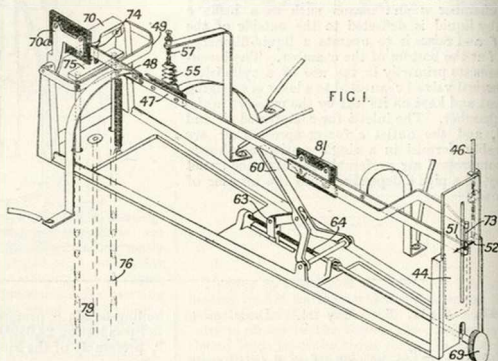


screw 34 has a pointer moving between stops 40. In a modification shown in Fig. 3, a rod 43 of copper forms the expansion element, and operates

the valve through a lever 44 with hook like bearings 46, the lever having a screw 45 engaging with the lever 42. A spring 41 opens the valve.

12,740. Freas, T. B. May 31.

Thermostats. — In an electrically-heated oven for use in chemical laboratories or as a bacteriological incubator, a thermostat is used having an expansion member controlling a contact arm co-operating with an adjustable contact-arm, one of the two arms being insulated from its pivot. As shown, the arm 48 carrying a contact 73 is mounted on, and insulated from, an arm 70a on a rocker plate 70 pivoted on a pin, which also forms the pivot for a yoke 49 carrying the adjustable contact arm 47. The plate 70 is rocked by means of a pin 74 mounted on a plate 75, to which the upper ends of two perforated brass tubes 76 are secured, the lower ends being mounted on a plate secured to a rod 79 of non-expanding material such as invar. The contacts 73, 51 on the arms 48, 47 are arranged in front of a scale 44 adjustable by means of a screw 46. The arm 47 carries a pointer 52 and is adjustable by means of a milled head 69, screw 64, block 63, and lever 60. The arm 47 is made in two parts separated by

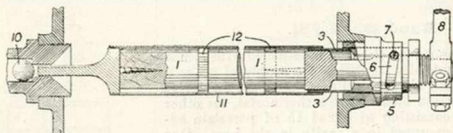


insulation 81, and a flexible contact 55 is mounted on and insulated from one part so as to engage with a fixed contact 57, to connect in circuit a second heater when the arm 47 is adjusted to a higher temperature, the second heater being controlled in the same way as the main heater. Condensers are connected across the contacts to prevent sparking. Specification 25,962/11 is referred to

12,993. Still & Sons, W. M., and Adamson, A. G. June 4. [Addition to 29,285/12]

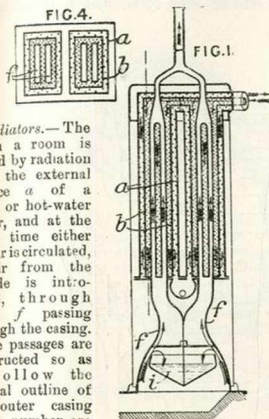
Radiators; thermostats.

—In a radiator as described in the parent Specification, the rod for controlling the ball valve is made adjustable longitudinally and adapted to be operated from within the railway-carriage &c. to be heated. The rod 1 is mounted in a sleeve 3 which can rotate and slide in a casting 5 attached to the radiator, and is provided with a handle 8 whereby it can be turned. The motion of the rod is regulated by a pin 7 moving in a spiral slot 6 in the casting 5. The slot 6 is of such length that the valve 10 is always



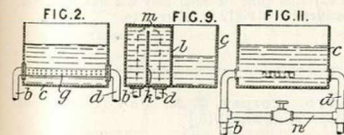
off its seat when the radiator is cold and cannot be opened above a certain amount when the radiator is at the maximum desired temperature. The rod 1 is surrounded and protected by a metal tube 11 sliding on the sleeve 3. In the tube 11 are supports 12 for the rod.

- 13,257. **Watzke, F.** June 10, 1912, [Convention date].



Radiators.—The air in a room is heated by radiation from the external surface *a* of a steam or hot-water heater, and at the same time either the air is circulated, or air from the outside is introduced, through ducts *f* passing through the casing. These passages are constructed so as to follow the general outline of the outer casing and a number are used to increase the inner heating-surface. Baffles *b* may be used to guide the heating-medium substantially in counter-current. An air moistener and dust-trap *i* may be fitted.

- 13,336. **Wheeler, A. E.** June 9.



Heating by circulation of fluids.—In hot-water heating-systems, the flow pipe from the boiler is connected to the distributing-pipe by a tube with openings or branches communicating with the expansion tank. The tube may be formed by an arrangement of partitions in the expansion tank. Fig. 2 shows an arrangement in which the flow pipe *b* and distributing-pipe *d* are connected by a perforated pipe *g* passing through the expansion tank *c*. Various arrangements of the pipe *g* are described, in some of which the perforations are replaced by slots, or spaces between different sections of tube. In the form shown in Fig. 9, the tube is formed by partitions *k, l* in the tank and a cover *m*. The partition *l* is perforated. In the form shown in Fig. 11, the pipes *b, d* open into the tank *c* and are connected by a pipe *n* outside the tank.

- 13,881. **Voorhees, G. T.** June 16. Drawings to Specification.

Heating-systems.—Waste steam or other vapour to be employed for heating is compressed until its temperature of liquefaction is greater than the temperature of the substance to be heated.

- 14,058. **Schön, L.** June 18, 1912, [Convention date].

Non-conducting coverings for heat.—Previous to the application of a heat non-conducting composition to boilers, pipes, &c., the latter are coated with a fatty substance, such as stearine, or with a hydrocarbon, such as paraffin or kerosene. Upon this, a fabric is applied which becomes soaked in the grease. After applying the non-conducting composition, the latter is coated with varnish, resin, or rubber solution.

- 14,059. **Schön, L.** June 18, 1912, [Convention date].

Non-conducting coverings for heat.—In order to facilitate the removal of non-conducting coverings from steam-pipes, boilers, &c., there is placed between the covering and the surface to be protected a layer of greasy substance, such as oil, wax or paraffin, or soap containing such materials. A cloth or the like saturated with the greasy substance may be employed.

- 14,182. **Potter, N. J.** June 19.

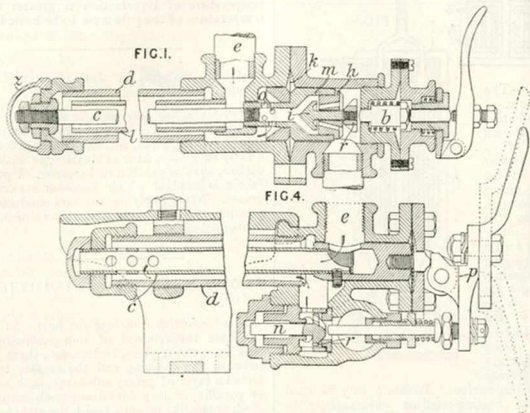
Fire-proof coverings.—Relates to impervious and non-inflammable coverings for the steel plates for ships' decks &c., of the type consisting of a layer of bitumen &c. and a layer of cement formed with magnesite, magnesium chloride, &c., and consists in a construction whereby cleats for securing the covering are dispensed with. The lower layer, which consists of mineral rock asphalt, or a composition containing it, attached to the plate by bitumen, is formed with grooves or indentations whereby the cement layer is bonded to it. The grooves may be replaced by pieces of broken stone, gravel, &c., or other means for roughening the surface of the asphalt layer may be employed.

- 15,034. **Lawson, J.** June 30.

Steam-traps.—Differential expansion members are arranged so that at the moment the valve commences to open the steam contacts first with the member tending to open the valve, and at the moment of closing the steam also contacts with the member tending to close the valve. In the arrangement shown in Fig. 1, an iron rod *c* carrying at one end a valve *i* and a ported seat *h*, is mounted at the other end on a brass tube *d*, and is separated therefrom by a tabular partition *l*.

Water and steam enter at *e* and contact first with the rod *c*, and then with the tube *d*, and pass through perforations *o* in a valve box *m* mounted on the rod *c*. A diaphragm *k* separates the inlet

from the outlet side of the trap. The partition may be perforated, and may be provided with a gauze liner to collect dirt, in which case the cap *z* may be replaced by a cock. The valve, as shown,



opens against the steam pressure, but it may be arranged to open with steam pressure, or two valves may be used. The valve co-operates with an adjustable abutment *b*, and may be fitted with vanes *r* for causing rotation. The valve and seating may be carried by the fixed member, or one by each member. In the arrangement shown in Fig. 4, the rod is replaced by a perforated tube *c*, the

partition being dispensed with, and the valve *n* is mounted out of alinement with the expansion members, and may be operated by a link *p*. The slots forming the vanes do not pass through to the back of the collar *r*, so that the back forms a piston. An external tube or shell may act as a reservoir. Specification 8,90/12 is referred to.

15,856. Hill, T. July 9.

Thermostats.—The damper 24 covering the opening 23 in the top of an incubator is connected by a wire &c. 25 to a lever 26 pivoted to the turn-screw of the oil or gas lamp 20 to regulate the flame of the lamp.



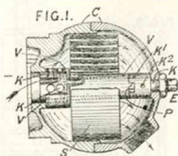
15,975. Torpey, J. A. July 11. [*Cognate Application*, 21,501/13.]

Non-conducting coverings for heat.—Insulating coverings for refrigerator chambers &c. are formed of slabs consisting of a layer of granulated cork, charcoal, slag wool, or silicate of cotton, impregnated with a binding-agent and consolidated, and a layer of pumice, asbestos, or concrete. The layers are displaced relatively to each other, so as to break joint when the slabs are assembled, the slabs being united by bitumen or a cement run in between the joints. To increase the insulation, a double layer of the cork or other slabs may be united by bitumen. The structure built may be coated with water-proof or other cement.

16,179. Jerram, A. E., and Barclay, W. R. July 14.

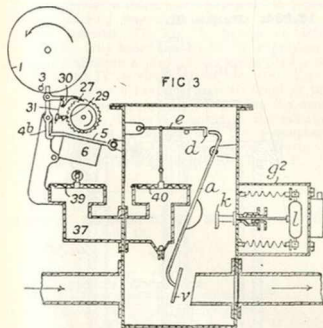
Thermostats.—A bimetallic strip *S* mounted in a

casing C controls a valve consisting of a ported sleeve V and stem K, the sleeve being slotted to receive one end of the strip and provided with a projection P, which moves between abutments on a



collar K¹, secured by a pin K² to the stem K. The thermostat is set by adjusting the stem, which for this purpose is screw-threaded and provided with a squared head E, the stem and sleeve being moved together to vary the tension in the strip. The strip is arranged as shown with a number of concentric turns for the passage of a heating-medium to a radiator.

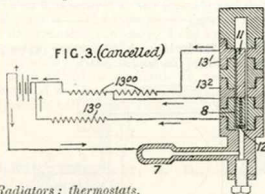
16.187. Arndt, M. July 15, 1912, [Convention date].



Heating buildings.—In connexion with a system for supplying heat by means of steam, hot water, hot air, &c. there is arranged a device whereby, when a certain quantity of heat has been supplied, the heating-fluid is cut off and the supply can only be restarted after opening an enclosure controlled by a coin-freed or like device. In connexion with the radiators are arranged vessels containing expansible fluid connect d with recording and counting apparatus so that the amount of heat supplied as measured by the expansion of a fluid controls the rotation of a disk 1. The supply of heating-fluid is controlled by a valve v carried on a pivoted arm a. In the form shown, the valve v is

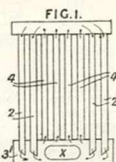
normally held open by a catch d on a pivoted arm e. A stud 3 on the disk 1 comes against a lever 4^b, thus releasing a bar 5 carrying a weight 6. The weight 6 falls on a flexible diaphragm 39 closing one end of a passage 37, and the puff of air transmitted along this passage raises a second diaphragm 40 connected to the arm e. The arm a is thus released and the valve v closes by its own weight. To reopen the valve v, it is necessary to press a handle l connected to a plunger k. The handle l is enclosed in a casing g² with a door closed by a coin-freed lock, so that the valve can only be reopened after placing a coin in the lock. The movements of the lever 4^b are recorded on a card on a drum 29 by means of a pen 31. The drum is turned by a pawl 27 attached to the lever 4^b, which also carries the pen 31. To prevent the pen from leaving a continuous trace on the card, it is held off the card by a projection 30 on the pawl 27 so that it only touches the card as the pawl reaches the end of its movement. Modifications are described in which the pneumatic release described is replaced by mechanical and electro-magnetic devices.

16.485. Lacasse, V. July 17, 1912, [Convention date].



Radiators; thermostats.—A radiator of the type heated by gas, electricity, &c. is formed of two headers connected by tubes so arranged that the heated liquid in the radiators passes up some of the tubes and down the others. An electric or other heating-device X is placed in or below the lower header 3' and the tubes 4 directly above it open into the header 3' at its upper surface. The other tubes 2 at the sides pass down nearly to the bottom of the header 3' and open there, being bevelled off as shown. The radiator is filled with oil or other body of high boiling-point.

The Specification as open to inspection under Section 91 (3) (a) states that the tubes 4 may open into the top of the header 3', being separated from the tubes 2 and the heater X by a partition extending from the top of the header 3' to near the bottom. It also describes an electrical temperature-regulating device. A bulb 7, Fig. 3 (Cancelled),

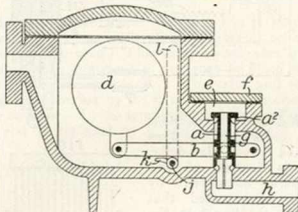


placed in the radiator header contains mercury and is connected with a chamber 8 containing a piston with metal ends 11, 12 connected together and with an insulating middle part. The current passes through the bulb 7 and resistances 13⁹, 13⁰⁰ in parallel. The resistance 13⁰⁰ consists of two portions connected to plugs 13⁴, 13² in the walls of the chamber 8 touching the end of the plunger so that the two portions of the resistance are in parallel. When the plunger rises owing to expansion of the mercury, the insulating portion of the plunger comes opposite to the plug 13² and the two portions of the resistance 13⁰⁰ are in series. This subject-matter does not appear in the Specification as accepted.

16,925. Böttger, C. W. July 23.

Heating-apparatus.—In heating, drying, and distilling apparatus, bakers' ovens, &c. in which closed tubes containing a liquid are used, one end of the tube being placed in a furnace &c. and the other in the space to be heated, the tubes are filled with naphthalene or with a mixture of naphthalene and other hydrocarbons having a molecular constitution of the ring type, free from oxygen, and having a critical temperature above that of water.

17,179. Bühring & Wagner Ges. O.
Sept. 6, 1912, [Convention date].

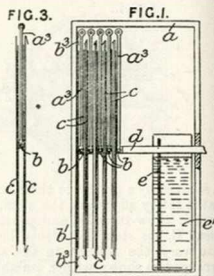


Steam-traps.—A double-seated valve, operated by a float *d* and lever *b*, has an upper valve-seat *a*² arranged in a space connected to the discharge *h* by a passage *g* through the valve. A removable cover *f* may be of iron or other metal, but is preferably of glass to allow inspection of the working. The lower valve seat may be cleaned by inserting a tool through the passage *g*. The valve may be opened to blow through by raising the lever *b* by a lug *k* on a shaft *j* operated by an external lever *l*.

17,621. Malone, J. F. J. July 31.

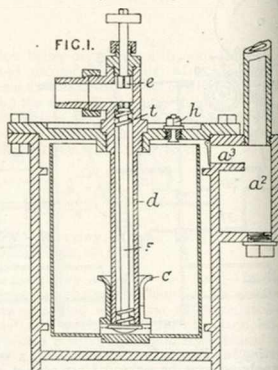
Thermosats.—A number of bimetallic strips *c* are connected together in pairs at their ends and are supported at the centre by pivoted rods *a*², the movement resulting from the bowing of the

strips being transmitted by a rod *d* to a vibrator. As shown in Fig. 3, some of the strips are bent over to engage with the adjacent strip. The end strip *b*¹ is secured by plates *b*² to the



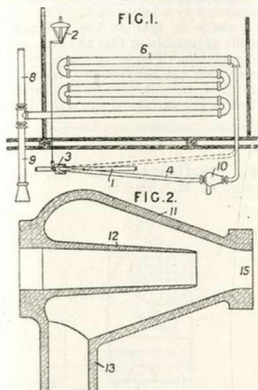
casing *a*. The rods *a*² are pivoted to blocks *b* attached to the strips. A vibration-damper consists of a perforated plate *e* secured to the rod *d* and dipping into liquid *e*¹.

17,834. Perks, H. Aug. 5.



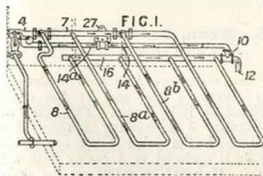
Steam-traps.—A bucket trap has a valve stem *d* arranged in a depending tube *d* which can be unscrewed so as to allow the stem to be moved sideways in a slot in a fitting *c* on the bucket, and then removed without lifting the cover of the trap. The stem has an enlarged head which engages with the fitting *c*, and a worm *t* to produce radiation of the valve when discharging. The trap is provided with a valve-cleaning rod *e*, an air-valve *h*, a check-valve *a*², and a sediment chamber *a*¹. According to the Provisional Specification, the valve may be mounted on the lower end of the stem,

8,729. **Bousfield, J. E.**, [*Pintsch Akt.-Ges., J.*]. Aug. 18.



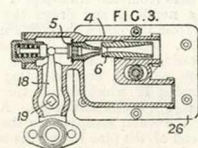
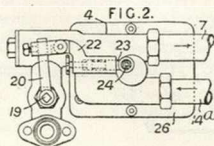
Heating by circulation of fluids; steam-traps.—In a low-pressure steam heating-system, the steam, before entering the radiator, passes through a conical chamber 11, Fig. 2, having an inlet nozzle 12. Any water formed in the supply-pipe drains off through a pipe 13, the steam passing on to the outlet 15 by virtue of its velocity. Fig. 1 shows a radiator 6 having a trap 10 fitted at the bottom of a sloping pipe 4 leading from the main supply-pipe 1. Water condensed in the radiator and superfluous steam pass to the atmosphere at 9, 8 respectively. Admission of steam is controlled by a valve 3 operated by a device 2.

18,731. **Bousfield, J. E.**, [*Pintsch Akt.-Ges., J.*]. Aug. 18.



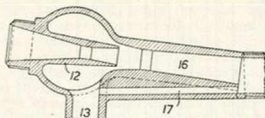
Heating vehicles; thermostats.—In low-pressure steam heating-apparatus for railway carriages, the steam inlet is regulated by a valve operated by the expansion of the last pipe section of the circulation system, the water of condensation escaping at the beginning of the section and the steam being entrained by an injector operated by the incoming steam. Steam enters the system by a valve

casing 4 and a pipe 7, passes through heating-circuits 8, 8^a, 8^b, and returns by a pipe 16 to a fitting 10, whence the water of condensation escapes by an outlet 12. The steam then passes



by a pipe 14, 14^a to the casing 4. The casing 4, which contains the seating of the valve 5 and an injector 6, is secured to the pipe 14^a and slides on a bed-plate 26. The pipe 14^a is fixed at 27, so that, by its expansion, the casing 4 and valve seating are moved up towards the inlet valve 5. The valve 5 is adjustably connected to the plate 26 by means of arms 18, 20 on a spindle 19, the arm 20 being connected to the plate 26 through a lever 22, an adjustable bolt 23, and an eccentric 24.

18,825. **Bousfield, J. E.**, [*Pintsch Akt.-Ges., J.*]. Aug. 19.

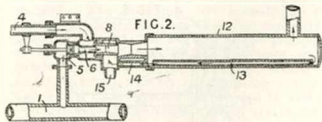


Steam-traps.—A trap of the kind described in Specification 18,729/13 is provided with a long constricted steam outlet 16, the end of which is connected to the water outlet 13 by a passage 17. The inlet nozzle 12 may also be constricted. The constrictions produce an increased suction which prevents escape of steam at 13, and the passage 17 carries away any water carried along by the increased steam velocity.

18,826. **Pintsch Akt.-Ges., J.** March 27, [*Convention date*].

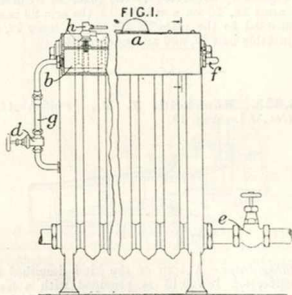
Heating vehicles.—In a steam heating-installation for railway carriages, to prevent the outlet for

water of condensation from becoming frozen up, the water is withdrawn from the system by an injector operated by the incoming steam, is separated from the steam, and escapes through an outlet not



directly connected to the end pipe of the system. The steam passes from the train-pipe 1 through a valve 5 to a nozzle 6 and draws the water of condensation from the pipe 4 through a nozzle 8 to a separator 12. The separator 12 consists of a cylindrical casing with an internal pipe or partitioned-off space 13, not extending to either end of the casing 12, which directs the separated water to a pipe 14 and outlet 15. Any steam entrained by the water escapes into the casing 12 between the end of the pipe 13 and the wall of the casing, or is drawn off by the injector action of the jet emerging from the nozzle 8. The valve 5 may be connected to the pipe 6 so as to be closed by the expansion thereof.

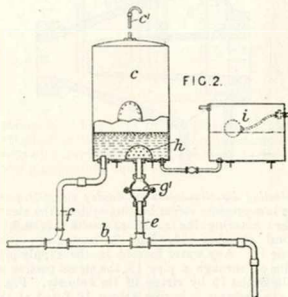
18,989. Hart, J. A. Aug. 20.



Radiators.—A trough containing water to be evaporated is so arranged in connexion with a water-heated radiator that a portion of the hot water supplied to the radiator heats the trough to increase evaporation, the arrangement being such that the supply of water heating the trough can be regulated independently of, and also proportionately to, the supply to the radiator. In the form shown, the portion *b* of the trough *a* containing the heating-water is connected to the radiator in parallel by pipes *f, g* which also serve to support the trough. A valve *d* in the pipe *g* allows of the regulation of the supply to the trough independently of the supply to the radiator,

while the supply to both is controlled by the ordinary control valve *e* of the radiator. Water is supplied to the evaporating-portion of the trough from the heating-portion by a ball-cock *h*. The trough may be of V-shape in section, the ball-cock *h* then being made adjustable so that the evaporating area may be regulated. The trough is placed near the radiator so that the convection-currents from the radiators flow past it. These currents may be directed on to the surface of the water by baffles.

18,916. Shillington, T. F., and Armstrong, C. D. Aug. 20.



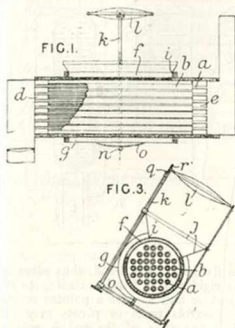
Heating buildings.—In a low-pressure heating system, the flow-pipe *b* is connected to an expansion tank *c* by branch pipes *e, f*. Any steam or air rising from the pipe *b* is broken up by a perforated disk *g'* placed in an enlarged portion of the pipe *e* and by a perforated hood *h*. The expansion tank is provided with a vent-pipe *c'* and is connected to the usual supply tank *i*.

18,998. Kenn, O. Sept. 9, 1912, [Convention date]. No Patent granted (Sealing Fee not paid).

Solar heat, utilizing.—A tubulous boiler is heated both by means of fuel and by the sun's heat concentrated on it by lenses. The boiler consists of water-tubes *b* connecting headers *d, e* and concentric with the tubes *b* are smoke-tubes *a*. The whole is enclosed in a casing with a glazed opening *f*. Mounted to rotate on the casing is a ring *g* carrying a pivoted frame *k* which can be turned by a rack and pinion *o, n*. The frame *k* carries a lens *l* and is moved by hand or clockwork to follow the motion of the sun. The lens *l* is pivoted and can be turned by gear *g*. The ring *g* carries reflectors *i*. The lens *l* may be attached directly to the ring *g*.

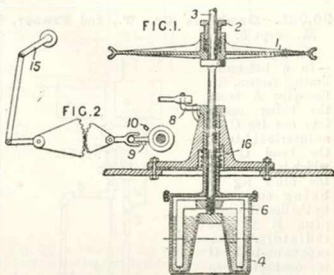
(For Figures see next page.)

18,998.



in the levers 11, 5, allow of adjustment of the position of the link 10. The rod 12 carries a bar 18, Fig. 4, which is forked to receive a chain-wheel 20, the spindle of which engages with a slot 24 in a rod 19 pivoted to the ventilator 23. To prevent movement of the ventilator by the wind, a weighted chain 25 passing over the wheel is connected with a fixed support 26. Wind pressure causes the ventilator to be lifted and the rod 19 to be raised until a catch 31 engages with the teeth of the wheel 20 to prevent further movement, the tension being taken up by the chain. The weight 28 may be varied to regulate the temperature at which the ventilator is operated.

19,399. Kendall, E. D. Aug. 27.

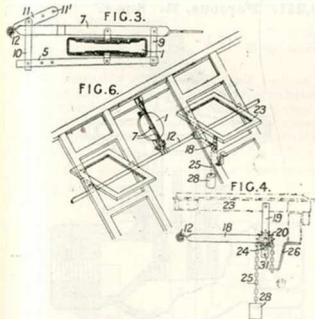


Thermostats.—The apparatus is designed for cutting-off the supply of light fuel to an internal-combustion engine and turning on heavy fuel after the engine has started, but it may be used for other purposes, such as controlling the ignition. It comprises a vessel 4 containing fusible liquid and arms 6 on a spindle 3 which tend to rotate therein. The engine, when started, turns the spindle through a pulley 1 and friction clutch 2, and the arms carry with them the vessel 4 until an arm 8 on its hollow journal is arrested by a stop 10, Fig. 2. This movement is transmitted by the mechanism shown in Fig. 2 to a three-way cock 15, causing it to supply starting-fuel to the engine. When the heat of the engine is sufficient to melt the metal, the box 4 is moved back by the spring 16 until its arm reaches the stop 9, and the cock 15 turns off the starting-fuel and turns on heavy oil.

19,980. Wild, A. G. Sept. 4.

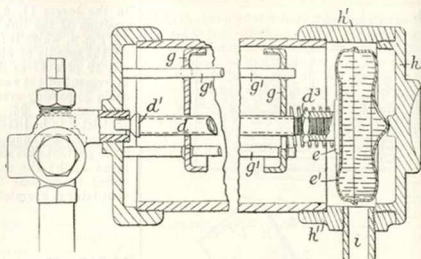
Radiators; thermostats.—The supply of steam to a radiator for heating railway carriages &c. is controlled by a valve operated by an expanding capsule placed at the exhaust end of the radiator and connected to the valve by a rod or

19,312. Notenboom, A., and Notenboom, J. Aug. 26.



Thermostats.—A capsule thermostat for controlling the ventilators of a hot-house is jointed at the centre of the sides to two rods, one fixed and the other pivoted so that the sudden movement of one or both sides is transmitted to a rod operating the ventilators. The capsule 1, Figs. 3 and 6, may contain a volatile liquid, such as carbon bisulphide, alcohol, or ether, and the sides may be grooved and adapted to buckle at different pressures so that the window is opened in two steps. The capsule is secured to two fixed bars 7, and to two bars 5 which are connected by a pivoted link 9 to the bars 7, and by another link 10 having a forked upper end with a lever 11 secured to a pivoted rod 12. Holes 11

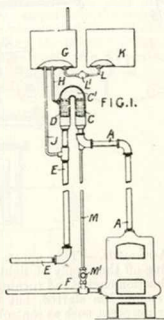
tube running the length of the radiator. The tube d which carries the valve d' is adjustably screwed into an extension on the capsule e' and secured by a lock-nut d^3 . The capsule e' is placed in a tubular extension h' attached to the radiator and also carrying the exhaust pipe i , and is held in place by a screwed cap h . The tube d passes through perforated guides g supported by rods g' .



20,081. Danks & Co., T., and Fraser, R. Sept. 5.

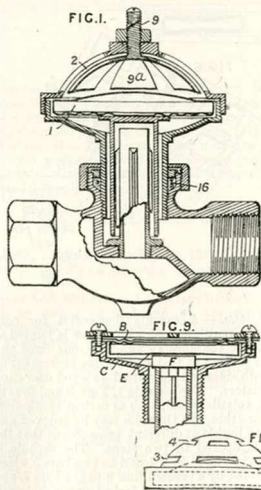
Heating buildings.

—In a hot-water heating-system, the flow-pipe A from the boiler opens into one leg C of an inverted U-tube, the bend C' of which is full of air, the other leg D being connected by the distributing-pipe E to the radiators. The expansion-tank G is connected to the leg D of the U-tube just below the bend by a pipe H , and to the pipe E by a pipe J . Make-up water passes to the tank G from a tank K by a pipe L and non-return valve L' . The flow pipe A may be connected to the return pipe F by a pipe M which may be closed by a valve M' when the apparatus is fairly in action. In a modification, both legs of the U-tube are connected to the pipe E .

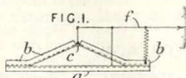


away the flanges at the bend, thus allowing the otherwise rigid rod to bend according to changes of temperature and actuate a pointer or contact-lever f . Flexible parts or pivots may also be provided at the ends of the rod b , where it is attached to the rod a . Two such devices may be connected to the same pointer or lever, their relative positions being adjustable by a screw.

20,221. Parsons, R. Sept. 8.



20,085. Siemens Schuckertwerke.
Sept. 5, 1912, [Convention date]. Void. [Published under Section 91 of the Act.]



Thermostats.—Two rods a, b of different metals and of U-shaped or like cross-section are connected together at their ends, and the bent rod b is provided with a flexible part c formed by cutting

Steam-traps.—A capsule containing a volatile

liquid is provided with means either for reducing or increasing its sensitiveness. As shown in Fig. 1 in which the capsule 1 is exposed to the atmosphere, a cap 2 is provided with apertures the size of which can be adjusted by means of a shutter 9^a mounted on a screw 9 and arranged above or below the cap, so as to reduce the effect of the atmosphere on the capsule. In the modification shown in Fig. 2, the apertures 4 at the top of the cap are made smaller than those 3 at the base. In another arrangement, circular plates are secured to or cast on the outside or inside of the capsule, and

the spaces between the plates, or between the ribs of a corrugated surface, may be filled with heat-insulating material. In the arrangement shown in Fig. 9, in which the capsule C is covered by a disk B, the capsule is made more sensitive by forming the flat centre of the top of extended area to bear against a corresponding surface on the disk. The diaphragm E forming the base of the capsule bearing against the valve F is made rigid. To prevent leakage, the valve casing is provided with a stuffing-box 16, Fig. 1. Specifications 20,932/99, 8634/02, 25,653/04, and 19,362/14 are referred to.

20,669. Nanquette, L. Sept. 12.

Heating by circulation of fluids.—In a system for heating vegetable oils, such as colza or castor oil, by the circulation of liquids, mineral oils or benzene are used as the circulating medium. A special form of boiler for heating the oil and a special form of heater in which the oil is used to heat other liquids are also described. Fig. 1 shows a system of piping &c. suitable for the invention. The oil is heated in a boiler *b* with a return flue as shown and passes by a flow-pipe *l* to the heating-devices, consisting of jacketed vessels such as *d*, tubular or other liquid-heaters such as *f*, or radiators. The oil returns to the boiler *b* by a return pipe *c*. The flow and return pipes are laid to a uniform slope as shown, and an expansion tank *e* is provided. The boiler *b* is formed in cross section as shown in

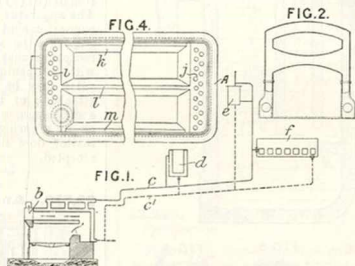
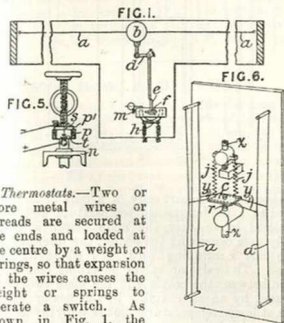


Fig. 2, the faces of the flue being curved. Fig. 4 shows a heater for liquids. In a tank A containing the liquid to be heated is placed the heater consisting of headers *i, j*, perforated by tubes and connected by portions *k, l, m*.

21,138. Frank, H. Sept. 18.



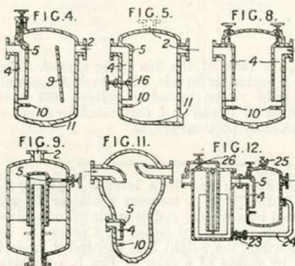
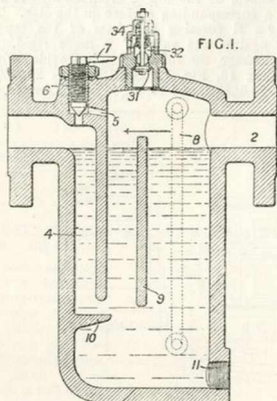
Thermostats.—Two or more metal wires are secured at the ends and loaded at the centre by a weight or springs, so that expansion of the wires causes the weight or springs to operate a switch. As shown in Fig. 1, the weight *b* is secured to

several wires *a* and to a lever *d* engaging with a projection *e* on a mercury container *h*, which is loaded by a weight and is mounted on a pivot *f* adjustable in a slot by means of a screw *m*. In a modification, the weight *b* is suspended from the wires by means of a rider *n*, Fig. 5, on which is mounted a box *p* having a contact *t* engaging with a contact *s* on an adjustable bell-shaped part *p*¹, which dips into mercury in the box *p* to form a seal. The box may contain hydrogen to prevent sparking. In the modification shown in Fig. 6, two sets of wires *a* are connected together by a third wire *y* supporting a rider *c* with adjustable loading-springs *j* and a contact *r* engaging with a fixed contact adjustable by means of a screw *z*.

21,145. Roschank, O. Sept. 18, 1912. [Convention date].

Steam-traps.—Apparatus for increasing the amount of liquid discharged at each operation of a float-controlled discharger, such as a steam-trap, consists of a closed vessel with a partition between the inlet and outlet and a small opening in the

partition. The opening allows of the accumulation of liquid in the vessel and of its overflow into the trap, but is not large enough to prevent the blowing out of the liquid when the trap opens.

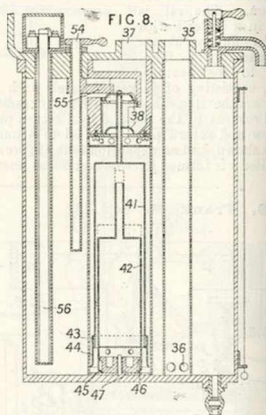


In the form shown, the passage 5 between the inlet 2 and the outlet pipe 4 is controlled by an adjustable valve 6 with a pointer 7 and scale. A baffle 9 prevents whirling of the liquid, and a baffle 10 prevents the escape of mud, a tap 11 being provided for removing the latter. A gauge-glass 8 may be fitted. An air-discharge valve 31 is controlled by a spring 34 which is protected by a cup 32. In the modification shown in Fig. 4, the opening 5 is controlled by a valve which, in addition to being adjustable by hand, is automatically regulated by the expansion of its stem, which is of different material from the vessel. The opening may also be regulated by differences of pressure or by a liquid seal. In the form shown in Fig. 5, an additional opening is controlled by a valve 16 to regulate the amount of liquid discharged. A symmetrical form of the apparatus is shown in Fig. 8, and a form suitable

for connexion to a vertical pipe is shown in Fig. 9. The apparatus may be combined with a steam-separator as shown in Fig. 11. An additional connexion 24, Fig. 12, between the reservoir and the steam-trap may be provided for the purpose of blowing through the latter. On opening the valve 23 and the air-discharge valve 25, water passes from the trap to the reservoir and allows the bucket to drop; or by opening a valve 26 in the trap, the reduction of pressure may cause water to pass from the reservoir to the trap and open the latter. Two or more reservoirs may be arranged in series, or one reservoir may serve several steam-traps.

The Specification as open to inspection under Section 91 (3) (a) comprises also the following matter. The apparatus consists of a U-tube with a cross-connexion controlled by a valve at the top; a mud trap may be arranged in the loop. Or a closed receptacle may be divided by a central partition with an opening near the top. The air-discharge valve may be of spherical form with a weight attached; or the valve may be mounted upon a diaphragm with adjustable apertures and acted on by a spring or weighted lever. This subject-matter does not appear in the Specification as accepted.

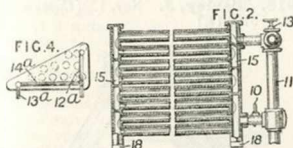
22,210. Anderson, J. Oct. 2.



Thermostats.—A part only of a bulk of liquid is heated to a predetermined temperature and then permitted to re-enter the main vessel, a fresh supply then occupying the heater, the intermittent operations continuing until the whole bulk is heated. The valve or valves governing communication between the heater and the main vessel are operated by an air chamber in the heater which sinks at lower temperatures but is buoyant at the predetermined temperature. The valve or valves may regulate the outflow of hot water from the

heater, or the inflow of the colder water, or both, and the sectional heater may be within or separate from the reservoir. Fig. 8 shows a practical adaptation of a separate heater. The hot-water outlet 37 is controlled by balanced valves 38 operated by a float 41 open at the bottom and surrounding an inner air chamber or float 42 open only at the top. The outer float has weights 43 and a telescopic sleeve 44 for adjustment. In operation, the outer float and valves rise but the inner float 42 remains down until water enters the annular space between the floats and lifts the inner float also. Cold water flows in from the inlet 35, 36 and on reaching the floats, the air contracts and the inner float rises until the flange 45 meets the shoulder 46 on the weight 47. Further cooling causes both floats to sink and close the valves. As the water heats up under the operation of the heater 56, for example an electric heater, the floats and the valves 38 rise again and the hot water escapes through the outlet 37. Provision is made for holding the valves down during adjustment, by a finger 55 the spindle 54 of which is hollow and can contain a thermometer. The apparatus may be used in conjunction with or in place of an ordinary range heated hot-water supply system.

22,501. **Smith, C. H.** Oct. 6.

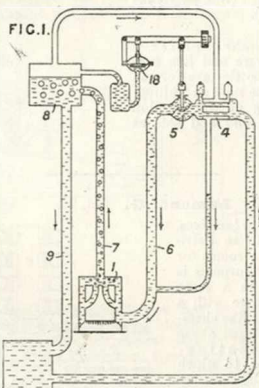


Radiators.—A radiator comprises superimposed rows of horizontal tubes communicating with baffled end members 15, a two-way valve 13 at the entrance controlling a by-pass 11 and a drainage cock 10 near the exit. Lateral feet 18 on the end members are provided with holes for securing the apparatus in position. Fig. 4 shows a modified construction forming a foot-rest, and having an inlet pipe 12, discharge pipe 13, and by-pass 14.

22,525. **Reck, A. B.** Oct. 6.

Heating buildings.—In hot-water heating-systems in which the circulation is produced by mixing the water in the rising pipe with steam, the flow of water through the main circuit of the circulating-system is regulated according to the pressure or temperature of the steam separated from the water, or of the water on the flow side of the apparatus. The water is heated and mixed with steam in the heater 1 and the mixture rises up the pipe 7 to the chamber 8, where the steam and water are separated. The water passes by the pipe 9 to the circulating-system and the return-pipe 6, and the steam to a condenser 4 cooled by the circulating water. The chamber 8 is in communication with a diaphragm 18 operating a valve 5 in the return pipe 6, so that the higher the pressure and temperature in the chamber 8 the greater the flow

through the pipe 6. A modification is described in which the water is heated by steam supplied from a boiler.

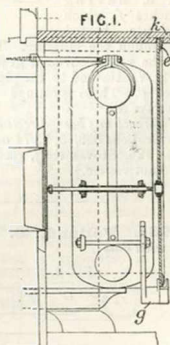


23,249. **Deek, M.** Oct. 14. *Drawings to Specification.*

Treating by chemical action and molecular combination.—Water used for rinsing out beer pipes and fittings is heated by passing it through a coil of pipe surrounded by calcium carbide, on to which water is dropped. The heat generated serves to heat the water, and the acetylene produced is burnt at a jet to prevent escape to the atmosphere.

23,528. **Nesbit, D. M., and Ashwell & Nesbit.** Oct. 17.

Radiators.—A radiator is provided with a case or guard affixed to the wall of the room &c. to be heated, both the radiator and the guard being clear of the floor so as to leave room for cleaning &c. The guard consists of a frame covered with lattice-work, expanded metal, &c., and adjustably supported from the radiator by brackets *g*. The cover of the guard may be formed by a slate or like slab *k*, which may be supported from a window sill.



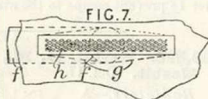
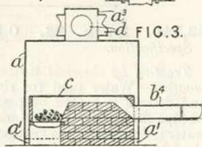
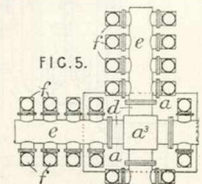
23,896. McCullagh, J. Oct. 22. *No Patent granted (Sealing fee not paid).*

Hot-water bottles.—Stoneware and like hot-water-bottles are formed with the neck and filling-opening at the junction of the end and side as shown.



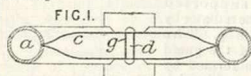
23,906. Lamond, G. Oct. 22.

Heating buildings.—Air to be distributed to rooms for heating purposes is heated in a stove or furnace with a dome or like chamber arranged above the heating-chamber, to which the distributing-pipes are connected. The heating-chamber *a* stands on feet *a'* and encloses a furnace with a closed top *c* and a flue *b'* leading out through the back of the chamber *a*. At the top of the chamber *a* is a second chamber or dome *a''* with connexions *d*, to which may be attached closed pipes *e*, Fig. 5, having branches *f* which distribute heated air through the building. The air may be passed into the rooms through gratings *h*, such as shown in Fig. 7, attached to the pipes *f* by flaring mouth-pieces *g*. These gratings may be placed near doorways &c.



Reference has been directed by the Comptroller to Specifications 833/73, 73/74 and 22,010/91, [both in Class 126, Stoves &c.], and 14,888/01, [Class 79, Locomotives &c.].

23,960. Volland, E. Oct. 23, 1912, [Convention date].



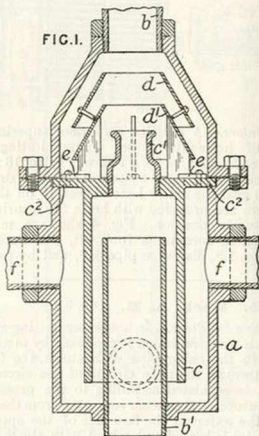
Radiators.—To increase the heating-surface of a radiator, elastic metal plates are sprung into the

spaces between the tubes of the radiator elements. Fig. 1 shows a cross-section of such an arrangement, the plates *c* engaging with grooves in the tubes *a*. The plates *c* are drawn together in the middle by bolts *d* surrounded by spacing-pieces *g*. Openings for circulation of air are formed in the plates *c*, which may be welded to the tubes *a*.

24,827. Frank, H. Oct. 31.

Radiators.—Relates to liquids for filling radiators to be heated by gaseous, liquid, or solid fuel, steam, or electricity. A volatile liquid or solid of low specific heat is mixed with a non-volatile liquid of high specific heat to produce a mixture of low specific heat which can be heated without appreciable vaporization, the invention being thus distinguished from those set forth in Specifications 20,241/11, 29,590/12, and 1204/13. Mixtures of oil with trichlorethylene and hexachlorethane are described as suitable for the purpose of the invention.

24,918. Farley, J. Nov. 1. [Cognate Application, 5720/14.]

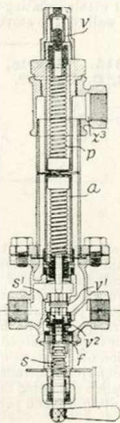


Heating buildings.—Relates to devices for accelerating the circulation in low-pressure hot-water heating-systems by mixing steam with the water in the flow pipe. In the course of the flow pipe is arranged a chamber *a* containing a bell *c* into which the lower portion *b'* of the flow pipe projects. The upper portion of the chamber *a* is of conical form, and from its vertex

proceeds the upper portion *b* of the flow pipe. From the top of the bell *c* a small pipe *c'*, which may contain a cock, passes into the chamber *a*. It is stated that steam accumulates in the bell *c* and passing through the pipe *c'* mingles with the water. Conical baffles *d*, *d'* are placed in the upper part of the chamber *a*. The bell *c* may be supported in place by lugs *e* to which are also attached the supports *e* of the baffles *d*, *d'*. The return pipes *f* may lead into the chamber *a* and the expansion pipe be connected to a return pipe *f* near the chamber *a*.

26,086. Samson-Apparatebau Ges.
 Nov. 13, 1912, [Concession date].

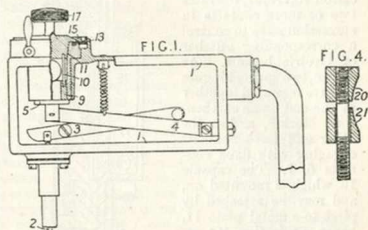
Thermostats.—A mixing-device for media of different temperatures comprises two admission valves *v*¹, *v*² for cold and hot fluid, respectively; the valve *v*² is connected to a hand-operated screwed spindle *s*, and serves as the abutment of a spring *f*, which tends to hold the second valve *v*¹ to an upper seating *s*¹. When the valve *v*² is opened to allow hot fluid to pass, the valve *v*¹ is free to be opened by the action of the thermal expansion device *a*, *p* to admit cold fluid to mix with the hot fluid or its passage to the outlet *s*², in proportions varying with the temperature of the mixture. The expansion device is of the known elastic chamber or hose type and is arranged with screw regulating means.



26,583. Hall, I. Nov. 19. [Cognate Application, 5198/14.]

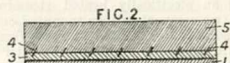
Thermostats.—In apparatus similar to that described in Specifications 21,072/12, 28,346/13, and 6016/14, having a gas-valve 5, Fig. 1, operated by the differential expansion of a rod 2 and tube acting through levers 3, 4, the valve seat 9 is screw-threaded externally, and is adjusted by means of a head 17 having pins 10 which cause axial movement of the seat, the head being prevented from moving axially. The head or the seating-support 11 is provided with a pin 13 engaging with a slot in the other part, a

stop, not shown, being fitted in the slot. A removable ring 15 allows the head to be lifted so as to disengage the pin and stop, and permit of adjustment through more than one revolution



of the head. A locking-device may be provided consisting of a screw and two blocks 20, 21, Fig. 4, which engage with the conical part of the head. According to the Provisional Specification 5198/14, the head may be graduated or provided with a pointer to read against a fixed scale. According to the Provisional Specification 26,583/13, the head may be provided with a spring detent, and with a non-circular stem engaging in a boss on the seat.

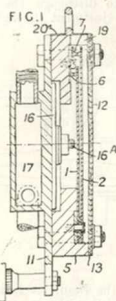
26,729. Wailles, Dove, & Co., and Macdonald, C. Nov. 20.



Non-conducting coverings for heat.—A cementitious or bituminous material 5 is fastened to a metallic or other foundation 1 by securing to the foundation a layer of bituminous enamel 3 and partially embedding therein, preferably white hot, reinforcing-metal 4 such as expanded metal, wire netting, bars, &c. Finally, the covering-material 5 is moulded upon the projecting metal. The enamel 3 is prepared by mixing bitumen, asphalt, or pitch with barytes, marble dust, lime, cement, and sulphur, and is preferably secured to the foundation by means of an adhesive bituminous solution composed of bitumen, pitch, resin, and wax and a solvent such as ethylene, turpentine, or naphtha. The invention is applicable to the covering of decks, the walls and floors of cabins and saloons, machinery spaces in ships, and to bridges, roofs, tanks, partitions, &c.

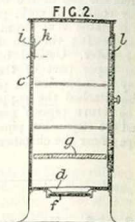
26,831. Hearson, C. E. Nov. 21.

Thermostats.—A capsule, preferably of the kind described in Specification 13,178/91, operates two or more contacts in succession so as to control a corresponding number of electric heaters. As shown, two spring tongues 1, 2 are mounted together at one end on an earthenware block 5, and at the other end have contacts engaging with fixed contacts 6, 7. The capsule 16, which is mounted on, and may be attached by pitch to a metal plate 11, has a projection 16^a engaging with the tongue 1, which, as the temperature rises, is moved against the tongue 2. An opening 19 closed by a cover 20 is provided for inspection purposes. A metal cover-plate 12 with a layer of asbestos paper 13 is mounted on the block 5. The plate 11 forms part of a conduit 17 for steam used in cooking and sterilizing apparatus as described in Specification 26,835/13. One of the heaters may be permanently in circuit, and one circuit may be opened when the water boils, the production of steam being controlled by another heater.

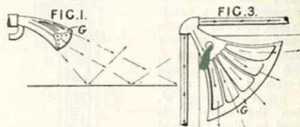


26,907. Timm, E. Nov. 22.

Heat storing apparatus; stoves.—A stove heated by gas, spirit, &c. or by coal is provided with a plate *g* or other body which stores up heat, so that the heat supply can be cut off and the process for which the stove is used, such as cooking or enamelling, completed with the aid of the stored-up heat. The heat is admitted through an opening *d* which can be closed by a slide *f*. The walls of the stove are provided with an insulating lining *c*, and the door *l* engages with the whole thickness of the wall and lining. Openings *i* provided with regulating-shutters *k* are formed in the back wall of the stove.



27,314. Morris, [known as Williamson, M.], M. C. Nov. 29.



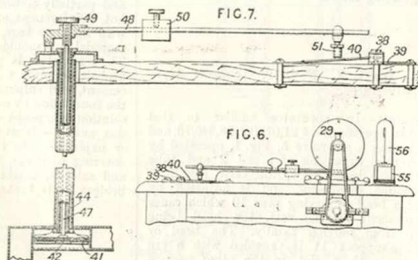
Radiators.—Relates to devices for directing radiant heat or currents of heated air downwards towards the floors of rooms. In the arrangement shown, a fan-shaped and downwardly-directed casing *G* with a perforated front contains hot-water pipes, electric heaters, or other heating means. A current of air may be caused to pass through it by convection or by means of a fan. Other forms which are described include a hot-water pipe arranged beneath a moulding or in a hollow in the wall with a slanting top and perforated front.

26,835. Hearson, C. E. Nov. 21. *Drawings to Specification.*

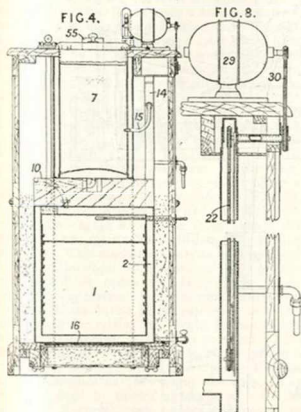
Thermostats, capsule. A thermal switch for regulating an electrically-heated steaming oven comprises two compact springs mounted one above the other so as to be operated in succession as the temperature rises by a capsule on the outer wall of a metal box in communication with the steam space. Of the two heaters thus controlled, one is used only for heating up the water; a third heater is permanently in circuit.

27,370. Hearson, C. E. Nov. 27.

Thermostats.—An incubating chamber 1, Fig. 4, is surrounded by a water-jacket 2 and has above it a refrigerating chamber 7 adapted to contain ice and having a perforated false bottom and a pipe 10 leading to the water-jacket, an electric heater 16 being placed underneath the incubating chamber. Water is circulated as required between the water-jacket and refrigerator by means of an endless wire coil 22, Fig. 8, passing over



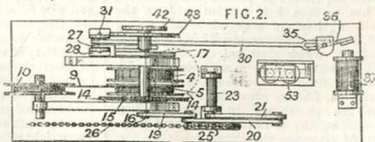
pulleys and driven by an electric motor 29 through gearing 30. The lower end of the wire coil communicates with the top of the water-jacket and the upper end of the wire coil throws off the water



into a chamber 14 connected by a pipe 15 with the refrigerating-chamber. The thermostatic controlling means comprise two fixed electrical contacts 38, 39, Figs. 6 and 7, and a movable contact 40, the free end of which is arranged between the two contacts 38, 39, and is adapted to coast with either of them, but when free bears against the upper contact 38. The contact 39 is electrically connected with one terminal of the electric heater and the contact 38 is connected with the electric motor 29. The movable contact is common to the motor circuit and to the heater circuit. A capsule 41, Fig. 7, of the kind described in the above mentioned Specification is held in a stirrup 42 in a tube 44. A rod 47, rests in a cup on the top of the capsule and the rod contacts with an adjustable screw 49 in a pivoted lever 48 carrying an adjustable weight 50 and having a fibre stud 51 adapted to bear on the movable contact 40. A fuse 55 and an incandescent lamp 56 are arranged in the circuits.

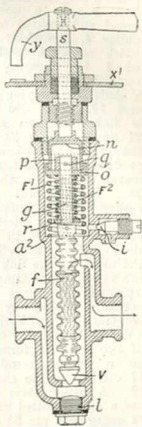
27,676. Wiesner, F., and Wiesner, J. Dec. 1.

Thermostats.—Dampers for furnaces of water heaters are controlled by a contact-thermometer, electro-magnet, and mechanical relay. The air-supply and flue dampers are operated by a chain 26 which passes round a chain-wheel 25. As



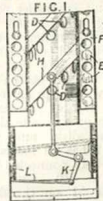
27,449. Arndt, M. Nov. 28, 1912, [Concession date]. Void. [Published under Section 91 of the Act.]

Thermostats; steam-traps.—A thermostatic valve for controlling the inlet or outlet of a heating-medium to or from a radiator has a spring between an expanding tube and a regulating-stem to prevent over-actuation, and to allow of setting at a lower temperature after the valve has already been closed at a higher temperature. As shown, the valve V is mounted on a corrugated tube f containing oil, the tube having at the upper end a stem g with a pin q and collar p movable inside a cup n. A spring F² is secured between a disk r on the stem and a disk o loosely mounted on the stem and held against the cup n by a spring F¹, which rests on a ledge a² in the casing. An adjustable stem S, with a pointer y moving over a scale X¹, bears against the cup n. This arrangement allows the stem g to move into the cup n against the action of the spring F². A drain plug l and a relief valve i are provided.



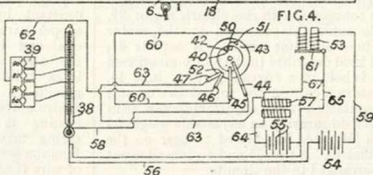
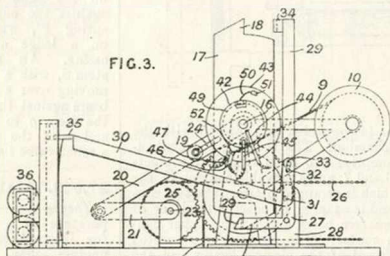
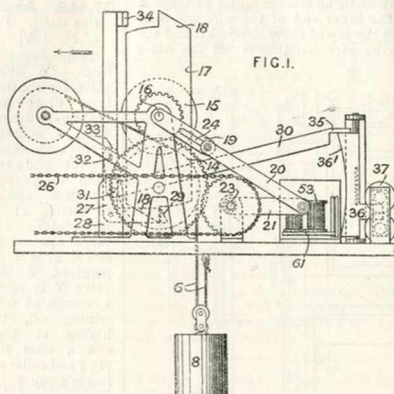
27,522. Halliday, T. E. Nov. 29.

Thermostats.—The temperature of a vaporizer for internal-combustion engines may be kept constant by a coil of copper wire L, of which one end is fixed and the other end attached to a bell-crank K, for moving a slide which controls the flow of the heating medium. A spring may act in conjunction with the coil of wire if necessary.



shown, the damper operating means, which is normally locked, comprises a weight 8 hanging from a rope 6 wound round and secured to a pulley 4, the shaft of which carries a toothed wheel 14 engaging a toothed wheel 15 on a shaft 16 carrying an arm 19. The arm 19 is linked to an arm 21 on the shaft 23 of the chain-wheel 25, and produces an oscillating motion of the chain-wheel 25. The amount of closing of the dampers may be varied by altering the effective length of the arm 19 by adjusting the pivot for the link 20 in a slot 24. The damper operating means is normally locked by a bell-crank lever 27 having a detent 29 engaging one of two teeth 18 formed on a ratchet member 17 carried by the shaft 16. A tilting lever 30 has a short slotted arm 32 engaging a pin 33 on the locking lever 27, and the longer arm has a forked end 35 resting on the top of a plate 36' forming part of a rocking armature 36 for an electro-magnet 37. The shaft 16 also carries a circuit controller comprising a disk 43 of insulating material and an electrically conducting disk 42. The disk 43 has a contact button 52 with which spring contacts 46, 47 normally engage on opposite sides of the disk, and the disk 42 has an insulated contact 49 connected by a wire 50 with a contact 51 on the disk 43. Spring contacts 44, 45 engage the disk 42.

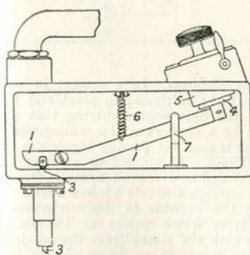
The contacts 49, 51 are so placed that when the shaft 16 has made a half revolution from the position shown they are engaged by the spring contacts 46, 45. The thermometer 38 has platinum wires to any of which electrical connexion may be made by means of a plug in a slotted plate 39. A second electro-magnet 53, with an armature 61, and batteries 54, 55 are provided, and electrical connexions are as shown in Fig. 4. When the water temperature is normal, a current from the battery 54 traverses the circuit made by the



wires 56, 58, contacts 44, 45, wire 60, magnet 53, and wire 59 and attracts the armature 61. When the temperature rises so as to make electrical connexion through the thermometer, a current from the battery 55 traverses the circuit made by the wires 56, thermometer 38, wire 62, contacts 46, 47, wire 63, magnet 37, and wire 64, and the armature 36 is attracted to the magnet 37. The tilting lever 30 is then released and falling under its own weight operates the locking lever 27 and releases the disk 17. The weight 8 then operates through the mechanism

to turn the chain-wheel 25 and so close the dampers and also rotates the ratchet member 17. In its rotation, the upper tooth 18 of the ratchet member 17 temporarily engages a projection 34 on the locking lever 27 so as to restore the levers 30, 27 to the position shown, the lever 27 again locking the member 17 after it has made a half revolution. The disks 42, 43 also rotate, braking the second of the above circuits, and allowing a spring to restore the armature 36 to its normal position and again support the lever 30. When the apparatus comes to rest, the first of the above circuits is broken and a current from the battery 54 through the circuit made by the wire 56, thermometer 38, wire 62, contact 46, wire 50, contact 45, wire 60, magnet 53, and wire 59 energizes the magnet 53 so that it still attracts the armature 61. When, owing to a fall of temperature, this circuit is broken at the thermometer, the armature 61 drops and completes a circuit from the battery 55 through the wire 64, magnet 37, wire 67, armature 61 and wire 65, which energizes the magnet 37 causing it to attract the armature 36 and again release the damper-operating mechanism. This mechanism acts as before except that the chain-wheel 25 rotates in the opposite direction and so opens the damper, the whole apparatus being restored to the normal state shown after the half revolution of the ratchet member 17. Winding gear for raising the weight 8 when it has reached the bottom of its travel is provided. This comprises a pulley 5 on the shaft of the pulley 4 on to which a rope 9 winds, and a pulley 10 from which it unwinds as the weight descends. The weight is raised by rewinding the rope 9 on the pulley 10. A spring may replace the weight to operate the dampers.

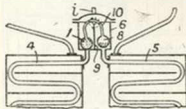
28,346. Hall, I. Dec. 9.



Thermostats.—A differential expansion device consisting of a carbon or other non-metallic rod 3 and a metal tube, operates a lever 1 which is bent as shown and carries a valve 4 co-operating with an inclined seat 5 mounted in a casing. A spring 6 tends to close the valve, and the lever is guided by a fork 7. A temperature-indicator may be operated by the lever. The apparatus may be used

with furnaces for re-melting used type. Specifications 21,072/12 and 26,583/13 are referred to.

28,537. Söderlund, O., Böberg, T., and Techno-Chemical Laboratories, Ltd.
Dec. 10.

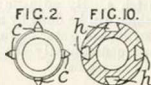


Thermostats.—A thermostat 6 for controlling the supply of feed-water through a pipe *i* from two separate heating-coils 4, 5, consists of a floating device comprising two bulbs 7, 8 containing a liquid such as ethylene chloride; the bulbs are disposed on either side of a partition 9 and are connected by a bent tube 10. If the temperatures of the two portions of feed-water differ, distillation of the ethylene chloride occurs, and the device tilts and obstructs the flow of the cooler portion of the feed.

28,744. Rowe, T. Dec. 12.

Hot-water bottles.—

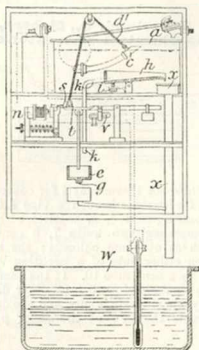
Sockets for stoppers for india-rubber hot-water bottles, water beds, &c. are formed with projections or depressions which present faces or edges to the rubber when the neck of the bottle is formed round the socket and prevent the socket from twisting in the bottle neck when the stopper is screwed in tightly. Fig. 2 shows a plan of such a socket with projections formed as pointed arms *c* and Fig. 10 a section of a socket with undercut recesses *h*. Several other forms of projections and recesses are described.



28,797. Anger, R. Dec. 13.

Thermostats.—The temperature in a vessel in which water is heated is regulated by adding a quantity of cold water, the amount of which can be controlled when the temperature of the heated water reaches a certain point. The water is supplied from a tank *a* provided with a ball cock by means of a flexible nozzle *c* which is normally held above the level of the water in the tank *a* by a cord *d* attached to a weighted lever *t*. The lever *t* is held down by a catch *s* which is released by an electro-magnet *n* when the circuit of the magnet is closed by means of a thermometer in the water-heating vessel *w*. The nozzle *c* then falls, delivering water to a tank *h* which delivers it to the

vessel v through a pipe x . At the same time, the circuit of the electro-magnet is broken by a tilting tube v containing mercury and attached to the lever t . From the tank h a drain-pipe k leads to a



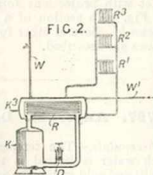
vessel attached to the cord d^1 provided with a small outlet g . When the vessel is full, its weight raises the nozzle e and the lever t re-engages with the catch x . By adjusting the inclination of tank h , which can be done by means of a screw i , the proportions of water flowing to the pipe x and vessel e , and consequently the amount of water delivered can be regulated.

28,912. Jahn, K. Dec. 15.

Heating by circulation of fluids.

—In systems of heating by hot water, the boilers or other elements where the water receives heat are made approximately equal in total volume to the radiators or other elements where the heat is given off.

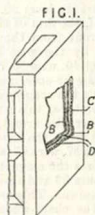
The invention is applicable both to systems in which the hot water is used directly for heating buildings &c., and to systems in which the water is used to heat other water. In the arrangement shown, a boiler K is connected to a tubular or like heater R in a tank K^2 . The volume of the heater R is equal to that of the boiler K . The tank K^3 is connected to a system of radiators R^1, R^2, R^3 and the volume of the tank K^3 is equal to the sum of



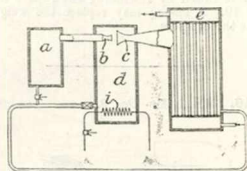
those of the radiators R^1, R^2, R^3 . The tank K^2 is provided with a cold-water supply-pipe W^1 and a hot-water delivery pipe W . A regulating device D consisting of a cylinder and piston is provided, by means of which irregularities of volume due to fitting &c. can be compensated for.

28,983. Piazza, C.
Dec. 16.

Non-conducting coverings for heat.—A refrigerator is formed with double walls B, B^1 , the space between which is packed with granular charcoal D , with an intermediate sheet C of cardboard coated on the inner side with a mixture of tar and nitre.



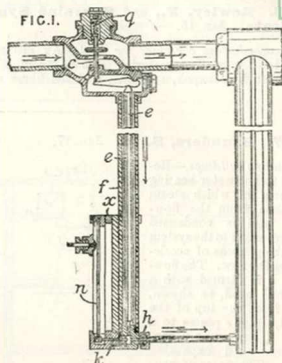
29,830. Altenkirch, E., and Tenckhoff, B. Dec. 27, 1912, [Convention date].



Heating buildings.—In a system in which the waste heat of a refrigerating plant and the waste heat of the heat engine driving that plant are received by a condenser, the cooling-water of the condenser is used for passing through radiators to heat buildings. As applied to a system in which water is cooled by evaporation, steam from a boiler a passes through a nozzle b into a nozzle c thereby reducing the pressure in the refrigerator d , the vapour from which passes to the condenser e together with the steam from the nozzle b . The circulating water from the condenser is passed through radiators and the condensate is returned to the boiler and the refrigerator which may be heated by a spiral i through which well or waste water is circulated.

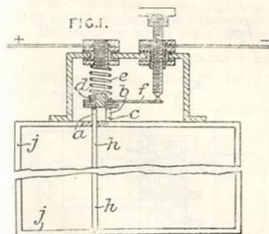
29,964. **Clorius, A. V., and Clorius, O. T.** Jan. 2, [Convention date].

Thermostats; radiators.—A thermal valve regulating the supply of steam or hot water to a radiator is controlled by a thermostatic pilot valve. In the arrangement shown, the valve *c* is opened against the action of a spring *q* by the expansion of a metal rod *e* placed in a tube through which steam may pass to the radiator or to an outlet through a small tube *h* having a pilot valve *k*, operated by an adjustable bimetallic strip *n*. When the temperature is excessive the valve *k* is closed, and steam condenses in the tube *f*, the subsequent contraction of the rod *e* allowing the valve *c* to be closed. A wooden shield *x* is interposed between the bimetallic strip and the tube *f*. In a modification for use with a hot-water radiator, the pilot valve is placed in a casing at some distance from the radiator, and is connected by pipes with the main valve casing. In this case, a metal or porcelain rod is used having a smaller coefficient of expansion than the tube.



A.D. 1914.

828. **Heraeus Ges., W. C.** Jan. 29, 1913, [Convention date].

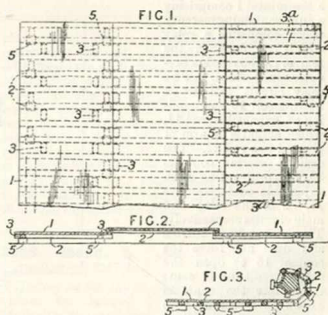


Thermostats.—A contact-arm *f* is mounted on an insulated button *d* held in engagement with three points *a*, *b*, *c* on the expansion members *h*, *j* by a conducting-spring *e*. The points are arranged in the form of a triangle and fit in recesses in the button; an edge may be used in place of the points *b*, *c*. The button may be of metal or of insulating-material. The point *a* forms the end of a non-expanding nickel-steel rod *h*, and the points *b*, *c* are mounted on an expansion member *j* of nickel, iron, or aluminium.

1061. **Tischler, V.** Jan. 14, 1913, [Convention date].

Non-conducting coverings for heat.—A cover for

protecting exposed ice surfaces comprises heat-proof cloth 1 attached to transverse slats 2 spaced by distance-pieces 3 or by small boards 3'. The slats are fitted with blocks 5 to raise the cover



above the ice so as to form an insulating layer of air, and the cover may be arranged in overlapping sections, as shown in Fig. 2, the blocks 5 being dispensed with for the upper layers, or the cover may be arranged on a roller, as shown in Fig. 3.

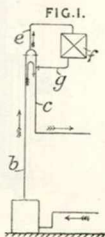
1133. Rowley, F., and Sanrainé Syndicate. Jan. 15.

Non-conducting coverings for heat.—An electric and heat insulating material is made from silk cotton such as kapok, roa fibre, and the fibres of

bombax malabaricum and callotropis gigantea. The silk cotton is compressed and may be mixed with other materials or mounted upon a strengthening-base, such as a slab of slate. For heat insulation the material is placed between the double walls of a vessel.

1307. Saunders, S. M. Jan. 17.

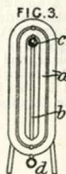
Heating buildings.—Relates to hot-water heating systems in which steam is taken from the flow-pipe and is condensed and returned to the system for the purpose of accelerating the flow. The flow-pipe *b* is formed with a vertical bend, as shown, and from the top of the bend, a pipe *e* passes to a tank *f*, serving as a condenser and expansion tank. The water of condensation is directed to the downward branch *c* of the flow-pipe by the pipe *g*. Modifications are described in which the condenser and expansion tank are separate. A damper, operated by the difference of pressure between the



top of the flow-pipe and the boiler, may be provided.

1364. Schröder, K. Jan. 18, 1913, [Convention date].

Radiators.—Steam-heated radiators are formed of O-shaped units, the two ends of each unit being connected by a pipe to which are attached the inlet and condensation pipes. In the form shown in Fig. 3, the element consists of two O-shaped pipes *a* connected by a pipe *b*, to which are attached the inlet pipe *c* and condensation pipe *d*. Radiating-plates may be attached to the elements.



1779. Fairbrother, H., [Thermo Electric Instrument Co.], Jan. 22.

Thermostats.—The circuit of an electric heating-device 41 is controlled by a thermostat 1 comprising a tube containing mercury which completes a relay circuit at 6 when the temperature exceeds a predetermined limit. The relay circuit includes a heating-coil 10 surrounding an expansible rod 11, which actuates an arm 21 pivoted to a rod 22. The arm 21 carries contacts 30, 31 co-operating with adjustable contact-screws 15, 32 in the relay and main circuits respectively. The contact 30 is flexible and does not leave the contact 15 to open the relay circuit until some time after the contacts 31, 32 have separated to open the main circuit, a condenser 45 being provided to prevent sparking at the contacts 31, 32. An additional hand-controlled switch 52 and indicating-lamp 50^a are provided to assist in adjusting the needle 6 of the thermostat 1.

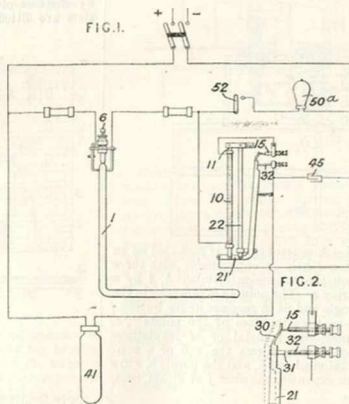
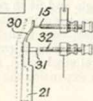


FIG. 2.



1886. **Whitmarsh, R. B.** Jan. 23, 1913, [Convention date].

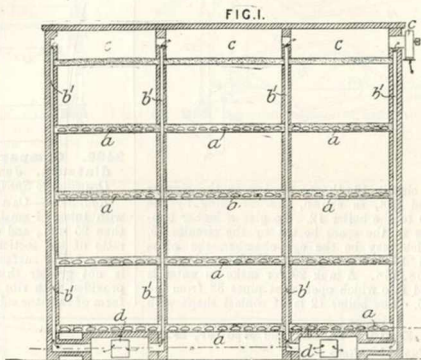
Hot-water bags specially intended for application to the face are made as shown in the form of the frustum of a cone with an opening at the apex through which the user can breathe.



2009. **Wilson, J.** July 27.

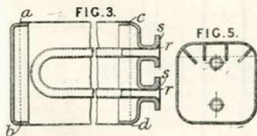
Heating buildings.—

Buildings, such as hospitals, asylums, and schools, are heated by air without permitting it to enter the apartment, by passing the air through conduits in the walls or floors as described in Specification 15,231/95. The invention consists in the particular disposition of the conduits in the walls or floors, as distinct from ducts or pipes let into the walls at intervals. The disposition is shown in Fig. 1, which is a sectional elevation of a building divided into compartments. Horizontal conduits *a* open into vertical flues *b'*. A fan *c* is provided in connexion with the trunk flue *c*, while hot-air distributing chambers are built in the lower part of the building, connected by suitable ducts *d* with a furnace or other heater. Hot-water or steam pipes may be em-



ployed at intervals to maintain the temperature in the conduits or flues.

2072. **Maurice, L.** Jan. 28, 1913, [Convention date].



Heat-storing apparatus.—Heat accumulators for use in combination with boilers are placed in boiler-furnace combustion-product conduits, which are provided with valves or baffles to control the heat absorbed by the accumulators and render it independent of that supplied by the furnaces. The accumulators serve as superheaters, auxiliary heaters, or as the sole heaters when the furnaces are extinguished. The superheating may be limited at starting by admitting a small fraction of the feed-water into the steam-chest. An accumulator may consist of vertical rows of sheet-metal cylinders, each containing a fusible mass and closed by a

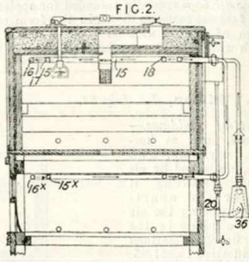
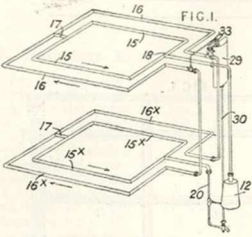
cover, which may be provided with ribs through which pass the ends of a tubular vaporizing-coil. The joints are made fluid-tight by a metallic layer obtained by acetylene; for example, in the form shown in Fig. 3, the zone *r-s* is autogenously welded, and the metallic layer extends along the junction lines *a-b*, *c-d* of the steel ends and sheet-metal body. Radial ribs may be welded in the cylinder as shown in Fig. 5. The vaporizing-coils in each vertical row are connected together, and end at the top in a steam chest or receiver and at the bottom in a feed-water collector. Specification 10,571/98 is referred to.

2366. **Bond, L.** June 4, 1913. [Cognate Application, 2367/14.]

Heating by circulation of fluids; radiators.—In a system for heating by hot water, especially applicable to combined incubators and chicken-rearing devices as described in Specification 12,873/13, [Class 5 (ii), Housing &c. animals], two circuits of heating-pipe 15, 16 are arranged one within the other and connected at the side furthest from the hot-water supply by a short pipe 17. A special form of boiler is

also described. The water from the boiler 12 is divided at 18 into two streams which flow along opposite sides of the circuit 15, reunite, are redivided and flow back along opposite sides

an internal heating space 36. The return pipe 20 opens into a cross pipe in the space 36.



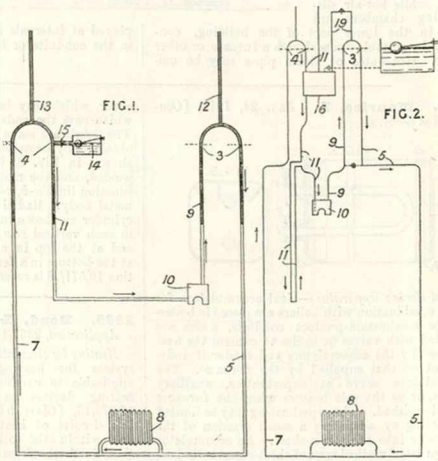
of the circuit 16, thence passing to the circuits 16x and 15x, as shown, and returning by the pipe 20 to the boiler 12. To give a higher temperature in the space heated by the circuits 15, 16, which may be the egg chamber, the pipes 15 and 16 are of greater diameter than the pipes 15x, 16x. A tank 29 for make-up water is provided into which open vent pipes 33 from the pipes 16. The boiler 12 is of conical shape with

2489. Compagnie Nationale des Radiateurs. June 5, 1913, [Convention date].
Drawings to Specification.

Radiators.—Cast radiator sections are made with tubes of small external diameter, not more than 25 mm., and of small thickness, so that the ratio of the sectional area of the metal to the area of the surface of one millimetre of tube is not greater than four. Such tubes may be provided with ribs and made up into any known form of radiator suitable for casting.

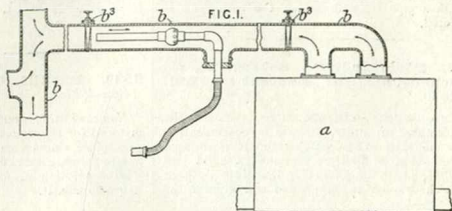
2681. Dodds, W. M., and Stoner, G. A. Feb. 2.

Heating buildings.—Relates to low-pressure hot-water-heating-systems for radiators. Fig. 1 shows in elevation the system applied to a radiator. The pipes are disposed, as shown, so as to form two U-shaped systems connected at their upper parts 3, 4; a supply tank 14 being arranged to communicate with the return pipe 11 near its upper part. The water from the boiler 10 circulates through the pipes 9, 5, to the radiator 8, and returns by the pipes 7, 11. Steam and air vents 12, 13 are fitted, as shown. A non-return valve 15 is arranged in the outlet from the tank 14. Fig. 2 shows the system applied to a water heating system for domestic supply. The storage tank 16 is connected to the pipe 11 and is in communication with the vent 19. Water can be drawn off at any point of the pipe 11.



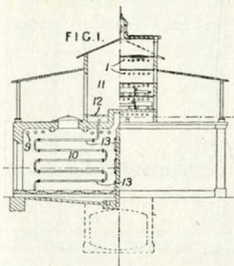
2708. Harnett, J., and Glasspool, R. L. March 14.

Heating buildings.—Relates to systems for heating by water circulation in which steam is injected into the pipes to facilitate the flow of the water. Hot water from the boiler *a* circulates through pipes *b* disposed for heating one or more glass-houses &c., and steam from a separate boiler is introduced through injectors, as shown, which are disposed between stop valves *b*³, so that in the event of a fracture in the pipes, the escape of steam and water can be prevented. Excess of water result-



ing from the condensation of steam returns to a feed-water tank and escapes by an overflow pipe.

2998. Beccari, G. Feb. 5. [Addition to 7946/12, Class 111, Sewage.]

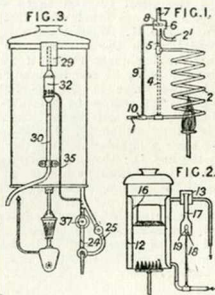


Heating by chemical action.—The heat of a fermenting mass of stable manure in chambers 10 may be used to heat pipes 13 leading to buildings, fowl-houses, drying-apparatus, &c., or, by direct contact, to heat boilers, saucapans, &c.

3300. Junkers, H. Feb. 13, 1913, [Convention date].

Thermostats.—In order to control the water supply of a geyser, the discharge pipe of which has an enlarged portion through which the water passes, a thermostatic device is placed in this enlarged portion above the water level or in a separate steam chamber connected therewith. Fig. 1 shows an apparatus comprising a heated

coil 2 fed by a pipe 1; a return pipe 4 ensures circulation, a non-return valve to prevent upward circulation being sometimes arranged in this pipe. Steam flows out through a chamber 6 forming an



enlarged part of the outlet pipe 7. Water flows off through a pipe 2¹ connected to the bottom of chamber 6 or to the pipe 5. The steam in the chamber 6 acts on a heat-sensitive capsule 8 connected by an hydraulic column to a valve 10 in the feed pipe. In the apparatus shown in Fig. 2, the heat-sensitive capsule 19 through which the feed is controlled is located in a chamber 17 connected by a pipe 17 with the upper, steam-filled, part of an enlargement 13 in the outflow pipe. In the apparatus shown in Fig. 3, a by-pass pipe 25 is connected in parallel with the main pipe 24, and a valve 37 in this main pipe is controlled from the heat-sensitive capsule through a pipe 35. This capsule is wound round a flow-restricting cone contained in a perforated casing 32 connected to the

steam space of an enlargement 29 into which the outflowing hot water pours. The water is drawn off through a pipe 30 with which the casing 32 is connected.

3456. Söderland, O., Boberg, T., and Techno-Chemical Laboratories, Ltd.
Feb. 10.

Heating-systems.—In operations, such as the manufacture of sugar, in which concentration forms one step and in which evaporators are used such as described in Specifications 12,462/11 and 22,670/11, [both in *Class 32, Distilling &c.*], in which the vapour is compressed and utilized, the

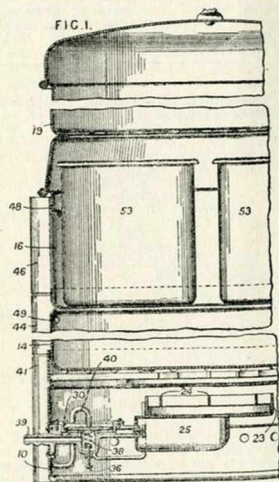
compressors are driven by steam turbines, preferably coupled directly thereto, the exhaust steam from which is used for other steps of the process, such as heating.

3533. Burkill, C. Feb. 11. *Drawings to Specification.*

Non-conducting coverings for heat.—An insulating material for the walls of refrigerators consists of a gelatinized starch composition prepared by mixing potato starch, cassava flour or like starchy substance with a solution of magnesium chloride or other hygroscopic salt.

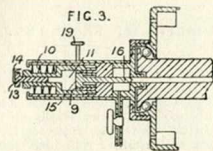
3644. Liddle, J., [Harter Co.]. Feb. 12.

Thermostats.—An automatically controlled gas cooking-apparatus comprises superposed cooking-vessels 14, 16, 19, and a heating section 10 fitted with a burner 23 controlled by a diaphragm 30 operated by a thermostat in a flue 41 at the side of the section 10. The vessels 14, 16 contain water, the vessels 53 food to be cooked, and the vessel 19 food to be steamed. The vessels 14, 16 are fitted with flues 44, 46 which join the flue 41. When the gas is turned on, it passes through the connexion 39 to the underside of the diaphragm 30, lifts it, and passes to the mixing-chamber 25 and the head 24 of the burner. As the water in the vessels 14, 16 boils, the steam &c. escapes by apertures 48, 49 into the flues 46, 44, 41, and thence by an aperture 50 into the burner section 10. The steam &c. in its passage heats a liquid-containing thermostatic capsule in the flue 41; the increased pressure in the capsule is transmitted by a pipe 40 to the upper side of the diaphragm 30, thus diminishing the gas supply to the burner. If the vessels 14, 16 are removed, a current of cooler air passes down the flue 41, and a temporary increase in the gas supply and heating effect is obtained. The effect of the thermostat may be varied by means of the spring 38 and screw 36.



3730. Hailer, H., and Hofmann, H.
Feb. 1.

Thermostats.—The admission of a cooling-fluid to a rotary cooling apparatus is controlled by the expansion of mercury in a part 11, Fig. 3, movable against the resistance of a spring 10 to open the valve 16, to the end 15 of which it is connected. The part 11 is guided over fixed pins 9, and carries a screwed stud 13 with a pointer 14 for adjustment of the temperature at which the valve should open. The part 11 may be held in the open position by a locking-member 19. When used for controlling

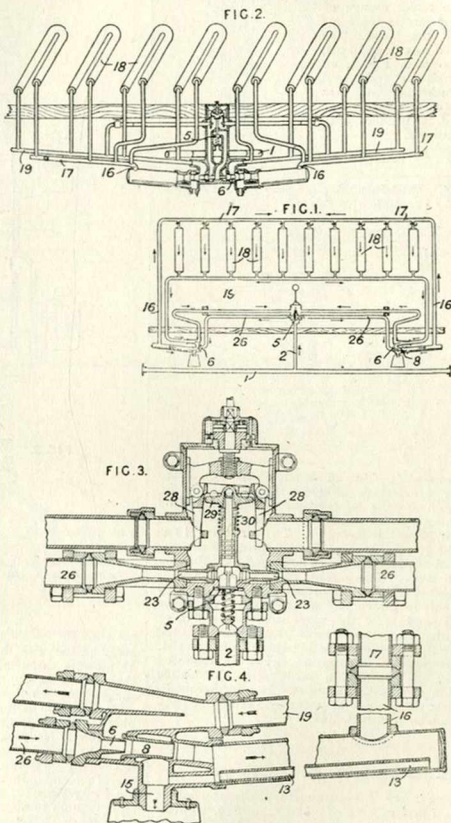


the admission of a heating medium to a heating apparatus, the part 11 is fixed and the end 15 of

the valve is movable therein under the action of a spring tending to open the valve.

3803. **Pintsch Akt.-Ges., J.** Oct. 25, 1913, [Convention date]. [Addition to 18,826/13.]

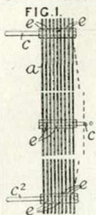
Heating vehicles; thermostats.—Relates to improvements in the means described in the parent Specification for heating railway carriages by means of steam and consists in subjecting the steam-regulating device to the action of steam free of condensation water by leading branch pipes from the return flow pipe before the latter enters the water-separators, and in fitting to one steam-regulating device (steam-inlet arrangement) two or more circuits and as many water-separating devices which mutually assist one another in their functions. Fig. 1 shows diagrammatically an installation for corridor coaches, Fig. 2 an installation for separate coaches, Fig. 3 the steam-regulating device with accessories, and Fig. 4 a water-separating device. The course of the steam through the system is indicated by arrows. The main steam-pipe with branches, heating-members, and return pipes are shown at 1, 2, 18, and 19 respectively. The spring-pressed steam-valve 5 is controlled in its opening by the expansion of the branches from the steam return pipes, operating upon the L-levers 28 and the cap 29 of the valve spindle 30. Steam admitted on opening the valve 5 passes to the supply-pipes 26 by the nozzles 23, and to a series of nozzles 6, 8, which, as described in the parent Specification, induce steam in the branches 16, but at the same time allow condensed steam to pass away through the separators 13 and drip-pipes 15. The lever mechanism of the steam inlet valve is adjustable by a suitable regulating screw. When two or more circuits are employed, both the steam feed-



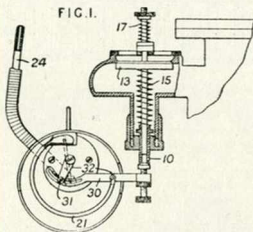
pipes 17 and the outlet pipes 19 are connected together at their ends so as to form, as shown in Fig. 1, a closed network of pipes.

3998. **Malone, J. F. J.** Feb. 16.

Thermostats.—A number of bimetallic strips is mounted at the ends so that the direction of curvature under change of temperature is the same in all the strips. The strips *a* may be mounted, as shown in Fig. 1, on two rods *c*, *c*² and spaced by washers *e*, a rod *c*¹ at the centre being connected, for instance, with a ventilator.



4140. **Haddan, R.**, [Stewart Warner Speedometer Corporation]. Feb. 17.

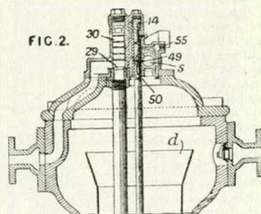
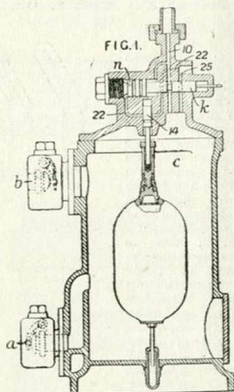


Thermostats.—The admission of air to a carburettor is controlled, through a thermostatic device, according to the temperature of the combustion chamber, by varying the resistance of the spring which loads the air valve. The air valve 13 is loaded by springs 15, 17, the spring 15 bearing against a sleeve 10 which is actuated by the thermostatic device. This consists of a Bourdon tube 21, one end of which is connected through a tube 24 to a bulb in the cooling water jacket. Variations in temperature of the water cause the end 32 of the tube 21 to move a lever 30 which actuates the sleeve 10. The lever has an adjustable fulcrum 31. An increase in temperature causes an increased supply of air. In a modification, a flexible diaphragm actuates the lever. In a further modification, the lever is actuated by a bimetallic strip through an adjustable link.

4351. **Brooke, R. G.** Dec. 30, 1912.

Steam-traps.—In apparatus for discharging liquids from a system working under a vacuum, a differential piston is used, which, in one position connects a receiver with the system so as to equalize the pressure, and in the other position closes this connexion, and admits steam or other fluid to discharge the liquid. In the trap shown

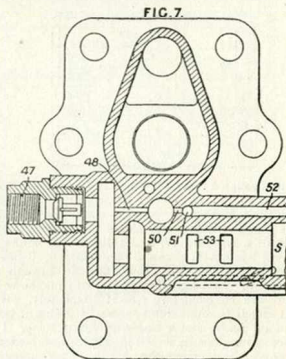
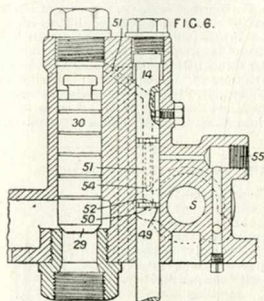
in Fig. 1 for use with an oil-separator, a float in a receiver *c* having inlet and outlet valves *a*, *b*, rises by accumulation of liquid and opens a valve 14 to connect one end *n* of the differ-



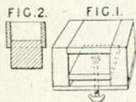
ential piston with the atmosphere or other source of pressure through a passage 22, so as to close the connexion 10 between the receiver and the system being drained, and establish at 25 communication between the receiver and the atmosphere to discharge the trap. When the float falls, the valve 14 is closed, and air leaks past the piston to the vacuum passage 10, and the piston is moved to the position shown by the atmosphere acting on the other end. In the trap shown in Fig. 2 for use in systems in which the pressure may vary from vacuum to above atmosphere, the valve 14 is operated by a bucket *d*. When the receiver is empty, steam admitted at 47, Fig. 7, passes along a passage 48, a groove 49, Fig. 6, in the valve 14, and a passage 51, to the back of the piston 30, to close the discharge valve 29, and by another passage 52,

Fig. 7, to the back of a differential piston, not shown, in a chamber *s*, to close the steam inlet valve, and connect the receiver by means of a double port 53 with the system. When the bucket fills, the

valve 14 is drawn down, and a port 54 connects the passages 50, 52 with the exhaust outlet 55, so that the discharge valve 29 and the differential steam-valve are both opened to discharge the liquid.



4355. Allgemeine Elektricitäts - Ges.
 Feb. 19, 1913, [Convention date].

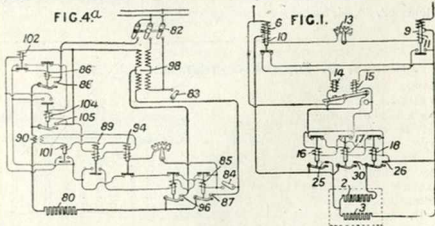


Heat-storing apparatus of the kind which is so arranged that it can be folded up or otherwise disposed so as to present a small surface while being heated and then unfolded to present a large surface

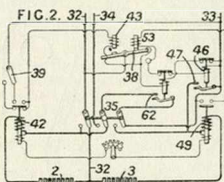
for giving off heat is so arranged that when giving off heat it includes spaces or cavities in which objects to be heated can be placed. Fig. 1 shows a simple form which the device may take, suitable for boilings or bakings. Two plates, preferably rectangular, are arranged in guides in such a manner that, during chargings or heatings, they may be closed towards each other, a heating body being introduced for example between them. Fig. 2 shows the device consisting of solid cylinders or bodies and hollow cylinders or bodies. In another form, a solid prismatic body is provided with a cap, while in a farther example, composed of four parts, the walls of the hollow body are hinged so as to lie flat during chargings or heatings, a cover-plate being also fitted.

4472. British Thomson-Houston Co., [General Electric Co.]. Feb. 20.

Thermostats.—The temperature of electric heating-apparatus such as furnaces is controlled automatically by the variation in resistance of one or more heaters connected in circuit with relays which vary either the connexions of the heaters, or the supply pressure. The apparatus is described for use with carbon or like heaters having a negative temperature-coefficient, but may be modified for use



with heaters having a positive coefficient. Four arrangements are described. In that shown in Fig. 1, two heaters 2, 3 are connected in parallel by means of a minimum relay 6, which closes the

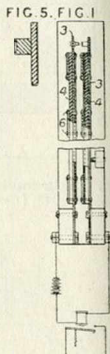


circuit through a relay 14, which in turn closes two switches 25, 26 by means of windings 16, 18. When the temperature rises, the maximum relay 9 opens these switches and closes the switch 30 by means of a winding 17, and relay 15, to connect the two heaters in series. The relays 6, 9 have opposing windings 10, 11 connected through a rheostat 13. In a second arrangement (not shown), heaters are connected in circuit alternately, with an intermediate connexion in series by means of two maximum relays and a single minimum relay. In a third arrangement, shown in Fig. 2, two heaters are connected in series either between high-pressure mains 32, 33 or low-pressure mains 32, 34. In order to heat up the furnace at starting, the switches 35, 39 are moved to the position shown, so as to connect the heater 3 alone across the high-pressure mains 32, 33, the switch 47 being closed by means of the windings 46, 43. As the temperature rises the maximum relay 49 closes the circuit of the winding 53, which moves the contact-arm 38 to the position shown so as to open the switch 47, and close a switch 62, to connect the heater 2 in circuit alone across the high-pressure mains. The switches 35, 39 are then moved by hand to the reverse positions, so as to connect both heaters in series between the high-pressure mains, through the switch 47. The consequent rise in temperature causes the maximum relay 49 to open the switch 47, and close the switch 62, thereby connecting the heaters between the low-pressure mains 32, 34. The minimum relay 42 then operates the switch 38 to reverse the switches 47, 62 and connect the heaters between the high-pressure mains. In the arrangement shown in Fig. 4, the heater 80 is connected at starting across the mains by closing the switches 82, 83, 84, thereby energizing windings

85, 86 to close switches 87, 88. As the temperature rises the overload relays 89, 94 are operated in turn by a transformer 90 so as to short-circuit the windings 85, open the switch 87, and close the switch 96, thereby connecting in circuit a part of the secondary of the transformer 98 to oppose the primary, and reduce the pressure. As the temperature and current increase, the overload relay 101 closes the circuit of a winding 102, which in turn opens the switch 88 and closes a switch 105 by means of a winding 104, thereby connecting the heater across half of the secondary winding of the transformer 98. A reduction of current causes the relays 101, 89, 94 to be de-energized, the switch 96 opened, and the switch 87 closed so as to connect the heater across the whole of the secondary.

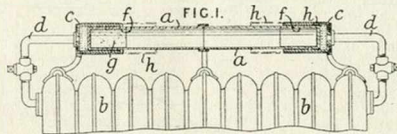
4618. James, G. A. Feb. 23.

Thermostats.—In a thermal switch in which two bimetallic bars are arranged to change their shape equally with a change of temperature, but with unequal rapidity, for controlling temperature or for use as a fire or temperature alarm, one of the contacts is made of curved shape as shown in Fig. 5. The less expansible strip of one bar is protected by a covering of fabric, the more expansible strip of the other bar being protected in the same way; or any of the strips may be coated with heat-insulating material, such as paint. The strips may be of brass 3, Fig. 1, and vulcanite 4, short strips 6 of brass being used for securing the rivets. In a modification, three bars are used, the two outer bars being enclosed in a casing, and the middle bar being exposed. In this case, two circuits are controlled. The switch may be used for controlling the temperature of incubators or buildings, or for detecting icebergs, or in steering, by the difference of temperature of the water near icebergs.

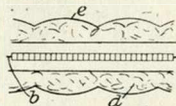


4653. Elborne, S. L., and Godsall, H. Feb. 23.

Radiators.—In a moistening-attachment for radiators, a body of porous material moistened by capillary attraction is used, being so arranged that the portion of the body exposed to the heating-medium is not exposed to the air. In one form, a hollow porous cylinder



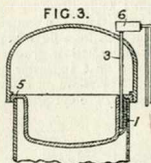
a closed at both ends is carried above a radiator *b* by sockets *c*, which communicate with the interior of the radiator by pipes *d*, so that the ends of the cylinder are exposed to the steam or water in the radiator. The inner surface of the cylinder is rendered impervious by a coating *f* of shellac. The cylinder may be strengthened by an internal filling *g* of plaster of paris. Sliding sleeves *h* regulate the amount of the surface of the cylinder *a* exposed. In modifications, the cylinder *a* is open at one end or is replaced by a porous plug terminating in a plate-lip portion forming the humidifying-surface.

5751. Gauvain, H. J. March 6.


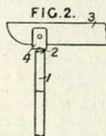
Bed-warmers.—Beds, mattresses, or overlays are heated by electric radiators, the arrangement being such that when the radiators are out of operation, fans may be employed for cooling purposes. The bedding *e* contains flexible metal tubing through which the wires *b* of radiators pass loosely. The wires are suitably insulated as by asbestos, clay, porcelain, glass or china beads. The filling *d* may consist of asbestos and the covering be such as to permit circulation of air through the bed. The current may flow in series or in parallel from suitable switchboards. When the mattress or overlay is perforated, a series of holes in connexion therewith may be provided with connecting-tubes extending partly or wholly through the mattress.

5889. Hall, I. March 9.

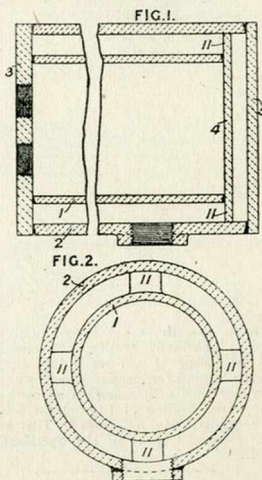
Thermostats.—The expansion member 3 of a thermostat 6 is located in a pocket 1 secured to the exterior of a crucible or melting-pot. Specifications 21,072/12, 15,323/13 and 21,158/13, [both in Class 51 (ii), Furnaces and kilns for applying &c.], 26,583/13, and 28,126/13, [Class 97 (iii), Thermometers &c.], are referred to.


6016. Hall, I. March 10.

Thermostats.—In apparatus for controlling or indicating temperature by means of a differential-expansion device as described in Specification 21,072/12, a steel or other metal ball 2 is interposed between the recessed end of a rod 1, forming one



of the differential members, and a lever 3 which operates a valve or indicator. A yoke 4, with a recess to receive the ball, is preferably mounted on the lever. Specifications 28,126/13 [Class 97 (iii), Thermometers &c.], 26,583/13, 28,346/13, [Class 51 (ii), Furnaces and kilns for applying &c.], are referred to.

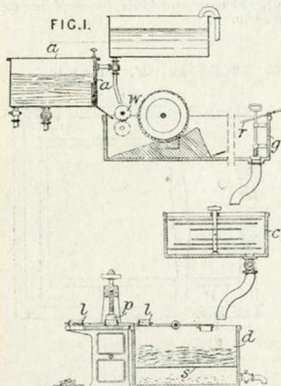
6090. McLaren, W. March 10.


Radiators for heating railway vehicles comprise an inner closed tube 1 containing acetate of soda or other suitable heat-absorbing material, and an outer tube 2 arranged to leave an annulus for the passage of steam. A disk or plate 3 is welded to the end faces of the tubes 1, 2, which at the other end are closed by welded plates 4, 5. The plate 4 is provided with cut-away portions for the passage of steam, leaving projections 11 which bear lightly against the inside of the tube 2 and allow the inner tube to expand freely. In a modification, the plate 3 is welded to the inner face of the outer tube and to the end face of the inner tube. Suitable supporting-feet may be formed integrally with the end plates.

6555. Oesterreichische Filzkorkwerke Ges. March 14, 1913, [Convention date].

Non-conducting coverings for heat and sound.—In a process in which fibres and heat-insulating material are obtained from the barks of osiers, one year old bark is steamed in a vessel *a* and then pickled in an alkaline soap bath. To separate the long fibres for spinning, the material is passed through

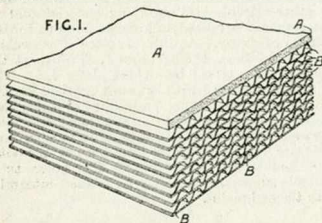
fluted rollers *u* to a hollander *g*, and the long fibres are lifted out by a rake *r*. Bark and short fibres pass to the mixer *c* from which they are discharged to a trough *d* having a sieve *s*. Finer



constituents pass through the sieve, and coarser material is lifted out by dipper frames *l*, and pressed by means of a press *p* into briquettes which may be used for insulating purposes.

According to the Specification as open to inspection under Section 91 (3) (a), the briquettes may be quilted into felt plates. This subject-matter does not appear in the Specification as accept-d.

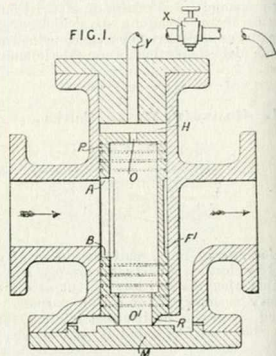
6573. Turner Bros., and Turner, H. R.
March 16.



Fire-proof coverings.—A fire-resisting block especially applicable to the bulkheads of ships consists, in one form, of a series of layers of corrugated sheets *B* of asbestos attached to flat sheets, and faced with a protecting-slab *A* of asbestos cement. The layers *B* may be of the form described in Specification 23,621/10 and may be formed of any suitable insulating-material such as magnesia or fossil-meal. The slab *A* may be

corrugated or may be reinforced with metal as described in Specification 14,662/13, [Class 87 (i), Bricks &c.].

6860. Fournier, J. B. March 19, 1913,
[Convention date].



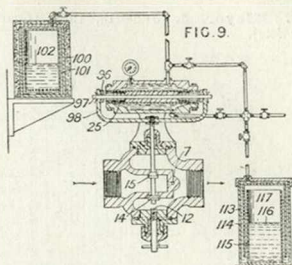
Thermostats.—A valve device applicable as a thermostat, and of the type in which a main valve is actuated by a piston acted on by fluid pressure under the control of a thermally actuated auxiliary valve, has the valve member formed integrally with a hollow piston through which the whole of the fluid passes. In the form shown in Fig. 1, the actuating piston *P* has an inlet port *A*, *B*, which is not throttled by the piston, an outlet port *O'* surrounded by a knife-edged valve member *R* adapted to engage a fixed seat *M*, and a leakage port *O* leading to the control chamber *H*. The outlet from the control chamber is controlled by a valve *X* on a flexible pipe *Y*. The piston is formed with a shallow groove *F'* communicating with the inlet port in order to balance the effect of the inlet pressure on the valve member. In a modification, the cylinder is jacketed.

6952. Brown, F. H. March 19.

Thermostats.—Relates to a thermostat of the fluid-pressure valvular type in which the sensitive thermal element 113-117, Fig. 9, and the loading-device 100-102 for the operating-diaphragm consist of enclosed cushions of elastic fluid. The cushion fluid 102, 117, such as air or gas, is preferably trapped in inverted containers 101, 114 surrounded by water, oil, &c. in closed outer vessels 100, 113 provided with communicating pipes and valves by



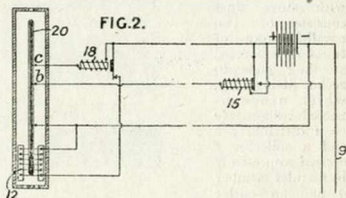
means of which any required standard pressure can be obtained in the cushion and the volume and pressure of the cushion varied. The valve-operating diaphragm consists of upper and lower members separated by a central spacing block and a series of concentric rings 25, the central block being connected to the valve by a diametral rod 97 and yoke 98. The weight of the diaphragm and attached parts is counterbalanced by an adjustable weight 46, Fig. 4, on a curved lever 43 (96 in Fig. 9), fulcrumed on pins 44. The range of movement of the concentric rings 25 is limited by the lateral pins 42, the ends of which are reduced in diameter in steps 35-38 so as to allow a greater movement to the rings nearer the centre. Adjustable stop-pins are arranged on the upper and lower sides of the counterbalance lever. The counterbalance device may be dispensed with. An adjustable screw stop 12 is used to limit the opening of the valve 14, 5 or to close the valve down. A by-pass 7 with a screw needle-valve is also provided. The diaphragm may be connected to the



valve through levers working on adjustable fulcra whereby the range of movement transmitted to the valve can be varied; this arrangement may be placed inside or outside the valve casing.

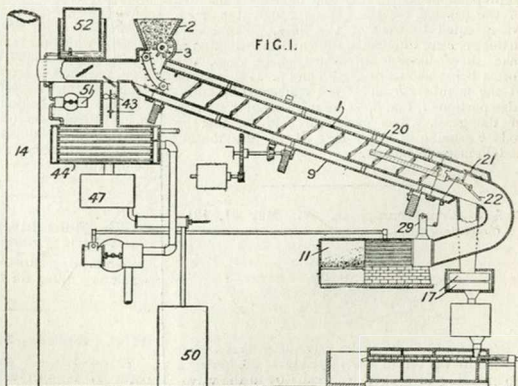
7462. Vertriebsges. Magnet Elektrischer Apparate. May 9, 1913, [Convention date].

Thermostats.—In an apparatus for indicating the rise of water, a thermometrical device is maintained at a temperature different from that of the water whereby, upon the contact with water, the temperature of the device is changed, which change is used to put an alarm in operation. A thermometer 20 in a casing is maintained at a constant temperature by an electric heater 12, which is cut out through the operation of the electro-magnet 18 when the mercury rises to a contact c. Upon water entering the casing, the mercury falls below a second contact b, thus breaking a circuit containing an electro-magnet 15, the armature of which then closes a circuit 9 containing the alarm.

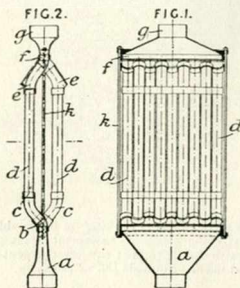


**7593. Ford, O. A.,
and Long, J. C.**
March 25.

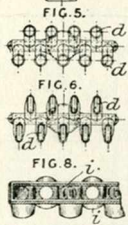
Thermostats.—In an apparatus for drying peat in furnace gases, a thermostat for controlling the supply of the gases may comprise a metal tube 20 closed at one end where it is attached to an internal rod of a more expansible material; the rod operates dampers 22, 21, 29 for checking the supply and for diverting excess.



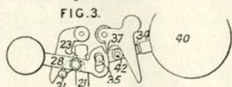
7695. **Kleyer, C.** June 18, 1913, [Convention date].



Radiators.—A radiator for use with stove flues consists of two parallel rows of tubes *d* connected at their ends to socket fittings *c*, *e*, which are connected respectively to a distributor *b* and a collector *f* carried respectively by an inlet member *a* and an outlet member *g*. The members *a* and *g* are connected to the flue and flare from the point of connexion to a rectangular cross-section, the apparatus being so proportioned that the total cross-sectional area of the passage for the gases through it is everywhere equal to that of the flues. The socket fittings *c*, *e* are interchangeable and are adapted to take tubes having different heating areas, two forms being shown in Figs. 5 and 6. The sockets of the members *b* and *f* are connected by knife-edge portions *i*, Fig. 8, to ensure a smooth passage of the gases. The parts are held together by rods *k* passing through lugs on the distributing and discharge members.



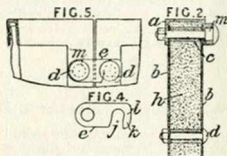
8142. **Armstrong, J. B.** May 31, 1913, [Convention date].



Steam-traps.—The outlet valve of a float trap is opened by the fall of a weighted lever 28, having a pin engaging in a short vertical slot in the valve-

rod 21, and is maintained open by a gravity catch 23 which engages a recess in the valve-rod; the lever 28 is released by a float 40 secured to an arm 34 independently mounted on the same axis as the lever. As the float rises, a pin 42 on the arm 34 disengages a gravity catch 37 from the lever 28. When the float falls, a pin 35 on the arm 34 engages a slot in the lever 28 so as to raise the weighted end, and the lever 28 is engaged and retained in this position by the catch 37. During the resetting of the lever 28, a pin 31 attached to the lever disengages the catch 23, allowing the valve to be closed by a spring. Specification 8368/07 is referred to.

9180. **Wheeler, S. B., and Wheeler, Ltd.,** S. April 11.



Fire-proof coverings.—The walls of fuel economizers, water, air, and gas heaters, &c., consist of unit panels or sections, with fastenings by means of which the units may rapidly be connected and disconnected. Fig. 2 shows a cross-section of a panel consisting of a frame *a* of channel-iron and two metal sheets *b*, stayed and spaced by ferrules *c* and bolts *d*, and enclosing a heat-insulating material *h*. Fig. 5 shows the corners of two such panels connected by hooks *e*, which are pivoted to the necks *m* of the bolts *d* on the edge of one section, and engage with the necks *m* of similar bolts on the adjacent edge of the next section. The hooks *e* have jaws *j*, Fig. 4, with an inclined part *k* which draws the edges of the sections together, and a recess *l* which prevent the hooks from leaving the necks *m* with which they engage. In a modification, the inner of the metal sheets *b* is replaced by an asbestos-cement sheet which is placed outside the channel *a*. The joints between the sections are made with asbestos or like cord or tape. The metal plates *b* may be corrugated or ribbed to stiffen them; in this case, the stay-bolts and ferrules may be omitted.

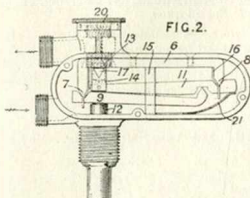
9233. **Schmidt, O.** April 12, 1913, [Convention date]. Drawings to Specification.

Heating-apparatus.—Aniline is used instead of water as a filling for Perkins' tubes.

9480. **Glover, T.** April 16.

Thermostats.—A gas valve 14 with triangular ports 17 is operated by an expansion rod 12

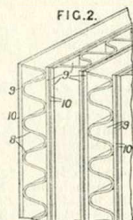
through two levers 9, 11 mounted on knife-edges 7, 8 on a plate 6. One end of the lever 9 is formed as an edge to bear against the other lever. The levers are guided by plates 15 and by loops



16 on the edges 7, 8. The seat 13 is screw-threaded and is removable through an opening in the casing closed by a cover 20. A spring 21 tends to open the valve.

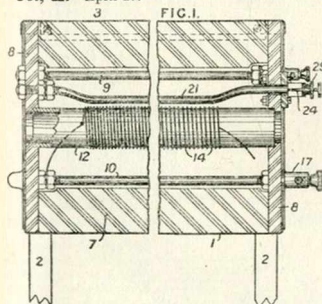
9771. **Wade, H.**, [Macey Co.]. April 20.

Fire-proof coverings.—A fire-proof filling for the walls of a light safe consists of layers of strawboard or the like, saturated with calcium or magnesium chloride and coated with gypsum. As shown, each layer may consist of a corrugated sheet 8 with a flat sheet 9 on either side, the outer surface of each flat sheet having a sustaining coating 10



of gypsum. Instead of using corrugated sheets of strawboard, other means may be adopted for providing a large number of air-spaces throughout the filling.

10,415. **Davies, J., and Gallenkamp & Co., A.** April 27.

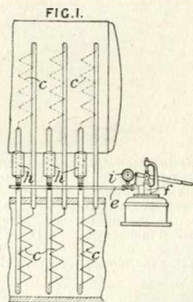


Thermostats.—An expansion thermostat for controlling an electric furnace comprises a metal rod 21 secured to one end wall of the furnace and passing freely through the other, which carries an adjustable screw 24 with which the rod 21 makes or breaks contact so as to cut off or reduce the heating current. The screw 24 may be secured in any position by a lock nut 29. Connexion is made to the far end of the rod 21 by one of the tie-rods holding the furnace together.

11,010. **Löwenstein, Karl, Prinz zu.** May 5.

Heating systems and apparatus.—In steam boilers heated by a series of Perkins' tubes or like elements fed by a common pipe, a three-way cock connects each element to this pipe and one of the

passages of this cock is connected to an expansion vessel $\frac{1}{2}$. The capacity of each expansion vessel $\frac{1}{2}$ may be about one-third of that of the Perkins' tube c . A single detachable expansion vessel may

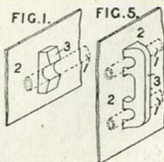


be used, screwed to each tube in turn. In working, the pump f may be allowed to fill the tubes, and the cocks may then be turned to connect the tubes with the expansion vessels. When the excess liquid has passed into these vessels, the cock may be turned to empty them through the feed-pipe e , leaving the tubes filled to the preferred extent of the two-thirds of their volume. Any tube may be tested for leakage or extent of filling by connecting it alone to the feed-pipe, on which a manometer i is provided. Gases formed by decomposition of the water may escape through the expansion vessels. When, for example, some tubes are of copper, which cannot stand high pressure, the tubes may be connected in groups to separate feed-pipes.

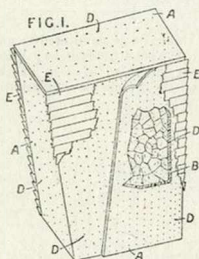
11,078. Wheeler, A. E., and Gould, H. W. June 23.

Heating systems.

—In a circulatory system for heating buildings, the heat is transmitted by conduction to one or more metallic plates by solid intermittent blocks of metal, the contact area of which with the plates is greater than the contact area with the pipes containing the heated fluid. Several forms which the invention may take are described and shown, among which are those shown in Figs. 1 and 5, in which the intermittent blocks of metal 3 carry the heating-pipes 1 and abut upon the radiating plates 2.

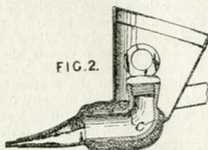


11,378. Piazza, C. Dec. 16, 1913.



Non-conducting coverings for heat.—A removable non-conducting lining for the ice compartments of refrigerators is composed of inner and outer layers A of wool and an intermediate layer B formed of a mixture of wax and fire-clay. The lining is provided with a number of holes D for the escape of vapour from melted ice. The sides of the ice compartment are formed of wood slats E.

11,522. Ingram, F. W., and Shea, C. A. May 9.



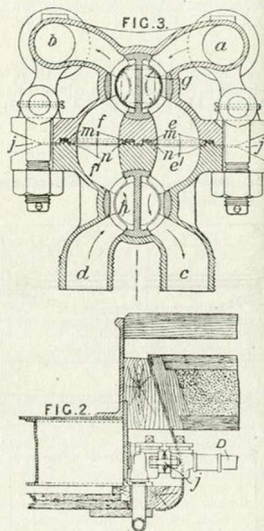
Hot-water bottles.—The metal neck c of a rubber hot-water bottle, water bed, &c. is bent as shown so that the neck is not twisted in screwing in or

unscrewing the stopper and the bottle can be laid on its side to be filled.

12,087. Saunders, S. M. Oct. 24. *Drawings to Specification.*

Radiators.—A radiating-element, to replace the ordinary skirting or to be embedded high up in the walls of a room, consists of a flat front-plate with a dished back-plate welded to it by the oxy-acetylene or similar process.

12,276. Haslam, Sir A. S. May 18.



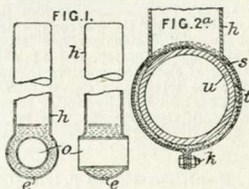
Heating by circulation of fluids.—An arrangement of cocks for pipe systems for circulating fluids, whereby a section can be cut off and bodily removed from the main system without interrupting the flow in the main system or wasting the fluid in the detached section, comprises a casing in two parts, each containing a four-way cock, so that, when coupled together, the two parts of the casing form flow and return passages from the section to the main system. The invention is described as applied to the refrigerating pipes D, Fig. 2, in the hatchways of the cold-storage chambers of ships. Fig. 3 shows a section through the cock casing, the two parts being secured together by bolts j and provided with packing ribs and grooves m, n. Normally the fluid flows from the pipe a and through the cock g, passage e, e', cock h, and pipe c, and returns from the pipe d through the cock h, passage f', f,

cock *g*, and return pipe *b*. When the section is to be disconnected the cocks are turned so as to confine the fluid in the branch pipes and to permit the fluid to flow from the pipe *a* through the cock *g* to the return pipe *b*, so that only the fluid in the passages *e*, *e'*, *f*, *f'* escapes.

12,375. Guntow, H. May 29, 1913, [Convention date].

Radiators. — In heating-apparatus comprising sealed elements containing easily vaporizable liquid under low pressure and heated by being placed in contact with a conduit containing heating-fluid, the element is arranged to surround the conduit wholly or in part, the exposed portion of the conduit in the latter case being covered with insulating-material. The element shown in Fig. 1 consists of a closed tube *h* having an enlarged spherical portion *e* at its

lower end, through which is formed an opening *o* for the heating-conduit. In the form shown in Fig. 2^a, the tube *h* fits over a portion of the conduit

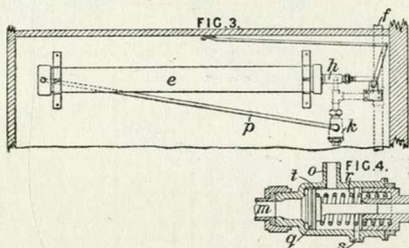


u, the remainder being covered with insulating-material *t*. The tube *h* and insulating-material *t* are held in place by a collar *s* secured by a bolt *k*.

12,705. Peters & Co., G. D., Russell, F. V., and Tiddeman, E. S. May 23.

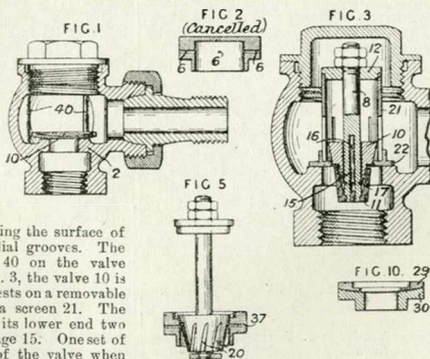
Heating vehicles. — To facilitate the initial heating of a radiator *e* used in a railway carriage and receiving a supply of steam from the train pipe *f* through a valve *h*, an auxiliary valve *k* is arranged to admit steam to the radiator when the driver increases the steam pressure in the train pipe above the normal. The higher-pressure steam entering at *m* overcomes the pressure of a spring *r* on the valve *q* which is thereby moved to uncover the port *o*, which is connected to the supplemental unit of the radiator by a pipe *p*. A vent *s* discharges

water from the radiator and also any leakage past the valve *q* and through a groove *t*.



14,180. Paul, A. G. June 19, 1913, [Convention date].

Steam-traps. — A valve and seat having capillary passages between them allow escape of water and air but not of steam; the flow of water through the passages causes the valve to rise so as to allow a greater outflow. In one form, Fig. 1, the valve consists of a convex disk 10, resting, preferably with line contact on a seat 2; the capillary passages may be formed by roughening the surface of the valve, or may consist of radial grooves. The valve may be guided by ribs 40 on the valve chamber. In a modification, Fig. 3, the valve 10 is mounted loosely on a rod 8 and rests on a removable seat or adapter 22 attached to a screen 21. The rod 8 carries a cup 11 and has at its lower end two sets of holes 16 joined by a passage 15. One set of holes 16 is just below the top of the valve when

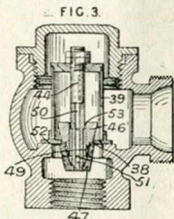
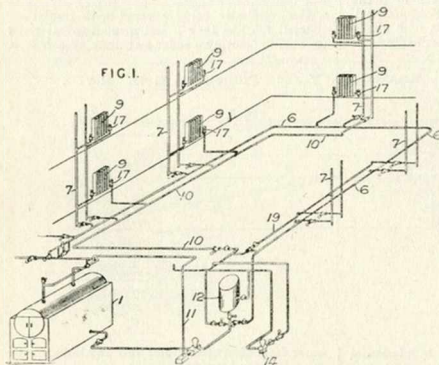


seated, and the other set is just below the bottom of the valve; the lower holes open into a groove 17. The size of the equalizing-passage may be varied by adjusting the rod 8. In a modification, capillary passages are provided through the sides of the cup, and the passage 15 extends to the top of the rod 8. In another modification, the cup 11 has a flange at the top, adapted, when the cup is raised, to close the aperture through the adapter 22; the valve has a convex surface and the adapter 22 is held down by a spring pressing on the collar 12. In the form shown in Fig. 5, the

valve 10 has inclined grooves 20, which are cut deeper towards the bottom, and the removable valve-seat is provided with passages 37. As shown in Fig. 10, the removable valve-seat may consist of two members 29, 30, with curved surfaces. In a modification, the valve-seat proper is screwed into an outer ring.

The Specification as open to inspection under Section 91 (3) (a) includes also the form of valve shown in Fig. 2 (*Cancelled*) having auxiliary passages 6. This subject-matter does not appear in the Specification as accepted.

14,181. Paul, A. G. Oct. 9, 1913, [Convention date].



Heating by circulation of fluids; steam-traps.—Relates to a system of radiators &c. designed to distribute the heating-fluid into all the other elements by the condensing power of any single element. Fig. 1 shows the arrangement of supply and return pipes on one system. The pump 14 draws the air out of the system and fills the radiators 9 with steam from the boiler 1 through pipes 6, 7, &c. Valves 17 allow the passage of air when there is a difference of pressure on the two sides, but prevent the passage of steam. After the steam has filled the radiators it becomes condensed and the water of condensation flows through the valves 17 and returns to the tank 12 through the pipes 10, 19, 11 thus securing a constant circulation, air being continuously removed by the pump 14. The pipes may also be arranged on a system

in which the water of condensation flows back to the boiler by gravity. The construction of the valves 17 is shown in Fig. 3. The valve 46 is seated on an annulus 38 forming the lower part of a casing 39, in the top of which is mounted an adjustable spindle 44 carrying a cup 49 into which the lower end 47 of the valve 46 fits. The spindle has a longitudinal channel 50 and small lateral openings 51 lead therefrom; openings 52 are formed in the cup. The valve is not seated closely, but leaves a capillary space so that air can pass round it and escape through the passages 50, 51, 52 or the passage 53. When condensed water reaches the valve, it sets up a flow which raises the valve and allows a free passage. The spindle can be moved vertically so as to adjust the position of the cups and thus regulate the action of the valve.

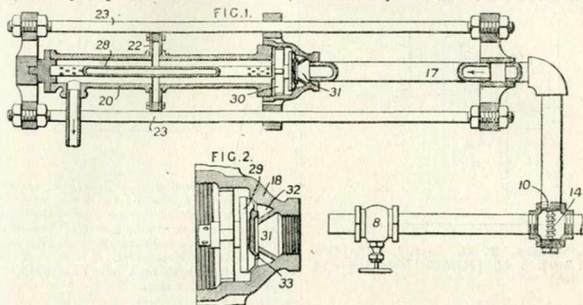
14,183. Woerner, L. June 28, 1913, [Convention date].

Steam-traps.—A valve-seat 18, Fig. 2, is provided with a nozzle 31 forming a recess 32 into which a

projection 33 on the valve 29 extends, so as to deflect fluid passing from a steam-pipe 17, Fig. 1, and prevent wearing of the valve surfaces. In the expansion trap shown in Fig. 1, the valve seat 18 is carried by the steam-pipe 17, and the valve by an expansion

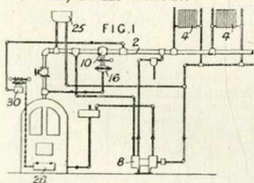
tube 28 surrounded by the discharge pipe 20. The opposite ends of the pipe 17 and rod 28 are connected by tie-rods 23. The rod 28 may carry a guide 30, and may be perforated as shown. The

pipe 20 is provided with an expansion joint 22. A sieve 10 is arranged at the entrance to the trap and is held in position by a spring 14; impurities may be removed by a cock 8.



14,280. Warren, Webster, & Co., and
Montreuil, F. H. June 13.

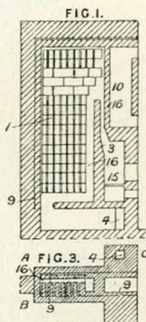
14,293. Räsänen, I. June 13.



Heating by circulation of fluids.—Relates to steam heating systems in which steam is also supplied from the boiler to cookers, pumps, &c. and especially to the pump for withdrawing air and water from the system, and consists in providing means whereby the steam supply to the heating system is shut off when the pressure falls too low to operate the air and water pump. Fig. 1 shows the arrangement, the radiators 4, pump 8, and cooker 25 being connected in parallel to the steam main 2. The steam is shut off automatically from the radiators 4 when the pressure falls below that necessary to operate the pump 8 by a valve 10, which is controlled by the pressure in the main 2 acting on a diaphragm 16. The connexions of the pump and cooker to the main are arranged on the boiler side of the valve 10. The door 28 of the furnace is also controlled by a diaphragm 30 operated by steam taken from the radiator side of the valve 10.

Heating buildings;

radiators.—The radiating surfaces of a stove which is built into the wall between two rooms, or at the junction of three or more rooms, form portions of the walls of the rooms. In the construction shown in Figs. 1 and 3, in which the stove serves for heating three rooms A, B, and C, the fire-place 15 is separated from the chamber 16 by a vertical wall 3, and the gases pass first to the top of the chamber and then downwards through a mass of heat-absorbing and radiating material 1. An insulating layer 9 of asbestos board prevents damage to the wall covering. In a modification, the gases from a single fire-place are passed through chambers 16 on two floors. In another form, boilers are arranged above the fire and in the chamber 16, and the hot water is utilized for heating remote rooms.

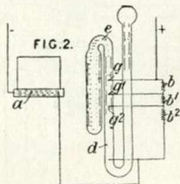


14,470. Berry, A. F. June 16.

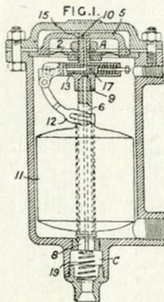
Thermostats.—A contact-thermometer controlling directly the insertion of one or more resistances

b, b', b'' in series with an electric heater *a* comprises a bent tube *e* containing an expansible liquid, such as glycerine, or alcohol, and mercury *d* which connects in circuit contacts *g, g', g''* connected with

the resistances. Several contact-thermometers may be used, each controlling a single resistance. Specification 18,604/89, [Class 38, Electricity, Regulating &c.], is referred to.

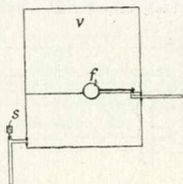


14,797. Ribes, P. C. Sept. 4, 1913, [Convention date]. Void. [Published under Section 91 of the Act.]



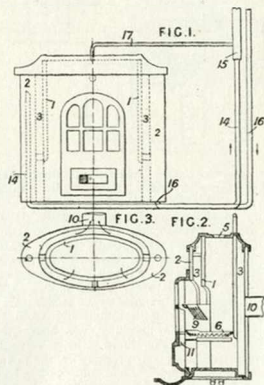
Steam-traps.—A float 11 controls the admission of steam to the space A above a diaphragm 2 operating the discharge valve 8, or connects this space with the outlet. The float 11 slides on a hollow stem 6 carrying the valve and is connected by a lever 12 with a hollow piston 13, which, in the position shown, allows steam to pass through the passage 15 to the space A so as to close the valve 8. The stem is screwed into a fitting 9 secured to the diaphragm by a nut and washers. The upper end 10 of the fitting 9 is guided in the cover 5 enclosing the space A. When the float rises by the accumulation of water, the piston is moved so as to cut off the steam, and connect the space A through a port 17 and the hollow stem 6 with the outlet C, so that the steam pressure on the lower side of the diaphragm opens the valve. When the trap is not working, the valve is opened by a spring 19. The trap may be surrounded by an annular reservoir.

14,897. Pickering, J. W., and Sadgrove, W. A. June 23.



Heating by circulation of fluids.—In systems for heating by circulation of hot water or other inelastic fluid, a closed vessel *v* is provided the upper part of which contains air &c., the increased pressure of which as the temperature rises is stated to improve the circulation. A safety-valve *s* discharges water, and a float valve *f* keeps the vessel *v* replenished with water.

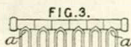
15,679. Chaboche, M. E. P. April 30, [Convention date].



Heating by circulation of fluids.—The course of the heated water from the boiler 1, 2, which is shown in horizontal section in Fig. 3 and in vertical section in Fig. 2, is shown in Fig. 1. The boiler comprises two concentric jackets 1, 2 which enclose the flue 3 and the central fuel chamber 5 above the grate 6 with the usual accessories. The boiler is elliptical in cross-section, and its jackets communicate with each other by suitable connecting-pipes. The chimney outlet is shown at 10.

The water circulation pipe 14 opens from the upper end of the jacket 2 and enters the mixing-chamber 15, to which steam is admitted by the pipe 17 from the upper portion of the jacket 1 for accelerating the circulation. The return pipe from the system is shown at 16. An expansion tank, air-discharge pipe, feed-supply pipe, overflow, and drain-pipe, are also provided.

15,844. **Fränkl, M., and Kuntze, G.,**
 [Firm of]. July 2.

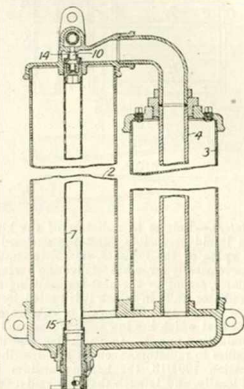


Radiators.—The sections of a radiator are bent double so as to produce a fork-shaped or channel-shaped plan, as shown. The opening in the middle of each section is omitted so as to present a solid surface at the bottom of the channel at *a*, cleaning-spaces being left between the sections, which are connected in the usual way at top and bottom.

16,531. **Barty, T.** July 10.

Radiators.—In systems in which the steam supply is controlled by a thermostat, the radiators or heat-radiating portions are composed of one or more elements operating on the non-storage principle and a separate element operating on the storage principle. Fig. 1 shows, in plan, a radiator composed of two elements arranged side by side. The storage element 3 is filled with heat-retaining

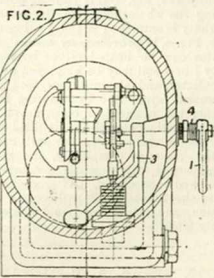
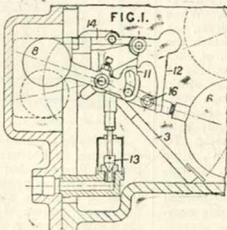
material, such as sodium acetate, and is fitted internally with a tube 4 to which steam is supplied by a valve 10 controlled by a thermostat 7 in the non-storage element 2. The steam is passed through



the elements in series and is finally condensed in the element 2, which is provided with holes 14, 15 for the escape of the water. The thermostat may be arranged to control the element 2, in which case the element 3 may be fitted on the supply side of the valve.

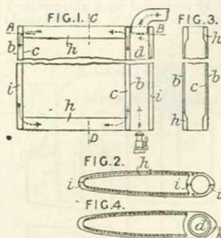
16,611. **Kermode, W. M. E., and Plummer, C. St. C.** July 11.

Steam-traps.—The working of a float-trap having trip-mechanism is tested by means of a hand-operated device which controls the admission of water from a boiler, or operates the trip-mechanism, or the float. As shown in Figs. 1 and 2, the lever 3 may be raised so as to lift the float 6 by means of a handle 1 mounted on a stem passing through a stuffing-box. A spring 4 returns the lever to the normal position, and a locking-device may be provided to hold the handle in the blow-off position. The mechanism is of the type described in Specification 8368/07, and consists of a weighted lever 8 which operates the discharge valve 13 through a lever 14, when a shoulder 11 is



tripped by the engagement of a roller 16 on the float lever with a cam-surface on a weighted catch 12.

16,680. Frank, H. July 13.

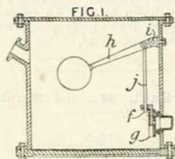


Radiators.—Relates to radiators of the kind in which a liquid or fusible substance enclosed in a narrow space of the radiator, small in comparison with the relatively large heat-delivering surface of the radiator, serves as the heat-transmitting agent to the radiator walls in which it is heated by fuel, steam, or electricity. The liquid or substance employed is that which has low specific heat and high heat-conducting power. In particular, the invention applies to radiators, such as are described in Specification 1204/13, the heating-medium being applied locally, and is such that the radiators can heat up quickly and cool down rapidly when the supply of heat is stopped. Fig. 1 shows, in vertical section, a radiator which embodies the invention; Fig. 2 an horizontal section on the line A-B; Fig. 3 a vertical cross-section on the line C-D, Fig. 1; and Fig. 4 a cross-section of the radiator when arranged for electric heating. Between the narrow sheets *b, c*, the liquid is contained, the eccentrically-situated passage *d* serving as a flue when, for example, gaseous fuel is employed. The liquid space opens at the top and bottom into an enlarged rim *h*, the space also being enlarged endways as shown at *i*, Fig. 2, this endlong enlargement extending the whole height of the radiator. When electricity is employed as the heating-medium, the coil *k*, Fig. 4, is provided, by means of which the radiator can be heated either by steam or electricity; or a coil may be employed at one side of the radiator, and steam or gas used at the other. To prevent injury due to straining through overheating, the radiator is constructed of elliptical form in elastic material and is filled entirely with the working liquid so that the walls may yield. To fill the radiator completely, the radiator, after being charged with its working substance, is overheated and then closed. After cooling down, the elastic sheet-metal walls will regain their normal position, any remaining liquid space being completely filled.

16,896. Wynn, A. E. July 16.

Steam-traps.—Apparatus of the float type is made with a comparatively deep casing, so that the discharge valve is held against its seating by a considerable fluid pressure. The float lever *h* is hinged

to a bracket *i* near the top of the casing and is connected to the discharge valve *f* by a vertical link *j*. The valve *f*, conveniently of dovetailed



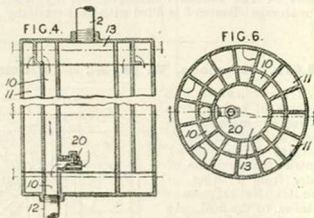
section, fits loosely between correspondingly-shaped guides *g*.

17,187. Gray, C. H. July 20.

Hot-water bottles.—In india-rubber hot-water bottles made with a seam and fold, the seam *A'* is placed to one side of the fold and a strengthening-strip *D* is placed symmetrically with reference to the fold. The invention is applicable to sheet rubber, rubber sheet reinforced with canvas, &c., and to flexible sheet material faced or treated with rubber.



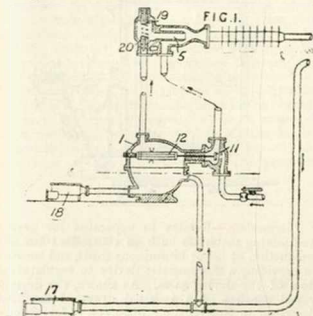
17,713. Tillman, M. D. July 27.



Heating by circulation of fluids.—For promoting circulation in hot-water heating-systems, the expansion line or other suitable part of the system is fitted with an apparatus in which is provided a series of alternate air and water columns. The first water column of the series is connected with the heater or boiler, and the last air column with the expansion pipe. Figs. 4 and 6 show one form of apparatus, Fig. 6 being a section on the line 6-6 of Fig. 4. The air and water columns are formed by vertical tubes or channels 11, 10 which are cast in a cylindrical drum and are connected successively with each other by openings alternately at the top and bottom. The sectional area of the air columns 11 is larger than that of the water columns 10,

preferably 2-2½ times as great. The first water column 10 is connected by a pipe 12 with the boiler, and the last air column communicates with the central space 13, which is connected with the expansion pipe 2. The apparatus, when in action, is intended to maintain a pressure of about 10 lb. in the system. For enabling the water to return quickly to the boiler from the expansion pipe when the system cools down, a by-pass valve 20 connects the first water column with the space 13.

17,860. **White, A. E.**, [Brevet Soc. Anon. des Anciens Etablissements A. Heints & Co.], July 28.

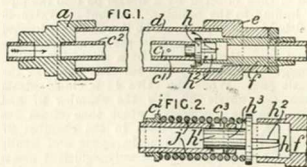


Heating buildings.—In steam heating-systems in which the waste steam is drawn through the system by an injector 5 operated by the incoming live steam, the supply of which is controlled by a valve 11 actuated by a thermostatic tube 12 in a vessel 1 through which the return steam passes, a steam-trap 17 is provided at the lowest point of the return pipe, so that the return steam enters the vessel 1 free of water of condensation. A second steam-trap 18 is attached to the vessel 1 to remove water condensing therein. Valves 19, 20 admit air and close the passage from the vessel 1 at the beginning and end of the operation of the system.

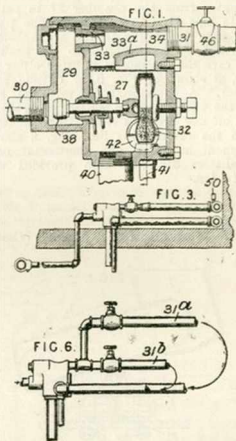
17,998. **Feod, J. J.** July 30.

Steam-traps of the expansion type consist of end castings *a, e* connected by a steel pipe *d*. The expansion tube *c* of copper is screwed into the inlet casting *a* and carries a valve *h* which closes the outlet formed in a part *f* screwed in the casting *e*. To prevent damage due to over-expansion, the valve *h* is resiliently supported by a spring *j* surrounding the tube *c* and abutting against a stop *i*. The valve *h* has a plug *h'* which is a sliding fit within the tube *c* and which has a

projecting pin *h'* working in slots *c'* in the tube *c*, which may have perforations *c'*. The valve is guided by webs *h'*.



18,058. **Gold, E. H.** July 30.

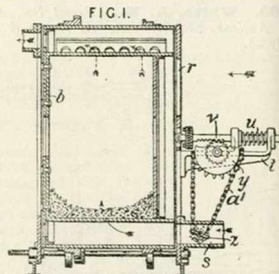


Heating buildings, ships, and vehicles.—Relates to low-pressure steam heating-systems of the kind provided with a thermostat and in which the shutting-off of the steam to the radiator or radiators prevents the passage of steam to the return pipe leading back to the thermostat. According to the present invention, the thermostat chamber is fitted between the steam inlet valve and the radiator inlet pipe, and means are provided whereby the steam normally passes to the radiator inlet pipe but when the radiator or radiators are cut out of service is directed immediately to the thermostat to keep it warm. Means are provided for separating water from steam at the return end of the radiator and for preventing steam from being drawn back into the radiator through the return pipe when the inlet end is

shut off. Fig. 1 shows one arrangement. The steam supplied through the pipe 30 and the thermostatic valve 38 passes into a chamber 29, and is then directed by a nozzle 33 into the pipe 31 leading to the radiator. A shut-off valve 46 is fitted in the pipe 31. The thermostat is located in the chamber 27 and is protected from the steam from the nozzle 33 by a shield 33^a. The passage 34 formed by this shield is flared at the nozzle end. When the valve 46 is closed, steam from the nozzle 33 fills the chamber 27 and surrounds the thermostat, which then closes the valve 38. When the steam in the chamber 27 condenses, the valve 38 again opens and finally reaches a position in which only sufficient steam is admitted to keep the thermostat warm. For separating the steam and water returning to the thermostat from the radiator, the end of the return pipe 32 is fitted with a dam 42, which is provided with a minute opening at the bottom to allow water from the chamber 27 to pass into the drain pipe 41. In addition to the pipe 41, another pipe 40 leading to the atmosphere may be provided. When applied to the heating of railway cars, the thermostat is fitted either inside the car, as shown in Fig. 3, or outside beneath the floor. A thermostat air valve 50, Fig. 3, breaks the vacuum in the radiator when the steam is shut off and prevents steam from passing back through the return pipe 32. Fig. 6 shows an arrangement in which one thermostat controls two radiators 31^a, 31^b, both provided with a shut-off valve.

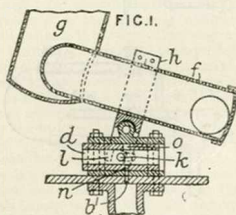
valve *d* consists of two closed hollow bodies *g*, *f* secured together at right-angles, the smaller *f* of the two being pivoted and containing a rolling counterweight. A pin *k* on the valve is engaged by forks *l* on straps *h* clamped about the body *f*. The valve has a port *n* registering with a port *b*¹ in the casing, and a port *o* on the opposite side to balance the pressure. The valve may be arranged to rotate.

18,354. Hobbs, J. E. Aug. 7.



Thermostats.—Relates to apparatus for drying and mixing materials such as those used for the production of tar or bituminous roads, and consists in providing a thermostatic device to regulate the flow of the drying gases. As shown, the drying-vessel consists of a jacketed drum of the kind described in Specification 18,355/14, [Class 34 (ii), Drying systems &c.]. Hot gases are passed to the drum from a flue *s*, which is provided with a damper *z* rotated as the temperature varies through chain gearing *a*¹, *y*. The pinion *y* is turned by a rack-bar *v* having on its end a roller engaging a flange on the drum. The bar slides in a bracket *t* fixed on a shield *r* and is pressed against the drum by a spring *u*. A graduated dial may be provided and a pointer on the shaft carrying the wheel *y*, or an electric circuit may be provided so as to actuate an alarm or switch a lamp in circuit on exceeding a certain temperature. When steam-heating is employed, a valve in the steam-supply pipe is operated instead of the damper.

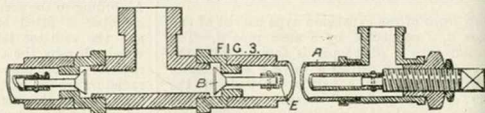
18,296. Rainchon, L. April 28, [Convention date].



Steam-traps.—A float operating a hollow piston

18,491. Crawford, J. G., and Sharp, E. S. Aug. 10.

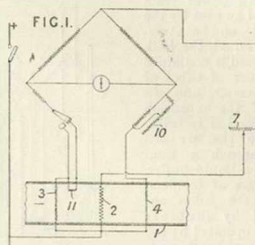
Thermostats.—A thermostat is applied to the water-trough of wet spinning frames to regulate the steam supply automatically and so maintain the water at a constant temperature. The steam-inlet tube *A* is fitted with one or more valves *B* controlled by a tube or bar *E* having a co-efficient of



expansion which is different from that of the tube *A*.

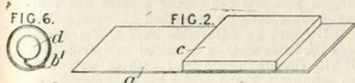
18,495. **Wilson, J. C., and Packard, H. N.** Aug. 16, 1913, [Concession date].

Thermostats.—In apparatus, particularly applicable to steam, gas, and like meters such as are described in Specification 30,405,09, [Class 54, Gas distribution], for measuring the difference in temperature between two given points, or maintaining a predetermined difference in temperature between such points, by means of the changes in electrical resistance due to temperature, one or both of the resistances is formed of substances so selected both as to nature and quantity that through a wide range of temperature a certain difference in resistance always corresponds to a fixed temperature difference. In the gas-meter shown, the gas flows through a conduit 1 and is heated by a resistance 2, its temperature before and after heating affecting resistance thermometers 3, 4 of equal resistance at equal temperatures, arranged in two adjacent arms of a wheatstone bridge, which is adapted to be initially balanced by an adjustable resistance 10. A constant temperature difference between the thermometers 3, 4 is automatically maintained by means of a rheostat 7 adapted to be controlled by suitable means from the wheatstone bridge to vary the heating current, which is measured by a wattmeter, whereby the flow of gas is also measured. When the gas is being heated, the difference in the resistance of the thermometers



3, 4, which are preferably formed of nickel wire, is balanced by a resistance 11, which is formed, for example, of nickel and manganese so proportioned as to compensate for the differences in the temperature-resistance coefficient of the nickel thermometers at different temperatures. Variations in the specific heat and moisture content of the gas may be similarly compensated.

19,296. **Snow, R. G.** Sept. 1.

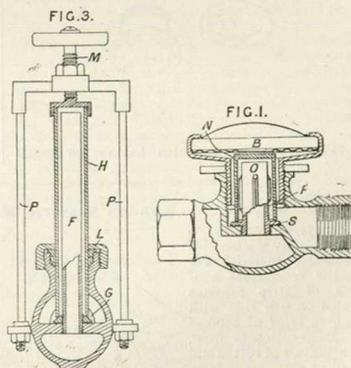


Non-conducting coverings for heat.—A slab of slag wool or like non-conducting material for covering steam and hot-water pipes is enveloped by a sheet of asbestos or similar material, which is so folded over the slag wool that when the covering is rolled around a dummy roller, a double thickness of asbestos sheeting is provided on the outer circumference and a single thickness on the inner circumference, and an overlapping lip on the sheeting is provided to cover the meeting edges of the covering. The slab *c*, Fig. 2, of non-conducting material is cemented to the folded-over end of an asbestos sheet *a*, a sufficient length of the folded-over part being left free to form, when the covering is rolled around a roller *d*, Fig. 6, an overlapping lip *b'*.

19,362. **Parsons, R.** Sept. 8, 1913.

Steam-traps.—A hollow discharge valve *N*, Fig. 1, surrounds an inner tube *O* and has its seat *S* at the bottom so as to leave an annular space *P*

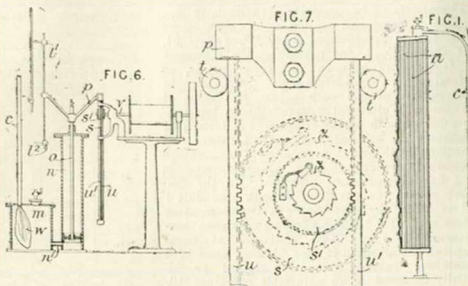
forming a seal. The valve may be operated by a capsule *B*, or, as shown in Fig. 3, the valve *H* may be arranged as an expansion tube, which is mounted by means of a screw *M* on a bridge



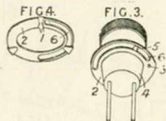
supported by rods *P*. A tube *F* passes into the valve *H* and carries a seat *G*. A stuffing-box *L* is provided. In a modification, the valve is of conical shape.

19,560. Snelling, J. C. Sept. 8.

Solar heat, utilizing.—In an apparatus for obtaining power from solar and like heat by the expansion and contraction of a liquid, the bulk of the liquid is contained in a number of tubes of small diameter, and the energy of the expansion and contraction is transmitted to the prime mover through a non-volatile liquid buffer. The changes of temperature of the tubes are controlled by shutters which are operated by the transmitting mechanism at the extremes of its movement. The tubes *a*, Fig. 1, containing alcohol, ether, toluol, or other liquid are connected to headers, the whole forming a closed system connected by a pipe *c* to a bag *w* immersed in the non-volatile liquid, filling a closed vessel *m* which communicates by a tube *n* with the working cylinder *n*. The rod *o* of the piston working in the cylinder *n* carries adjustable stops *p*, *p'* arranged to operate the shutters. The reciprocating motion of the piston is converted into rotary motion of a shaft *v* by the mechanism shown in Figs. 6 and 7. The



piston-rod *o* carries a cross-head *p* fitted with two racks *u*, *u'* guided by rollers *t* and gearing respectively with large and small pinions *s*, *s'* mounted loosely on the shaft *v*. During the expansion stroke, the pinion *s'* rotated by the rack *u'* drives, by means of a pawl, a ratchet-wheel *z* secured to the shaft *v*. During the contraction stroke, the pinion *s* rotated by the rack *u* drives, by means of a pawl, a second ratchet-wheel *z* secured to the shaft *v*.

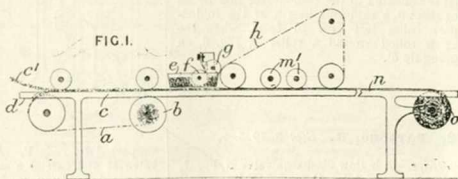
19,573. Hall, I. Sept. 9.


Thermostats.—In apparatus having differential

expansion members controlling a valve and indicating temperature, as described in Specification 21,072/12, with an adjustable head 4, Fig. 3, for setting the valve seat, as described in Specification 26,583/13, the head is provided with an adjustable index member 2, Fig. 4, which has a pointer 1 and a stop 3 co-operating with a fixed stop. A slot 6 in the index member allows of adjustment about a pin 5 which may be tightened to secure the member. A fixed scale is provided. In a modification, the stop and index are not carried by the head, but corresponding parts of the stationary mechanism are adjustable. Specifications 28,346/13 and 6016/14 are also referred to.

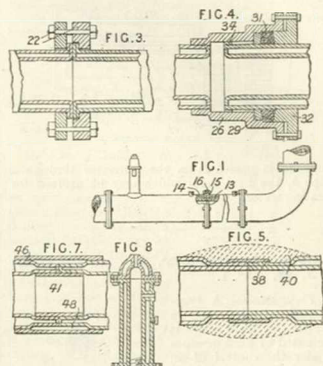
19,878. Teggin, W., London Electric Wire Co., and Smiths, Ltd. Sept. 17.

Fire-proof coverings.—A not readily combustible insulating material for electric conductors consists of strip asbestos coated on one side with an even layer of combed or carded cotton or wool, or a mixture of cotton and wool, or paper made from manilla, wood pulp, hemp, flax, jute, or mixtures of these substances, the whole being impregnated with rubber solution.



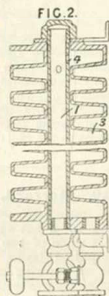
The making is carried out in a machine of known type, such as that shown in Fig. 1. The asbestos web *a*, fed from a roll *b* arranged under the table *c*, and the cotton *c'* carded into a thin layer of the same width as the asbestos, are fed forward at the same speed on to a delivery plate *d* and receive from a travelling-belt *h* a coating of the impregnating rubber solution fed in a film from the tank *e* by means of the roller *f*, *g*. Pressing rollers *m* may be employed to further the impregnation, and the material, after passing to a drying table *n*, is cut up or wound on to a roller *o*. When manilla or other paper is used, no carding or combing machine is necessary. A suitable rubber solution consists of about 8 per cent rubber dissolved in carbon disulphide, chlorhydrocarbons, benzene, or one of the fractions from the distillation of coal-tar, or mixtures of two or more of these substances.

down on the inner tubes, and the extremities of both turned up to form flanges, which may be bolted together or secured by collars. These joints may be surrounded by insulating-material 40.



20,022. Shanks, J. Sept. 22.

Radiators.—A unit of a radiator consists of a tube 1 surrounded by a hollow coil 3 which is formed as a casting. The steam, hot water, or other fluid passes through the tube and coil in turn, apertures 4 opening into one or more convolutions of the coil being provided in the end of the tube remote from the inlet connexion.



20,193. Filmer, G. E. Sept. 25.

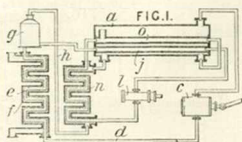
Non-conducting coverings for heat.—In pipe systems wherein the pipes are surrounded by exhaust or dead-air spaces for the purpose of insulation, the system is made in sections, the inner and outer tubes of each section being shaped to make contact at their ends and being united together. Fig. 1 shows part of a water main comprising elbow, straight, and T-sections; each section comprises inner and outer tubes 13, 14 joined at the ends by cross-plates 15. The sections are connected by bolted flanges 16 surrounding the pipes. In the form shown in Fig. 3, the ends of both tubes are turned up to form flanges, which are welded together. Annular castings 22 are disposed around the outer tubes, before the flanges are formed thereon, and are bolted together, gripping the flanges tightly. Alternatively, the flanges themselves may be bolted together. In another form, Fig. 5, the ends of the outer tubes are flattened down on the inner tubes and welded thereto, and they are externally screwed so that the sections may be connected by a screw coupling 38; or the ends of the outer tubes may be flattened

Fig. 7 shows a form of joint wherein internal and external screw couplings 41, 46 are used, and an additional insulating-space 48 is formed, filled with air or solid insulating-material. In the form shown in Fig. 4, the inner tube ends are flared to form a welded junction with the outer tube ends, which are screwed externally and may be joined by ordinary pipe couplings or by the expansion joint shown. This comprises a sleeve 26 screwed on one tube end and enclosing the adjacent end, which is fitted with a screw collar 34 sliding in the sleeve; packing 31 is secured between a ring 29 and a gland 32. In large mains, stiffening-webs may be used, formed of a concrete comprising asbestos, Portland cement, &c., and the sections are formed in parts, with flanges secured together. Fig. 8 shows a hydrant formed of two jacketed parts secured together by bolted flanges. A vacuum may be formed without the use of a pump by closing the exhaust opening in the jacket while the section is highly heated. If a pump is used, this should be done while the section is heated.

20,267. Beadle, C. H., and Power Progress, Ltd. Sept. 28.

Solar and natural heat, utilizing.—Energy is taken from a source of natural or waste heat by means of a solution which undergoes a cycle of thermal operations in a closed circuit wherein effusion of gas from the solution at one part of the cycle is effected solely by the heat of absorption at another part of the cycle. The energy may be utilized for warming purposes. In the arrangement shown in Fig. 1, the gas effused in the generator is utilized in a motor *c*, the exhaust of which passes to a

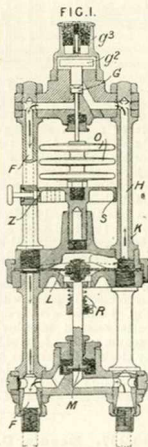
heating-coil *e* in a chamber *f* which is traversed by a current of air, brine, or water. The warmed gas then passes to a controlling-device *g* to which weak



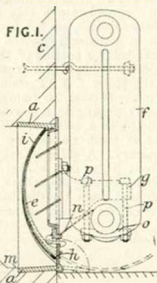
solution is passed from the generator through a pipe *h*, the heat from which may be utilized for heating water.

20,429. Jennings, F. W., and Playfair, J. M. Oct. 1.

Thermostats.—A thermostat of the type in which the main valve is actuated by fluid pressure under the control of an auxiliary valve which is itself under the control of a secondary auxiliary valve actuated by thermally controlled means has the connecting passages formed in hollow pillars forming part of the valve casing and has the thermal device adjustably mounted on the auxiliary valve casing. Fig. 1 shows the device arranged for actuation by vacuum. The auxiliary valve *M* is adjustably loaded by a spring *R* and is actuated by a diaphragm *L*. The diaphragm chamber has an adjustable air vent *g³* and is connected to the vacuum main through a lift valve *G* loaded by a weight *g²* and passages *H*, *F* formed in pillars *K*. The valve *G* is actuated by sealed bellows *O* containing an expansible liquid and mounted on a member *S* adjustably screwed into the casing and secured against rotation by a spring catch *Z*. Coils, rods, or metal chambers may be used in place of the bellows *O*. A modification is described adapted to be actuated by compressed air. The apparatus is covered with a glass shade held against a filter pad by a pivoted catch.



20,814. Nobbs, W. W. Oct. 10.

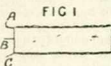


Radiators.—To facilitate the removal of the dust-collecting screen *e* in a ventilator *a*, the radiator *f* is suspended from brackets *g* by bolts *p* and saddles *o*. The upper end is supported as shown. The holes through which the bolts *p* are passed are made large enough to allow a little movement to the radiator.

21,410. Gerrard, A. W. March 22, 1915.

Hot-water bottles.—A covering for a hot-water bottle is made of two or more quilted layers of fabric. A covering may be made from sheeting consisting of a layer *B* of animal or vegetable wool, cellulose, jute, flax, or mixtures of fabrics made therefrom, a calico covering *C*, and a gauze lining *A*.

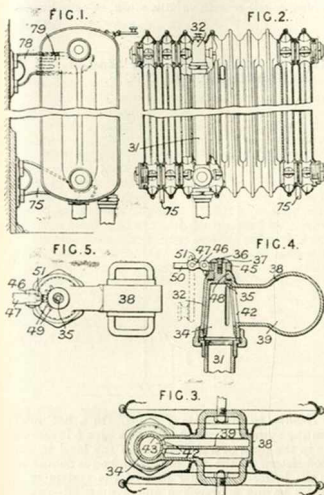
Reference has been directed by the Comptroller to Specifications 13,969/91 and 9432/04.



21,526. Safford, C. E. Oct. 26.

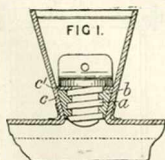
Radiators.—A radiator which can be adapted to single-pipe or two-pipe heating systems is divided into two groups of sections of different radiating capacity arranged so that either or both may be used. A supply pipe *31* is connected to a valve body *32* which has a tapering bore and contains a revoluble hollow plug *34* provided at the top with a projecting reduced neck *35*, which passes through a ring *45* held by a washer *37* and screw *36*. The body *32* has an extension *38* divided by a wall *33* into two parts, which are in communication with the respective groups of sections. Ports *43* in the plug are adapted to register with ports *42* in the body *32*, in which case both groups of sections are heated. By rotating the plug, either group may be heated, or the heating-fluid may be cut off entirely. The plug is held in the desired position by means of a small arm *47* pivoted between lugs

46 on the ring 45 and having a finger 48 adapted to engage teeth 49. A handle 50 pivoted to the outer end of the arm 47 has a lug 51 to lift the arm 47 so that the finger 48 clears the teeth 49.



The condensate from the two groups of elements passes through a partitioned fitting and thence through weighted check valves to the supply or return pipe, according as the radiator is fitted in a single-pipe or two-pipe system. The radiator is supported on pivoted brackets 75, 78, of which the upper bracket 78 is provided with an adjustable portion 79.

21,768. Rowe, T. Oct. 30.

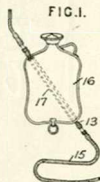


Hot-water bottles.—The stopper of a rubber hot-water bottle, water bed, &c. is screwed into a thread formed in the rubber of which the neck of the bottle &c. is made. The neck is formed

by covering a mandrel having a coarse thread, such as is shown on the stopper *a* with a rubber compound *b* which produces a hard material when vulcanized. This compound is covered with the usual soft rubber *c* forming the body of the bottle &c. The stopper seating *c'* may be formed integral with the neck.

21,890. Meinecke & Co., [Assignees of *Meinecke, C. W.*]. Oct. 31, 1913, [Convention date].

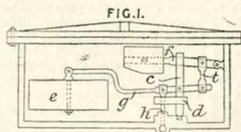
Hot-water bottles.—A metal or other hot-water bottle 16 is formed with an open tube 17 passing therethrough so that the delivery tube 13 of a surgical irrigator may be passed through the bottle and the injection liquid may thus be heated. The hot-water bottle may be used for its ordinary purpose when the tube 13 is removed. In modifications, a curved tube or a plurality of tubes may be formed in the bottle.



22,080. Porter, J. E. Nov. 5.

Non-conducting coverings for heat.—A porous composition made by fusing together sand, powdered glass, and infusorial earth is used as a heat-insulating material.

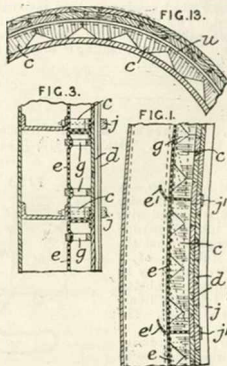
22,110. Hensher, A. E. Nov. 6.



Steam-traps.—A float-actuated steam-trap is fitted with an independent counterbalance lever linked to the float lever. The valve member *b* is guided by a member *d* secured to a post *c*, which carries the pivot of the float lever. The float lever *g* is pivoted at one end to the earthenware float *e*, and at the other end is connected by a link *t* to a counterbalance lever *f* pivoted to the casing.

Reference has been directed by the Comptroller to Specification 20,922/01.

22,173. Franklin, R. Nov. 7.



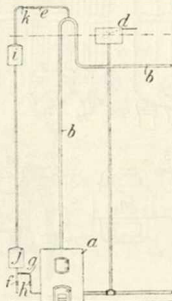
Non-conducting coverings for heat.—A heat-insulating lining is built up of panels each having a boarded front and a wire-netting casing at the back to contain the insulating-material, notched firring being used to support the panels at one side. In a lining for a ship's refrigerating-chamber, the notched firrings *c*, Figs. 1 and 3, form the lower sides of the panels, and the wire netting *e* is spaced away from the boarded fronts *d* by battens *g*. The wire-netting casings are bent out at the top to form gutters *e'* to catch loose insulating-material. Vertical protecting-battens *j* and iron strips *j'* are provided on the front of the panels. In modifications, the notched firrings along the sides of the panels are dispensed with, and short firrings are bolted to the ship's frames or deck beams to support the panels. The panels may form a portable deck covering. They may be secured to the longitudinal grounds or ceiling joists of a building. The firrings of an arched covering, such as the covering of a propeller-shaft tunnel, are built up of blocks *c*, Fig. 13, joined together by a metal strip *u*.

22,242. Marks, E. C. R., [McNabb, W. F.].
Nov. 9.

Heating by chemical action.—A mixture for producing heat by chemical action with water consists of a caustic alkali in solid form such as potassium or sodium hydrate, with an oxidizable substance such as oxalic or tartaric acid, and an oxidizing-agent such as a persulphate. The mixture may be used for warming food in an air-tight can, as a disinfectant, and for cleaning sewers and sanitary appliances. Suitable proportions are 15 gm. of sodium hydroxide, 5 gm. of oxalic acid crystals, and 5 gm. of potassium persulphate, to which half

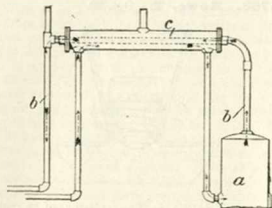
a gm. of potassium nitrate and 3 gm. of tartaric acid may be added, and, in order to produce greater heat, half a gm. of finely divided or granulated aluminium. When used as a disinfectant, three-tenths of a gm. of bichloride of mercury may be added, together with vanilla, musk, or camphor.

22,372. Haden, W. N., Haden, C. I.,
and Horton, F. H. Nov. 11.



Heating by circulation of fluids.—In a hot-water heating system in which the flow pipe *b* is carried up in the form of a siphon above the level in the feed-cistern *d*, the top of the siphon is connected to the boiler *a* or other part of the system by a pipe *e* having a branch *g* and a draw-off cock *f*. Two air-tight cylinders *i, j* are fitted to the pipe *e*, preferably in the position shown. Air is removed from the siphon for starting the circulation by closing a valve *h* in the pipe *g* and opening the valve *f*. When the circulation has started, the valve *h* is opened, and the valve *f* shut. A relief valve *k* may be fitted to the pipe *e*.

22,420. Bent, J. B. Nov. 12.



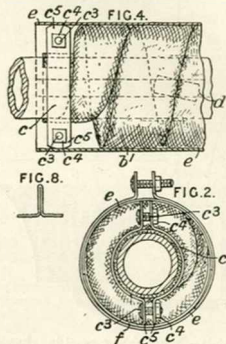
Heating buildings.—In a hot-water heating system, steam in the flow pipe is condensed, and

return water is heated, by passing the return water through a jacket or enlarged pipe *c* around a part

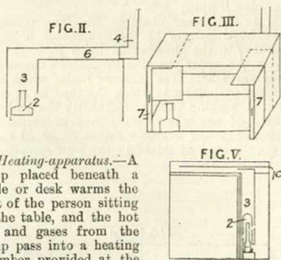
of the main flow pipe *b* connected directly to the boiler *a*.

22,439. Herdman, G. A. Nov. 12.

Non-conducting coverings for heat.—In a heat-insulating covering for pipes, and of the kind in which long narrow bags filled with slagwool are wound helically around the pipes, means are provided for securing the ends of the bags in place, and an outer casing is provided, having means for holding it in position, pressure on the bags being prevented by distance-pieces disposed between the pipe and the casing. The ends of the bag *b'* of scrim or other material are held on the pipe by clamps *c*, which may each comprise two strips of bowed metal held together by screws *c'* with nuts *c''*. One screw and nut may be replaced by a rivet, or the clamp may be formed as one strip of metal having its ends held together by a screw and nut. The ends *c'* of the clamps serve as distance-pieces between the pipe and the casing *e*, other distance-pieces *d* of the shape shown in Fig. 8 being provided between the convolutions of the bag. The casing *e*, which is divided longitudinally into two parts, is held in position by clamps *f*.



22,551. Eiloart, A. Nov. 14.



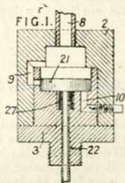
Heating-apparatus.—A lamp placed beneath a table or desk warms the feet of the person sitting at the table, and the hot air and gases from the lamp pass into a heating chamber provided at the top of the table. The oil, gas, or electric lamp 2, Fig. II, is placed beneath a chamber 3, which may open directly through the top of the table or may communicate with a chimney 4 at the further end of the table through a space 6 beneath the top. The top is made wholly or partly of metal. The space 6 may be made to open to insert a kettle or the like, and articles may be warmed by placing them inside the space. The space 6 may be provided with a baffle-plate 1^c, Fig. V, and the gases may escape through apertures in the side of the table. The sides of a table may be provided with sliding metal plates 7 which serve as heat conductors and as screens. The table may be collapsible and made entirely of metal, and hot

air from any source may be circulated beneath the top.

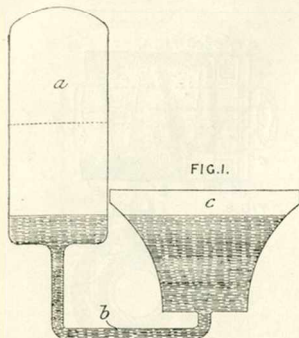
Reference has been directed by the Comptroller to Specification 3819/89, [Class 126, Stoves &c.].

22,642. Vincent, L. N. Nov. 17, 1913, [Convention date]. Void. [Published under Section 91 of the Act.]

Steam-traps.—A valve device for draining the water of condensation from steam-pipes, steam cylinders, &c., has a piston valve member 21 adapted to be depressed against the action of a spring 27 by pressure admitted through a pipe 8 so as to close inlet drain ports 9, 10. The valve member is provided with a ported tubular stem 22 to act as a discharge passage. The valve member and spring are mounted in a plug member 3 detachably secured in the casing 2 and provided with a screwed boss to enable the device to be secured to a suitable support. In a modification, a series of inlet ports 9, 10 is provided.



22,687. Marsh, R. G., and Walter, C. M. Nov. 18.



Thermostats.—Mechanism controlling changes of pressure or temperature comprises a closed air or gas containing chamber *a* connected by a liquid tube *b* to a float chamber *c* so formed that the float has equal or other suitable predetermined movements for each increment of pressure of the gas. Means may be provided for obturating the passage *b* and for emptying the chamber *c* to facilitate transport.

22,734. Walles, Dove, & Co., and Macdonald, C. Nov. 18.

Non-conducting coverings for heat and sound.—An improved flooring for ships' decks and like surfaces comprises a bituminous solution 2 covering the metal surface 1, a layer of bituminous enamel 3

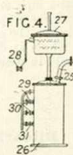
secured thereto, and an upper layer of cementitious or bituminous material applied in sections 5, preferably square. The channels 6 between the sections are filled up with strips of bituminous



enamel or any kind of wax or india-rubber material or composition capable of expansion and contraction so that the floor will not buckle or rise up. To lay the sections in place, the material 5 is moulded between bars which are afterwards removed, the spaces or channels so formed being then filled up, as described above. Specification 26,729/13 is referred to.

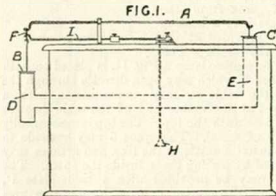
22,844. Soc. E. Barbet et fils et Cie. July 10, [Convention date].

Thermostats.—In controlling the working temperature of a multiple effect evaporating apparatus, the supply of steam to the first effect is controlled by the pressure of the steam in the heating-drum of one of the succeeding effects. The regulator consists of two chambers 27, 26 connected by a pipe dipping into liquid in the lower chamber 26. The pressure in the heating-drum of the evaporator is communicated to the chamber 26 by a pipe 25. A float in the upper chamber 27 controls the steam supply valve 28. The pressure under which the particular evaporator to which the pipe 25 is connected is working (and consequently the rate of working of the whole plant) may be varied by opening or closing overflow valves 29, 30, 31 so as to vary the head of liquid in the pipe connecting the chambers 27, 26.



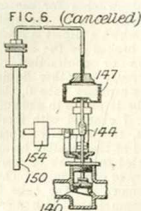
22,896. Fairall, J. Nov. 23.

Thermostats.—Relates to means for controlling the heating of an insulator, and consists in pivoting the lever A, upon the ends of which the dampers B, C over the heating-lamp and over the end of the flue E are suspended, at one-third of the length of the lever from the lamp end. When the capsule H expands, it lifts a rod I engaging in a slot in a plate F at the lamp end of the lever A, thus allowing the lever to tilt so that the damper C closes the end of the flue E and the damper B opens the end of the lamp chimney D.

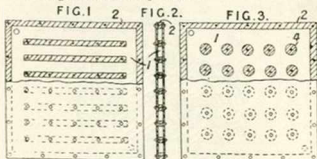


- 23,384. **Giles, J. H., and Giles, D. M.**
 Dec. 29, 1913, [Convention date].

Thermostats.—The Specification as open to inspection under Section 91 (3) (a) describes a thermostat, for controlling the supply of steam in a dyeing &c. apparatus, consisting of a spring bellows 147 in communication with a capsule 150 containing suitable expansive fluid, and connected to the steam valve 140 through a link 144. The parts are returned by a counterweight 154. This subject-matter does not appear in the Specification as accepted.



medium. If desired, supporting-pieces 4 of circular or rectangular form may be used.

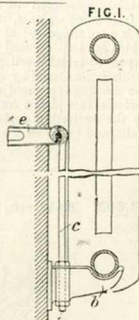


- 23,445. **Cronholm, N. C. F., Höög, A. J., and Nilson, F. O.** Dec. 3, 1913, [Convention date]. *Void.* [Published under Section 91 of the Act.]

Radiators or heating elements are made from fibrous materials such as asbestos mixed with a binding-agent, such as Portland cement, and can be pressed or moulded and reinforced with wire netting. Plates 1 secured to a frame 2 form a hollow element for the passage of the heating-

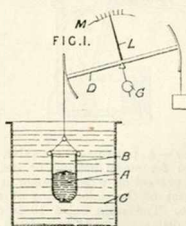
- 23,493. **Taylor, E.**
 J. Dec. 3.

Radiators.—A radiator is supported by rods *c* suspended from staples or brackets *e* near the top of the radiator and carrying brackets *b* on which the bottom of the radiator rests.



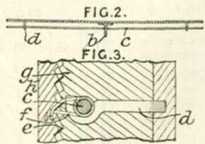
- 23,564. **Simmance, J. F.** Dec. 4.

Thermostats.—A method of indicating, recording, or regulating the temperature of fluids consists in submerging in the fluid a vessel slung from a balance and containing a second fluid the rate of heat-expansion of which is different from that of the first fluid, the balance being compensated so that, as the suspended vessel rises and falls on changes of temperature in the first fluid, a less or greater counterbalancing force is presented to it by the balance to maintain the vessel submerged, and the movement of the suspended vessel being utilized to measure or regulate the temperature. Where the difference in temperature between two liquids is to be measured or regulated, two such vessels are suspended from the oppositely-acting parts of a balance. In the form shown in Fig. 1, a vessel B open at the top and containing mercury A is suspended in the liquid C, the temperature of which is to be measured &c., and the balance D from which it is suspended is fitted with a compensating-weight G adapted to limit the rising and falling movement of the vessel B as the temperature varies, the movement of the balance causing a pointer L to sweep over a scale M, or a regulating-device &c. to be operated. The compensating-weight G may be adjustable, so that interchangeable scales of different sensitiveness may be employed.



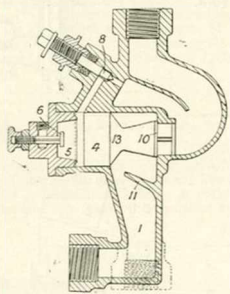
The suspended vessel B may be in the form of one or more hermetically-sealed envelopes containing expansive liquid or gas. The movement of the suspended vessel, or the relative movement of two such vessels suspended from the opposite arms of a balance, may also be utilized to operate a valve, switch, &c. controlling a heating or cooling medium or apparatus.

23,577. **Lizieri, G.** Dec. 4.



Non-conducting coverings for heat.—To apply insulating-material to the walls of ships' cabin*, refrigerating - plants, or other structures, loose rods *c* are supported at a distance from the walls, which are then covered with insulating-material *g*; expanded-metal sheeting *e* is then held against the insulating-material by wire ties *f* on the rods, and the sheeting is covered with a layer *h* of insulating-material in a plastic form. The rods are supported by the projecting angle-bars *b* or the like on the walls, and by hooks *d* screwed into the walls.

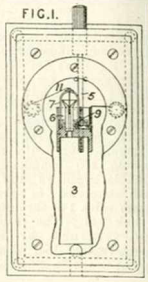
23,603. **Baldwin, A.** Dec. 5.



Steam-traps.—A pressure-relief valve, particularly adapted for steam heating or steam supply systems for preventing water-hammer, is actuated by the impact of the water acting on a loose-y-fitting piston. The main valve 10 is connected by a conical distance-piece 13 to a piston 4 loosely fitting in a cylinder 5, provided with an automatic air-outlet valve 6 and a manually adjustable air-outlet valve 8. The inlet 1 is provided with a deflector plate 11, adapted to direct any water in the steam-pipe on to the piston 4 to open the valve 10. When the water has been discharged and the water-hammer pressure relieved, the flow of steam past the valve, together with the pressure on the back of the piston and the weight of the piston and valve member, closes the valve.

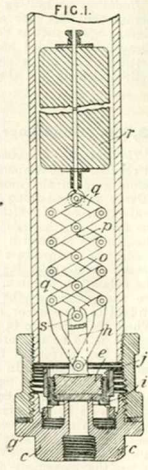
23,778. **Wilkinson, G.** Dec. 9.

Thermostats.—In thermal switches for use as thermostats, of the kind in which a circuit is made or broken by the expansion or contraction of mercury or other liquid in a capillary tube 6, the tube is placed in a chamber 7 charged with inert gas, the bottom or open end of the chamber being sealed in a bath of mercury or other fluid. The mercury in the tube 6 communicates with mercury in a reservoir 3, the capacity of which can be adjusted by a screw 5 in order to adjust the temperature at which the mercury makes contact with a wire 11. A slot 9 is provided in the bottom edge of the chamber 7, through which a rubber tube may be passed when charging the chamber with inert gas.

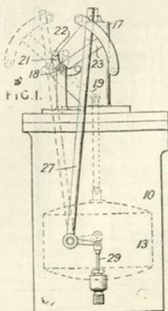


23,910. **Spencer, Ltd., J., and Horton, S.** Dec. 11.

Steam-traps.—In valves for releasing liquids from high or low pressure pipe systems when a certain head is exceeded, a float *r* is connected to a lift valve *e* by a lazy-tongs device *o*. The valve seat is formed on a union piece *c* which supports a tubular valve guide *g* having grooves *j* to prevent the rotation of the valve member. The guide *g* has two upwardly projecting arms *h* forming the support of the fixed fulcrum pin *s* of the lazy-tongs, the levers *q* of which are preferably in duplicate, separated by distance-pieces *p* at their central pivots to give lateral stability.

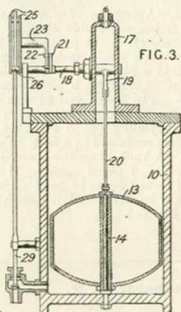


24,173. Allison, J. J. C., and Waller, J. Dec. 16.



Steam-traps.—Apparatus of the float type comprises a casing 10 having a float 13 sliding on a spindle 14 and connected by a link 20 to a crank-arm 19 formed on a shaft 18, which is journaled in a hollow casting 17 on the top of the casing 10. A crescent-shaped member 21 having a pin 22 at each extremity is secured to the shaft 18. A right-angled arm 23 is loosely mounted on the shaft in

advance of the member 21, and supports a quadrant composed of two plates 25 spaced by cross-pins 26. One arm of a bell-crank lever 27 projects between the plates 25, and the other engages the spindle 29

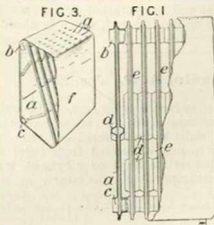


of the discharge valve. In operation, the rise of the float causes one of the pins 22 to raise the arm 23 until it topples over and causes one of the pins 26 suddenly to come into contact with one arm of the bell-crank lever 27 and so lift the discharge valve.

A.D. 1915.

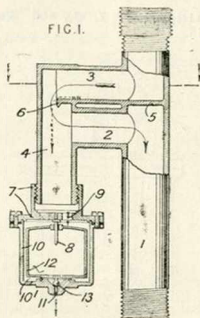
60. La Poëze, G. Y. O. J. M. Comte de. Jan. 26, 1914, [Convention date].

Radiators for heating buildings are made with elements *a* of triangular shape with upper and lower connecting-pipes *b*, *c* respectively. The elements are made from two sheets hooked together at the edges and formed on their vertical faces with fins *d*, which are not parallel, the widening *e* being made so as to accommodate changes in the volume of air as it is heated by passage over the fins. A casing *f*, *g* is provided with perforations, as shown, for the passage of the warmed air.

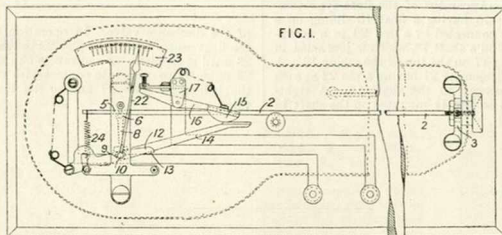


- 514. Schleinger, C. A., Schleinger, O., and Keller, J.** Jan. 13, 1914, [Convention date].

Steam-traps.—Apparatus of the float type for draining gas-mains, applicable also for use with steam-pipes, comprises a pipe section 1 with a partition 5 between two branch pipes 2, 3, which are connected to a pipe 4 parallel to the pipe 1. The front edge of the pipe 3 is provided with a dipping lip 6. The lower end of the pipe 4 is closed by a disk 7 having perforations 9 and a downwardly projecting pin 8 to guide a hollow float 12, which is contained in a tank 10 connected to the disk 7. A knob 13 on the lower side of the float is guided in a coned opening 11 having a raised edge to form a recess 10' to catch impurities. The pipe 1 may be horizontal, in which case the pipes 2, 3 are omitted.



- 1212. Pritchard, W. T.** Jan. 25. No Patent granted (Sealing fee not paid).

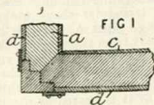


Thermostats.—A thermostat for cutting in or out of circuit electric heating-appliances comprises an expandible member 2, preferably an aluminium tube, carrying a rack 5 which is adapted, on expansion or contraction of the tube, to operate through intervening mechanism a countershaft 10 carrying an arm 12 formed with a projection 13 engaging a balanced contact-arm 14. The tube 2 is adjustably secured at one end to a bracket 3, the rack teeth formed on its free end, which is closed and

flattened. The teeth engage a pinion 6, the shaft of which carries a toothed sector 8 engaging a second pinion 9 on the countershaft 10. The balanced contact-arm 14 is adapted to engage the carbon head 15 of a switch arm 16 pivoted to a bracket 17. The rod 22 is maintained in positive but elastic mesh with the pinion 6 by a spring 24, and a hand or pointer 22, moving over a temperature scale 23, is provided on the countershaft 10.

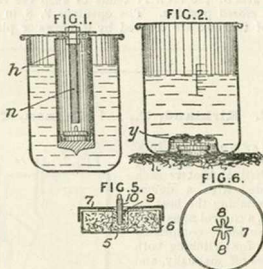
- 1276. Lundin, A. P.** Jan. 26.

Non-conducting coverings for heat.—The walls of a refrigerator are made of waterproofed balsa wood. The walls *a* are covered on their outer surfaces with panels *d* formed from balsa wood pulp. The panels are sized or otherwise treated to render them impervious to moisture.



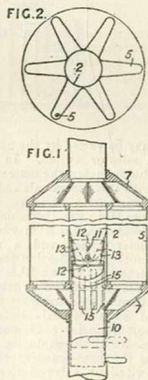
1745. **La Cour, D., and Schou, C. V.** Oct. 13, 1914, [Convention date].

Heating by chemical action.—In a cartridge containing a mixture, such as an oxidizable metal and a metal oxide, which is brought into reaction by a more readily combustible mixture, the combustion is started by lighting a fusee adapted to be inserted in the cartridge immediately before use. The top of the cartridge 6, Fig. 5, is covered by a layer of paper and by a lid 7 having a central aperture 9, through which the fusee 10 is inserted into the readily combustible mixture 5. Pointed projections 8, Fig. 6, hold the fusee firmly in position. The cartridge contains a mixture of aluminium powder and iron oxide, and a readily combustible mixture of magnesium powder and copper oxide with, preferably, some aluminium and iron oxide mixture to reduce the speed of combustion. To heat liquids, the cartridge may be placed in a cylinder *h*, Fig. 1, inside the liquid container. The fusee is lit by a match thrown down a tube *n* projecting into the cylinder. The container may be formed with a recessed bottom *y*, Fig. 2, so that it may be placed over the cartridge.



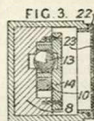
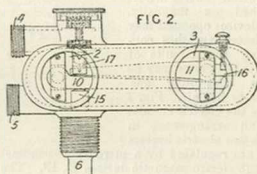
1826. **Curtis, A. H.** Feb. 4.

Radiators.—A radiator heated by waste gases from chimneys or by other waste fluids, such as steam-engine exhausts, consists of hollow fins radiating from the pipe or flue 2, and forming a passage for the hot fluids. As shown, the fins 5 are arranged round a central pipe 2 and connect headers 7, which also are fluted. To divert the gases into or out of the radiator, a vertically sliding pipe 10, with hit-and-miss apertures 15, is fitted with a damper 11 consisting of two parts mounted on a central horizontal pivot 12 and normally suspended by chains 13. As the pipe 10 is raised, carrying with it the pivot 12, the circumferential parts of the damper fall relatively to it, as shown in dotted lines, and leave a clear passage through the pipe 2. In a modification, the fins radiate from one side only of the pipe 2.



1927. **Glover, T.** Feb. 6.

Thermostats.—In apparatus for controlling the gas supply to burners of the kind in which the gas valve is operated by an expanding rod acting through levers enclosed in a gas-tight box, the levers are supported on ball bearings, and the gas-tight box is provided with openings through which the mechanism between the expanding rod and the gas valve may be assembled and removed. The rod 15, Fig. 2, supported in a tube 6, which expands more than the rod, presses against the bottom of a lever 10, the end of which is formed with a knife-edge 16 bearing against the shorter arm of a lever 11 carrying the valve 17 regulating the passage of gas from the inlet 4 to the outlet 5. The levers are supported by balls 13, Fig. 3, inserted in holes in the levers and held in recesses



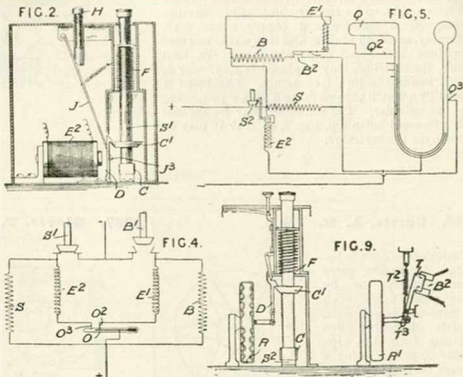
in blocks 8 on the sides of the box and in plates 14 secured to the blocks by screws. A spring on the short arm of the lever 11 tends to keep the valve in its closed position. The openings 2, 3 in the side of the box are covered by windows or plates

23 carried in screwed rings 22. When a tube 6, which expands less than the rod, is used, the lever 10 and the spring act upon the long arm of the lever 11, and the short arm is dispensed with.

2012. Kirkland, T., and Kiernan, T. J. R. Feb. 8.

Thermostats.—In a heating system employing two distinct heaters each provided with a device for switching the heat on or off, a control apparatus is provided comprising means for switching both heaters off manually, and a thermometric regulation by which one heater is automatically switched off at a predetermined upper temperature, and the other heater is automatically switched off at a higher predetermined temperature and remains switched off until switched on manually. The devices operated may be electric switches controlling the circuits of electric heaters or may be valves controlling gas, steam, or hot air. Fig. 4 shows the electric circuits for an arrangement in which two electric heaters

B, S are regulated by a mercury thermometer O through electro-magnetic devices E^1 , E^2 . The contact member C of the switch for each heater is carried by a plunger B^1 or S^1 fitted with a collar C^1 , Fig. 2, adapted to be engaged by a spring-pressed hook D forming the armature of the corresponding electro-magnet E^1 or E^2 . Each plunger is pressed down manually to place the corresponding heater in circuit, and is raised by a spring F to open the switch when released from the hook D either manually or automatically. The manual release is effected by pressing down a spring plunger H which bears on a spring-controlled pivoted arm J carrying two pins J^1 , one bearing against each hook D. The automatic release is effected by the closing of a circuit in the bore of the thermometer and through the electro-magnet E^1 or E^2 when the mercury contacts with the wire Q^1 or Q^2 . Fig. 5 shows a modified arrangement employing an air thermometer Q, in which the switch B^2 controlling the heater B is opened and closed automatically according as the temperature rises above or falls below that corresponding to the position of the wire Q^1 , unless the temperature rises above that corresponding to the position of the wire Q^2 , whereupon both switches B^2 , S^2 are opened and can only be closed manually. The temperature corresponding to the wire Q^2



may be varied by the use of multiple contacts and a selector switch. In case of breakage of the thermometer, the mercury falls into a cavity fitted with three terminals and completes the circuits for closing both switches. To avoid sparking at the wire Q^1 in the thermometer tube, the coil of the electro-magnet E^1 may be provided with a potentiometer device and a non-inductive shunt. In another modification employing a mercury thermometer, the switch B^2 is a double-throw switch, and trembling of the switch arm and sparking in the thermometer tube are prevented by the provision of an additional electro-magnetic device and a potentiometer resistance. Fig. 9 shows a further modification employing expansible capsules R, R^1 as the heat-sensitive elements for operating the switch or valve devices S^1 , B^1 respectively. At the lower of the two upper temperatures, the capsule R^1 operates the lever T of the device B^2 through a pin-and-slot connexion at T^1 and against the action of a spring T^2 . At the higher of the two upper temperatures, the capsule R operates the hook D to allow the spring F to operate the device S^2 , whereupon the device B^2 being under master control from the device S^2 is also operated, and both devices can then only be restored manually. The invention is applicable to the maintaining of a definite temperature or to the prevention of

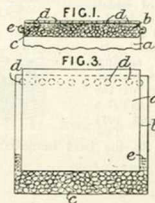


overheating in kettles, boilers, sterilizers, ovens, incubators, or the rooms of buildings. In the case of a kettle, the two upper temperatures are

slightly below and slightly above the boiling-point of water.

2360. Raetzer, H. J. Feb. 15.

Heating by chemical action.—Relates to cans for preserved food combined with heating-means in the form of a receptacle for lime or like reagent provided with perforations for the admission of water or other reacting-liquid. The receptacle *b* is formed separately from the can *a* to which it is secured by a band or otherwise, and a layer of cotton-wool or other absorbent material *e* is disposed between the lime *c* or the like and the perforations *d*. The receptacle *b* may form the cover of the can as shown in Fig. 1, or may be attached to the bottom of the can, or may form a jacket around the can as shown in Fig. 3. To heat the contents, the can is stood in water or other reacting-liquid with the perforations *d* submerged.

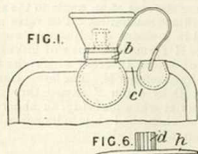


2538. Hurley, E. J. Feb. 17. *Drawings to Specification.*

Thermostats.—An internal-combustion engine vaporizer heated by water or steam comprises a thermostat placed in the heated chamber and consisting of a cylinder in which is fitted a plunger connected to valves controlling the flow of the heating medium. Movement of the plunger through variation of temperature is effected by mercury or other.

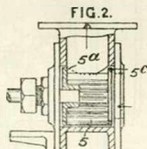
elliptical cross-section and provided with vertical and horizontal grooves to facilitate secure attachment to the flexible neck of the bottle.

2753. Brown, T. T. Feb. 20.



Hot-water bottles.—The sockets for screw stoppers of hot-water bottles are provided with long radial extensions to prevent rotation. Radial extensions *h*, Fig. 6, are provided on a screw socket *d* and extend beyond the flexible neck *b*, Fig. 1, of a hot-water bottle and are embedded in the space between the inner and outer linings of the bottle. The socket *d*, Fig. 6, may be of circular, hexagonal, or

2900. Kite, C. F., and Skelt, M. H. Feb. 23.

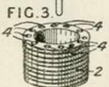


Heating buildings.—Relates to a pump for circulating liquid in a system of pipes. A centrifugal impeller *5* is arranged in a casing forming an angular junction piece or elbow in the piping in such a way that the passage for the liquid is not obstructed. The apparatus may be used in conjunction with that described in Specification 6813/11.

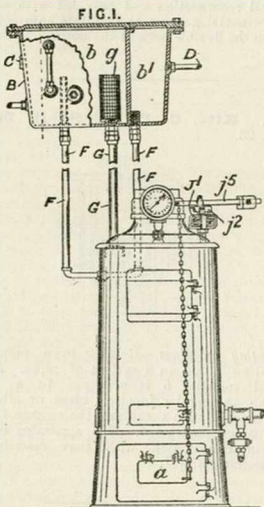
3034. Hall, I Feb. 25. [Addition to 19,573/14.]

Thermostats.—Instead of making the index and

stop described in the parent Specification adjustable, they are permanently fixed relatively to the head of the valve-control member, and the whole head is made angularly adjustable relatively to the valve seating. The valve seating 2 is provided with a number of holes 4, into any pair of which the pins 3 on the head 1 may be inserted in order to adjust the head relatively to the seating. The index 5 is marked upon the surface of the head and reads against a scale on the fixed part of the apparatus. The stop 6 is fixed to the head immediately below the index.



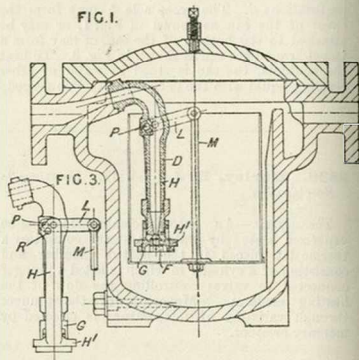
3059. **Hodges, F. J.** Feb. 25.



Heating buildings.—In a hot-water circulation system, the distributing-tank B is closed by a steam-tight cover and divided into two compartments *b*, *b'*, the compartment *b'* being open to the atmo-

sphere through a water-escape pipe D and connected to the main compartment *b* by a U-pipe F. A cage *g* containing stone, granite, &c. is provided at the top of the flow-pipe G to deaden the sound made by the steam and water entering the tank. Valves C allow steam accumulating in the tank to escape at a predetermined pressure. The air supply to the boiler furnace is regulated by an expanding and contracting chamber J' open to the boiler pressure. The movements of the chamber rock a short lever j' carrying a weighted lever j'' connected to the ash-pit door *a* by a chain.

3617. **Lancaster & Tonge, and Butterworth, J.** March 6.

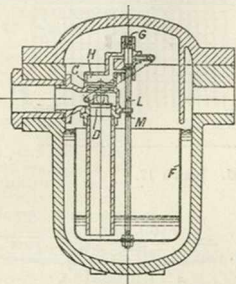


Steam-traps.—A steam-trap of the type described in Specification 9707/95, in which a floating bucket is coupled to a valve through lever mechanism, is arranged with the joint between the casing and the part carrying the seat at an angle to the axis of the trap to facilitate machining. The valve member F is mounted in a sleeve G adjustably secured in a bridle-piece H' formed on a pair of links H pivoted to a pair of levers L, from which the bucket is suspended by a member M. The levers L are pivoted to the part D by a pin P passed through a hole H in the link H when placed in an abnormal position, so that when the link is in its normal position, the pin cannot be withdrawn.

3642. **Gibson, W. B.** March 8.

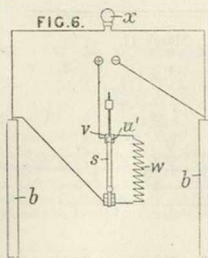
Steam-traps.—A steam-trap, of the type in which the main discharge valve is actuated by fluid pressure under the control of a float-actuated auxiliary valve, comprises a main valve D connected

to a piston C working in a cylinder H. The supply and exhaust of pressure fluid to and from the cylinder H is controlled by a balanced piston valve



G coupled to a bucket-shaped float F. The auxiliary-valve spindle works through a guide adapted to arrest stops L, M on the spindle.

3847. Forbes, Sir C. S. March 10.

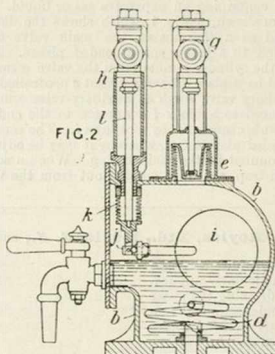


Thermostats.—In an electrically heated incubator, a device for controlling the temperature comprises a thermostat *s* of ordinary construction, mounted in the lid of the apparatus, and carrying contacts *u'*, *v*, through which the current supplied to the heating-coils *b* normally passes. When the temperature rises sufficiently for the thermostat to separate the contacts, the current flows through a resistance *w* which was previously short-circuited, and by the consequent diminution in the current, the heating effect is reduced.

3874. Hall, I. March 11. [*Cognate Application*, 8922/15.]

Thermostats.—In order to withstand high temperatures or the action of molten metals such as aluminium, the stem, or a protective tube surrounding the stem, of a thermostatic regulator such as described in Specification 21,072/12 is cast from iron having a low percentage of phosphorus, say about 0.25 per cent, this being just sufficient to produce fluidity for casting. The composition may consist of 75 per cent of haematite or Bessemer pig containing not more than about 0.05 per cent of phosphorus, and 25 per cent of Scotch or other foundry pig containing from 0.7 to 1 per cent of phosphorus

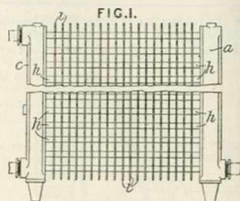
4001. Unit Engineering Co., and Mather, C. March 13.



Thermostats.—A valve device, for regulating the supply of cold water and heating-fluid to a water-heater of the type described in Specification 15,215/10, [*Class 64 (iii), Surface apparatus &c.*], is fitted to a chamber in which the heated water collects and is so arranged that the level of the water regulates the inflow of cold water, while the pressure above the water regulates the supply of heating-medium. The water-supply valve *h* is actuated by a float *i* acting on a lever *j* turning on pivots fixed to the sides of the chamber *b* and pinned to the valve spindle *l*. Leakage past the valve spindle is prevented by a bellows packing-device *k*. The steam valve *g*, preferably an equilibrium valve, is actuated by a bellows *e* connected to the spindle *e*. The steam, on its way to the heater proper, passes through a coil *d* in the collecting-chamber. The valves may be arranged within the chamber *b*. According to the Provisional Specification, a diaphragm or Bourdon tube may be used in place of the bellows and the regulator may be fitted to other types of heater.

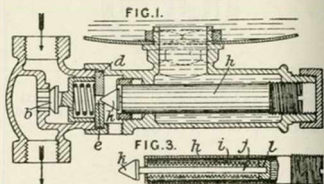
4154. Pease, E. L. March 16. [Cognate Application, 8432/15.]

Radiators.—In a radiator suitable for heating buildings, vertical metal strips *i*, each extending the full height of the radiator, are threaded on a vertical series of horizontal tubes *h* connected to side headers *a, c* so as to form a number of vertical air passages open at the sides and top. The strips may be alternately of different widths, or strips of the same width may be arranged in staggered order.



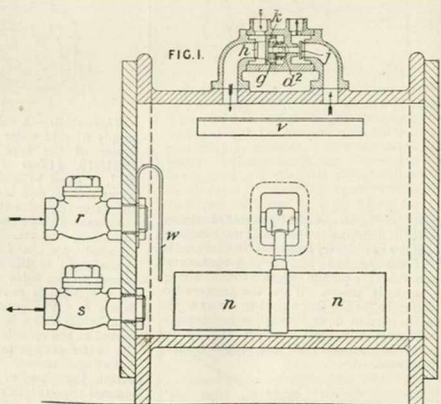
4190. Royles, Ltd., Royle, J. J., and Royle, G. E. March 17.

Steam-traps; thermostats.—A thermostatically-controlled valve device adapted for use as a thermostat or steam-trap, and of the type actuated by fluid pressure under the control of an auxiliary valve, has the auxiliary valve actuated by a sealed capsule containing an expansive gas or liquid. In the form shown in Fig. 1, which shows the device arranged as a thermostat, the main valve *b* is connected to a leaky spring-loaded piston. The end of the cylinder remote from the valve member is closed by a plate *d* having a vent *e* controlled by an auxiliary valve *k*. The auxiliary-valve spindle *j* is secured to a block *l* connected to the end of the capsule chamber *h* by a bellows *i*. The capsule is threaded at one end, whereby it may be adjustably mounted in the main casing. When used as a steam-trap, the fluid passing out from the valve acts on the capsule.

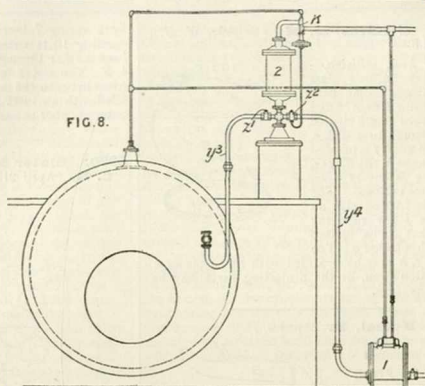


4191. Royles, Ltd., Royle, J. J., and Royle, G. E. March 17.

Steam-traps.—A steam-trap, particularly applicable for draining the water of condensation from apparatus working under a vacuum and for returning such water to a steam-generator, and of the type emptied by admitting live steam to the trap, has the steam inlet and exhaust valves actuated by a piston operated by fluid pressure under the control of a float-actuated auxiliary valve. The water drains into the trap through a non-return valve *r* and past a guard *w*, and ultimately raises a float *n*. The float lever is fitted with adjustable tappets adapted to actuate a plug cock on a pipe connected to the chamber *d'*, to connect this chamber to the interior of the trap or to atmosphere. When connected to atmosphere, the



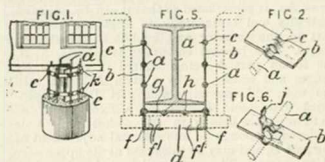
steam pressure acting on the leaky piston or diaphragm *g* opens the steam-inlet valve *h* against the action of a spring *k*, and closes the exhaust valve *j*, thus permitting steam to flow past the guard *v* and force the water out through the non-return valve *s*. In a modification, the inlet and exhaust valves are formed on separate spindles, and a lift valve is employed instead of a plug cock. The trap may be used in combination with a second trap for returning water from a low-pressure source to a high-pressure boiler. This arrangement is shown in Fig. 8, in which the low-level trap 1 discharges into the upper trap through a pipe *y*¹ and non-return valve *z*¹, and from which the water subsequently flows, by gravity, into the boiler through a pipe *y*³ and non-return valve *z*³. The trap 2 is fitted with a two-way valve *K* actuated by a diaphragm acted on by the pressure in the pipe *y*¹ or lower trap 1, so that when the lower trap is under pressure, the upper one is connected to atmosphere, and vice-versa. In cases where the



low pressure is sufficient to raise the water to a level above the boiler, the upper trap is dispensed with, and the trap 1 is arranged above the boiler. According to the Provisional Specification, a snifting valve may be used in place of the exhaust valve, or a second piston may be used to actuate the exhaust valve.

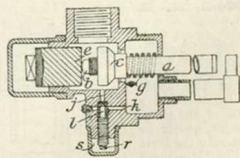
4756. Kerr, W. E., and Murphy, W. H.,
 [trading as "K. M." Concrete Steel Co.].
 March 26.

Fireproof coverings.—A concrete covering is bonded around metal girders and columns by means of parallel bars *a*, Figs. 1 and 5, and transverse bands *b*, *k* which are slitted and pressed to form eyes *c*, Fig. 2, or tongues *j*, Fig. 6. The bars *a* and the eyes may be round, square, or other shape. Soffit bars *h* may be carried on recessed cross-bars *g*.



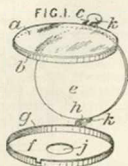
4824. Low, A. M. March 29.

Thermostats.—A thermostat of the type actuated by an expanding rod is fitted with a manually adjustable by-pass valve. The valve *c* is normally held open by a spring, but is closed, when the temperature is sufficiently high, by an expanding rod *b* which bears against an adjustable abutment *e* and against the end of a tube *a* secured to the valve member *c*. The by-pass *j*, *k* is controlled by a valve *l* actuated by a screw *r*, the squared end of which is protected by a cap *s*.

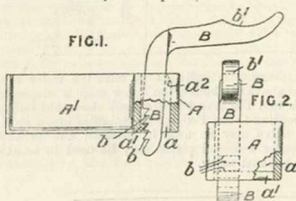


5324. Griffiths, R. M., [Griffiths, W. H.]
April 8.

Solar heat, utilizing.—A pocket burning glass for utilizing solar heat comprises a lens *a* fitted in a flanged ring *b* pivoted by a tongue *c* to a disk *e*, to which a disk *f* is pivoted by a tongue *h*, the disks *e*, *f* serving as covers when the device is closed. The disk *f* is formed with an aperture *j* for receiving the object to be ignited and with a flange *g*. The tongues *c*, *h* may be provided with finger-pieces *k* for manipulation, or the projecting parts may be formed as rings.



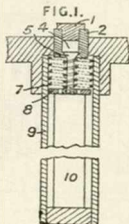
5329. Hutsel, R. April 9,



Radiators.—A bracket for supporting radiators, pipes, &c., is constructed so that it can be adjusted vertically and horizontally to engage a suitable part of the radiator and hold it at the desired height. The bracket comprises two parts, A, B, the socket part A being secured in position by flanges and screws, or by a stem A' built into the wall, and the adjustable part B being provided with teeth *b* engaging a fixed tooth or teeth *a*. The hole *a* in the socket part A is made wide enough to allow lateral adjustment of the part B, and may be thickened at its upper edge *a*² as shown. The seating *b*' may be shaped to receive a strap-like portion to form with it a complete collar to embrace a pipe.

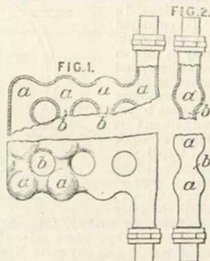
5969. Moul, H. E.
April 21.

Thermostats.—A thermostat, of the type actuated by the relative expansion of two solids connected together at one end, has one of the members made of quartz or fused silica. In the form shown in FIG. 1, the inner member 10, formed either of a rod or tube of quartz, is held against the closed end of an outer iron tube 9



by a spring 7 bearing against a washer 8. The member 10 is connected to the regulating-valve (not shown) through a lost-motion connexion 1, 2, 4, 5. The outer tube may be perforated, or the space between the inner and outer member may be filled with an inert liquid. In a modification, the outer member is made of quartz.

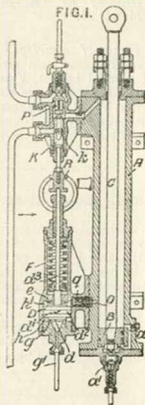
5990. Slater & Co., J., and Allensby, C. R. April 21.



Radiators.—Consists of an open-work panel or grid composed of a series of hollow bulbs *a* connected by tubular fillets *b*, the whole being electrically deposited in one piece.

7694. Gripaios, D. May 22.

Thermostats.—In apparatus for automatically regulating the draught in a boiler furnace in accordance with variations of steam pressure in the boiler, of the kind in which, upon the boiler pressure reaching a predetermined amount, steam is admitted to a cylinder and operates a piston connected to a damper, the supply of steam to and exhaust from the cylinder is controlled by valves which are actuated by a piston valve exposed to boiler pressure and adapted to be moved thereby against the action of a spring or weight, when the pressure rises above a predetermined amount, in such a manner as to effect the closing of the damper, the spring or weight together with steam pressure serving to return the piston valve

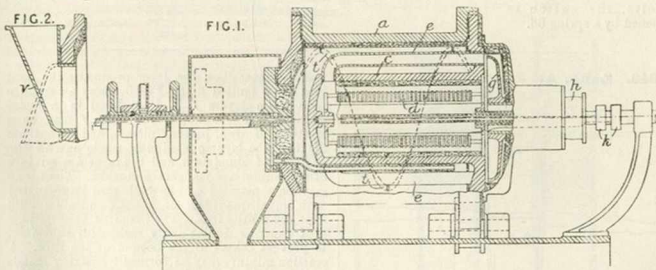




when the boiler pressure falls and so actuate the steam and exhaust valves as to allow the opening of the damper by a weight or spring. As shown in Fig. 1, the piston valve D is held against an annular seat *g* by a spring F, an annular space *h* being left around the seat while the portion *d* of the valve face surrounded by the valve face *g* is exposed to boiler pressure through the pipe *g*. When the boiler pressure rises above a predetermined amount, the valve D lifts against the spring F, the full area of the lower face of the valve is exposed to steam pressure, and the valve is forced against the seat *e*. Simultaneously, the spindle *d*² of the valve D and the exhaust valve K are lifted, the exhaust valve K also serving to lift the steam-inlet valve P off its seat when the exhaust ports *k* in the valve K have been closed to admit steam to the cylinder A and force down the piston B, which is connected to the damper by the rod C. Upon a fall of boiler pressure, the valve D moves down, and with it the valve K, which allows the valve P to close before the exhaust ports *k* are opened to permit the piston to rise and the damper to close under the action of a weight or spring. Steam is admitted to the annular space *h*¹ above the valve D

to assist the spring F in returning the valve to its normal position in either of two ways. Preferably, steam is allowed to pass from the annular space *h*, when the valve has been lifted from its seat, through a slot or gap *d*¹ in the piston ring *d*². When this method is adopted, a passage *o* provided with a valve *q* normally pressed open by a spring, allows for the escape of water of condensation from the space *h*¹ to the cylinder A. The valve *q* is closed when steam is admitted to the space *h*¹. An alternative method of admitting steam to the space *h*¹ when the valve D is raised consists in providing a passage such as *o* which admits steam to the space *h*¹ from the cylinder A when the piston B has been moved downwards sufficiently to uncover the passage *q*. A port *a* is provided in the bottom of the cylinder to allow for the passage of steam from the upper to the under side of the piston for cushioning purposes. A drain valve *a*¹ in the bottom of the cylinder is normally held open by a spring but closes when steam passes to the under side of the piston. The valves K, P may be operated by a forked hand-lever adapted to engage with the collar R on the spindle of the valve K.

7742. Barthelmess, E. May 25, 1914, [Convention date]. Void. [Published under Section 91 of the Act.]



Heating systems and apparatus.—Constant temperatures for metallurgical or other chemical processes are obtained by bringing the charge in a well-lagged chamber into contact with a large surface behind which a current of gas is circulated rapidly in a closed circuit containing a heater. The process can be carried out on a large scale, and is applicable to the roasting of red lead or barium peroxide. Appropriate gases, such as oxygen, can be supplied to the charge at high or low pressures. The chamber containing the charge may also contain the heater and a fan for the temperature-maintaining gas, or the heater and pump may be separate therefrom. In Fig. 1 is shown a horizontal cylinder *a* with a refractory lining; into this projects a cup-shaped chamber *c*, similarly lined, containing a heater *d* and having external longitudi-

nal pipes *e*, through which the heated air is circulated by a fan *g* at the end, driven by a pulley *h*. These pipes *e* are in contact with the charge. An electric resistance heater *d* is shown, the supply wires for which extend from contact rings *k* on the fan spindle at one end. At the other end may be axial passages for the supply and removal of gases for the reaction. A funnel-shaped spout *e* Fig. 2, which can be turned upwards for charging and downwards for discharging, may be provided, or the furnace may be rotated upon driven rollers, and be provided internally with a helical rib *t* for advancing the charge. In a modification, the charge in a stationary chamber is traversed by gas passages extending between headers which are connected through a pump to a worm in a combustion furnace.

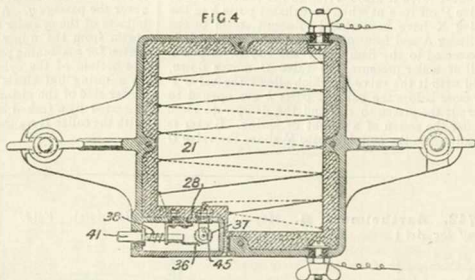
MacFarland, H. B., and Jay, R. May 29.

Non-conducting coverings for heat and sound; fire-proof coverings.—Seaweed, such as eel grass (*Rostera Marina*), is boiled in a two per cent solution of caustic soda for 1-6 hours, either at atmospheric or under steam pressure, and the fibrous residue is washed and removed. Part of this residue is immersed in acid, preferably dilute sulphuric, for 5-15 minutes, which removes mineral and other matter and converts the cellulose into hydrocellulose. The soluble substances are washed

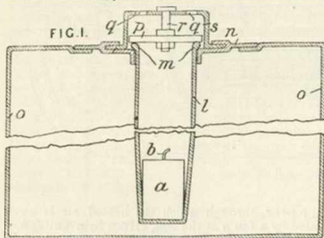
out, leaving a somewhat fibrous and gelatinous mass. 30-50 per cent of this material is mixed with 70-50 per cent of the fibrous material which has been treated with the alkali only, or, alternatively, is mixed with raw seaweed. The mixture is made by agitating in water, and the resulting material may be rolled into sheets. The material may be used as a heat insulator, or, after suitable treatment for fire-proofing, waterproofing, or sound-deadening.

8524. Dennis, O. C. June 9.

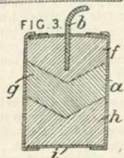
Thermostats for electric vulcanizers.—The heating-surface forms one wall of a partitioned case in one compartment of which is a thermal device for automatically controlling a heater in the other compartment. The circuit is closed by pressing a button 41 to bring a slotted spring 36 into engagement with a ratchet-wheel 37, which is fixed in its post by a plug 45 of soft solder; when this melts, the switch is opened by a spring 38.



8642. Lang, A. June 11.



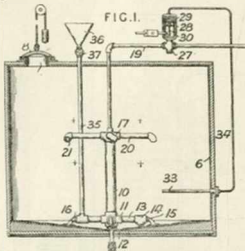
Heating by chemical action.—A heating-cartridge adapted to be ignited in a tube inserted in the substance to be heated comprises reaction mixtures disposed in layers of different reactive intensities. The layers are arranged to become ignited in the order of their



reactive intensities, the layer producing the least heat being ignited first. Fig. 3 shows a cartridge with three layers *f*, *g*, *h* enclosed in a metal casing *a*. For example, the layer *f* may be a mixture of iron, barium nitrate, and manganese dioxide, the layer *g* a similar mixture with the addition of aluminium, and the layer *h* a mixture of aluminium and manganese dioxide. The fuze *b* may be a nitrated cotton-wool cord impregnated with equal quantities of sulphur and aluminium dust and a little iron. The base *i* of the cartridge is of paper or similar easily carbonized substance, to prevent caking to the bottom of the tube. A reaction mixture may be formed by mixing metals or metalloids with bodies yielding oxygen or sulphur and with mineral fibrous material, such as glass-wool, slag-wool, or fibrous asbestos, the product being impregnated with a liquid combustible. For example, a mixture of iron powder, zinc dust, aluminium powder, and sulphur, or a mixture of manganese and potassium chlorate may form the reacting-constituent of the mass. The tube *l* which receives the cartridge is formed with an enlarged upper edge *m* resting on the edge of a hole in the cover *o* of the receptacle containing the substance to be heated. A lid *p* seated on the enlargement *m* is adapted to be raised by the pressure of escaping gases, which then pass through openings *q* in a cap *s* fitted to the cover *o* by a bayonet-joint. The lid *p* is guided by a bolt *r* sliding through the cap *s*.

8687. Craig, T. J. I., and Whipp Bros. & Tod. June 12.

Fire-proof coverings.—Porous bodies are fire-proofed by incorporating therewith at some stage during their manufacture the double carbonate of alumina and alkali.

9395. Dicker, S. G. S., [Reuter Process Co.] July 26.

Thermostats.—In heating and agitating apparatus, particularly applicable for treating fats and oils in the manufacture of soap, and for carrying out the process described in Specification 10,199/13, [Class 91, Oils &c.], the steam supply to the circulating-apparatus in the saponification tank 5 is regulated by a valve 27 controlled by a regulator 28 comprising a metal bellows 29 which is connected by a small pipe 34 to a tube 33 in the tank, and by a weighted stem 30 to the valve 27. The tube 33 contains any suitable volatile fluid which expands as the temperature within the tank increases and operates the bellows 29.

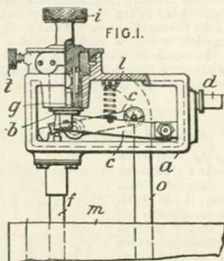
9637. Schweizerisches Serum & Impfstitut Bern. July 13, 1914, [Convention date].

Heating by chemical action.—Aqueous formalin for disinfecting purposes is vaporized by allowing the heat evolved by the hydration of a dehydrated salt, such as dehydrated copper sulphate, to start the decomposition of potassium chlorate which develops sufficient heat to start the vaporization. The constituents, including the aqueous formalin, are merely mixed all together, with the optional addition of manganese dioxide and pulverized metallic iron to act as a catalyst and to prevent oxidation respectively.

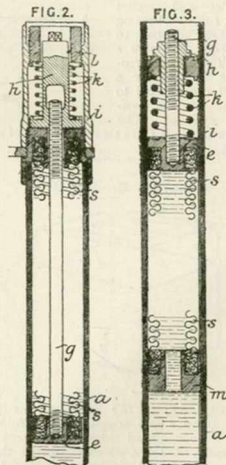
9650. Hall, I. July 2.

Thermostats.—Relates to apparatus of the type in which a thermostatic element of carbon or other non-metallic material actuates a controlling valve through levers or other amplifying means without the use of stuffing-boxes. Such an apparatus is applied to the control of a supply of non-combustible heating fluid, such as steam, hot-water, &c., through the chamber *a* containing the levers &c. *c*. The heating fluid enters the chamber by a

pipe *d*, passes through the valve *b*, and is either delivered by a pipe *o* into the liquid to be heated in the vessel *m*, or is passed through a coil immersed in such liquid. The thermostatic device *f* comprises



preferably an outer tube of steel and an inner rod of carbon or other non-metallic material. A spring *l* is provided to hold the valve normally closed. The valve seating *g* is adjustable from a knob *i* to allow of the setting of the apparatus for various temperatures, and is locked in position by a set-screw *t*.

10,734. Samson-Apparate-Bau Ges. July 23, 1914, [Convention date].

Thermostats; steam-traps.—Relates to devices in which an expansible fluid operates a valve in a

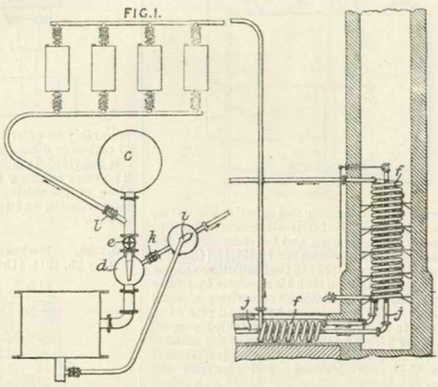


thermostatic apparatus or a steam-trap, and in which a piston with a corrugated flexible packing tube acts as a buffer against further expansion after the valve has closed. An additional spring *k*, bearing against the casing of the apparatus, is provided to take the strain of such further expansion in conjunction with the packing tube *s* of the piston *e*. In one construction, Fig. 2, the rod *g* of the piston *e* is screw-threaded to engage an adjusting-nut *h*, and the spring *k* is disposed between the nut

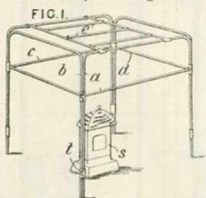
and a screw-cap *i* or a threaded sleeve *l* adjustable therein. In a modification, the spring *k* is disposed within the tube *s* between the piston *e* and a sleeve bearing against a screw plug adjustable in the cap *i*. In another modification, Fig. 3, the tube *s* is arranged below the piston *e*, its lower end being secured to a plug *m* screwed into the casing *a*. The plug is bored to allow the liquid to enter the tube *s* and to act on the piston *e*.

11,018. Bouhon, L. J. R. July 20.

Heating by circulation of fluids.—In a system for utilizing exhaust steam by heating it in coils placed in a chimney or flue and then passing it through heating-apparatus connected to the condenser, the steam first enters an expansion chamber, from which it passes either through the heating system or direct to the condenser. The expansion chamber *d* is connected directly to the condenser *c* through a valve *e* normally closed by the condenser vacuum. The inlet and outlet valves *k, l* of the heating system are adapted to close when the valve *e* opens. The steam circulation is assisted by a steam jet *i* connected to the inlet of the low-pressure cylinder. The steam-heating coils *f* are cleaned by jets of steam or air from perforated pipes *j* placed inside or outside the coils.



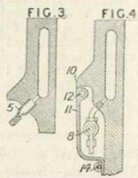
11,545. Osborne, E. Aug. 10.

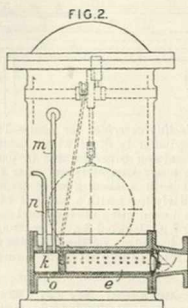


Heating apparatus arranged for placing round a stove *s* and adapted to be folded up, consists of four hinged sides *a . . d* secured by clasps *t*, and a flat top *e*, which is smaller than the rectangle enclosed by the sides and is hinged to the top of one side and supported on the opposite side. The knees &c. are placed beneath a rug covering the device.

12,047. Peyton, J. L., and Hitt, S. E. Aug. 22, 1914, [Convention date].

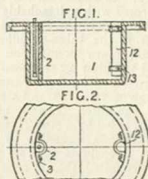
Non-conducting coverings for heat.—Moulds for casting ingots have a vacuum chamber round the upper portion, sufficient thickness of metal being provided above, outside, and below to afford such a rate of conduction as will prevent overheating of the inner wall. The chamber may be sealed by a closed pipe 5, Fig. 3 or by a valve 8, Fig. 4, protected by a hood 10 and shield 11, pivoted at 12 and locked by a rod 14 passed through lugs and bent over at the ends. When in place, the shield prevents accidental opening of the valve.



12,349. Baker, J., and Bakers, Ltd.
Aug. 27.

Steam-traps.—Relates to traps for draining oil-separators, condensers, turbine casings, or other chambers which are continuously under vacuum or alternately under vacuum and pressure, of the kind wherein the discharge valve is operated by a float through a tumbler lever, and wherein the trap is placed in communication with the chamber so as to balance the pressure in the trap when the discharge valve is closed, the communication being closed and air admitted to the trap when the discharge valve is open. The rotary sleeve discharge valve *e* is formed at one end with a chamber *k*, which places

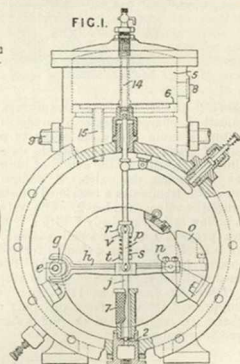
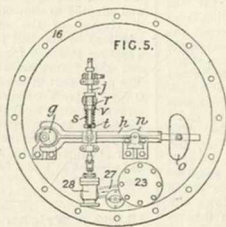
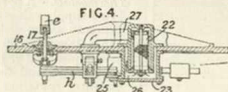
the trap alternately in communication with the chamber being drained and with the atmosphere respectively, through pipes *m*, *n* opening into the trap and the chamber, and through the pipe *m* and an aperture *o* in the valve casing.

12,597. Hall, I. Sept. 2.

Thermostats.—A pocket to receive the stem of a thermostat or thermometer used to regulate or indicate the temperature of molten metal or other liquid is in communication with the liquid receptacle and is directly attached to and in contact with its upright wall. The D-shaped pocket 1 is secured to the inner surface of the receptacle 2 by screws or rivets in flanges 3 on the pocket. The pocket may consist of a tube 12 fixed to the receptacle by bands 13. In a modification, the pocket is secured to the outer surface of the receptacle. The pocket may be made of the metal described in Specification 3874/15.

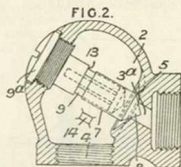
12,635. Gander, J. S. Sept. 2. [Cognate Application, 14,223/15]

Steam-traps.—Relates to apparatus for separating fluids of different specific gravities, of the float-actuated steam-trap type and in which the lever and link mechanism between the float and the valve is counterweighted, and consists in connecting the mechanism to the valve spindle through a spring, in order to prevent damage to the mechanism in case of jamming or incorrect adjustment. A cam *g* on the float shaft *e* engages the forked end of a lever *h* pivoted at *n* and fitted with a counterweight *o*. Links *p* connect the lever *h* to a member *r* sliding on the valve spindle *j*, and the spring *s* is disposed between a collar *t* fixed to the spindle and a



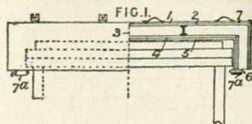
washer *e* engaging a tapered portion of the spindle. The mixture of fluids enters at 8 into a chamber 5 at the top of the container and passes through a filtering-disk 6 and a pipe 15 into the container. A hollow plug 14 in communication with the space below the disk 6 is fitted at its upper end with a cock for expulsion of air on starting. A second filter 7 is placed over the valve outlet 2 for the heavier fluid. The lighter fluid is discharged through outlets 9. In a modification, Figs. 4 and 5, the shaft *e* is formed with a detachable end portion 17 mounted in bearings in the cover 16 of the container, the lever *h*, the valve spindle *j*, and the associated mechanism are mounted on the outside of the cover, and the filter 22 is accessible from the outside of the cover. The fluid passes from the container through a valve 25 and a passage 26 to the interior of the filter 22, and, after passing through the filter, is led by a pipe 27 to the outlet valve 28. The filter is accessible by removing a cover 23. When three fluids, such as gas, oil, and water, are to be separated, the air cock at the top of the plug 14 is connected by a pipe to a second similar apparatus placed in inverted position above the first apparatus. The gas is thereby discharged at the top of the second apparatus, and the oil at the outlets 9 of the first apparatus. In a modified arrangement, the gas-discharging apparatus is fed by a pipe from the top of a tank containing the mixed fluids, the water-discharging apparatus is fed from the bottom of the same tank, and oil is drawn off directly from the tank.

12,790. Jones, T. Sept. 7.



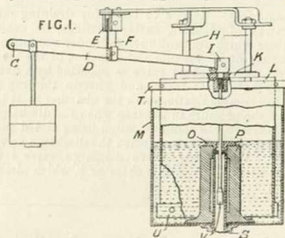
Steam-traps.—Relates to steam-traps for the automatic discharge of water of condensation from radiators wherein the valve opens to permit the escape of water but closes towards its seat again against the pressure by the action of blowing steam when it reaches the valve. A conically-formed valve seat 5 terminates a restricted passage 3^a leading into the valve chamber 2. The valve consists of a hollow cylindrical body 7 with a conical end 8 which projects into the small passage 3^a. The valve is freely guided on a stem 9 formed on, and supported by, a screwed plug 9^a. The stem is formed with flat surfaces and with a stop-shoulder 13. Horns or projections 14 at each side of the casing prevent the valve from dropping down the discharge passage 4 when the guide-stem 9 is removed for repairs.

12,905. Brown, H. E. Sept. 9.



Non-conducting coverings for heat.—The end of an engine cylinder is fitted with a readily removable heat-retaining cover formed in one or more parts. The cover comprises an outer sheet 1 of metal lined with a sheet 2 of asbestos, an inner sheet 5 similarly lined with a sheet 4 of asbestos, spacing-ribs 3 connecting the inner and outer sheets, and a filling 7 of slagwool &c. The flange is protected by a bent-over portion 6 of the cover, and the cover is retained in position by spring clips 7^a.

13,248. Jackson, W. J. Mellersh.,
[Ware Coupling and Nipple Co.]. Sept. 16.

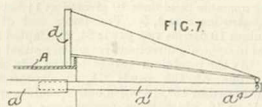


Thermostats.—A device for actuating the dampers and fuel-supply valves of a boiler especially adapted to generate steam under a pressure of 1-2½ oz. for use in a low-pressure steam-heating system comprises a liquid sealed bell coupled to the dampers through levers and chains. The bell *L* is guided in an outer container *M* by a band *U* riveted to the bell, and by a casting *K* secured to the bell and adapted to slide on pillars *H* secured to a cover *T* riveted to the outer container. Steam is admitted to the bell through a pipe *S* arranged in a casting *P* which forms a jacket around the pipe and also forms an overflow for the liquid seal. The upper part of the casting *P* carries a valve seat *O* for a valve *V* universally jointed to the bell and arranged nearly to shut off the steam supply when the bell is at the upper limit of its travel. The damper chains are connected at *C* to a weighted lever *D* supported by a link *F* from a member *E* and pivoted at *I* to a forked member secured to the top of the bell.

13,460. Wright, S., Waller, W., and
Roberts, G. Sept. 22.

Heating systems and apparatus.—A chamber *A*, for heating goods in glass dishes or tins, is provided

with telescopic rails a, a^1 on which carriers are suspended and along which they travel when they are inserted in, or withdrawn from, the chamber.

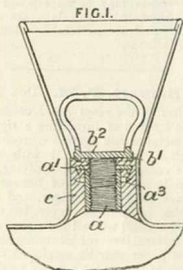


The outer rails are connected by a cross-bar a^4 and may be suspended from a beam by chains, or from a pillar or post d on the chamber.

14,007. Brokaw, W. G. Oct. 2. *Drawings to Specification.*

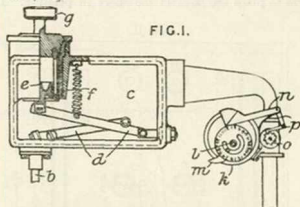
Hot-water bottles.—An inflatable life-saving collar may be used as a hot-water bottle, the water being introduced through the inflating-tube. The collar is enclosed in a cover closed at the rear edge by a flap having snap-fasteners.

14,279. Rowe, T. Oct. 8.



Hot-water bags.—An india-rubber hot-water bottle, water bed, or the like, of the type having a screw-threaded stopper adapted to engage a threaded ferrule embedded in the neck of the bottle, has the neck of the bottle built up above the ferrule to form a seat for the stopper. In the form shown, the ferrule a , which has projections a^1 as described in Specification 28,744/13, has a flange a^3 also provided with projections, and the neck c of the bottle is continued above this flange to form a seat b^1 for the stopper b^2 . In a modification, the part of the neck above the flange is formed from a separate piece of rubber. The flange on the ferrule may be dispensed with.

14,996. Hall, I. Oct. 23. [*Cognate Application* 4910/16.]



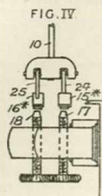
Thermostats.—In apparatus for maintaining a predetermined temperature for a predetermined time, the supply of combustible or other heating fluid is controlled by a thermostat comprising members with different coefficients of expansion. The invention is particularly applicable to cooking-stoves and to vulcanizing-presses using heated pressure plates or dies. The heating-fluid passes through two valves, one of which is controlled by clock-work k , while the other valve e , disposed in a fluid-tight box c , is controlled through levers d from a thermostat comprising an outer tube b of metal and an inner rod of carbon or other non-metallic material. The seat f of the valve e is adjustable from a knob g . The clock-work k has a rotating spindle l carrying a projection m adapted to operate a lever n to actuate a ratchet o on the valve spindle through levers p , thus turning on or off the supply of heating-fluid.

17,214. Mackenzie, J. W. [*Marsden, M. W.*] Dec. 7.

Fire-proof coverings.—A fire- and water-proof material for defences or barriers for powder magazines, coast fortifications, &c. is made of mineral wool and asbestos mixed together and highly compressed. Fire-proofed fibres of vegetable origin, such as those derived from bagasse, may be added. The material in cube or other form may be enclosed in a fire- and water-proof wrapper.

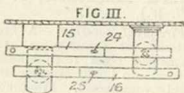
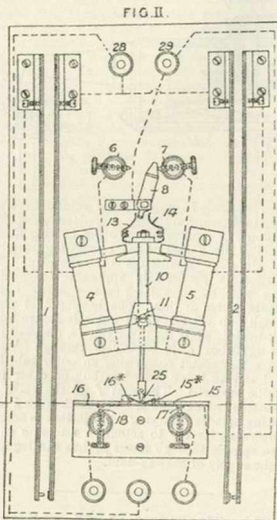
17,325. St. John, E. C. Dec. 10.

Thermostats.—Relates to apparatus for the automatic control of temperature in which thermostatic elements control the circuits through two electromagnets, completion of the circuit through either electro-magnet serving to actuate an unstable pendulum, which switches the heat on or off and also places contact members in position for completion of the circuit through the



other electro-magnet as soon as the temperature has again risen or fallen beyond the normal. The pendulum is arranged to move a separate pivoted arm to place the contact members in position. In

with the thermostat 1 and an electro-magnet 4 through a contact 6 and a pivoted arm 8, and is similarly in circuit with the thermostat 2 and an electro-magnet 5 through a contact 7 and the arm 8, which is actuated by spring arms 13, 14 secured to the unstable pendulum 10 pivoted at 11 between the electro-magnets 4, 5. The lower end of the pendulum 10 carries two pawls 24, 25 adapted to be moved in opposite directions from the normal position. As the pendulum swings to one side or the other, one of the pawls 24, 25 depresses an inclined portion 15*, 16* of a corresponding spring strip 15 or 16, which thereupon engages a contact 17 or 18 and completes a circuit which switches on or off the source of heat. Instead of two pairs of bimetallic strips, a single thermostat with three such strips, or any other thermostatic elements such as of the mercury-in-glass type, may be employed.



one arrangement, Fig. II, two thermostats 1, 2, each comprising two bimetallic strips, are employed, the contacts of thermostat 1 closing when the temperature falls, and those of thermostat 2 closing when the temperature rises. A battery connected across the terminals 28, 29 is in circuit

17,949. Cuthbertson, J. Dec. 28.

Non-conducting coverings for heat.—A heat insulating material is manufactured by immersing corrugated paper, formed into tubes or slabs of the desired thickness, in a mixture comprising two-thirds by bulk of a solution of silicate of soda and one-third of graphite, and removing and drying the product. Sheets or lengths of ordinary corrugated paper may be used, with or without non corrugated paper applied to one or both sides; one or more sheets may be rolled into a tube, or a number of sheets may be superposed to form a slab. The dried tubes or slabs are cut to the desired shape and are preferably wholly or partly covered with canvas.

18,047. Stewart, F. M. Dec. 28.

Non-conducting coverings for heat and sound.—Relates to a method of insulating a rigid piece of metal or a metal article against corrosion and electrolytic action by coating it with a layer of bituminous composition and applying, while the composition is soft, a layer of fibrous insulating material such as asbestos paper, and consists in applying the bituminous layer to the cleaned surface of the metal while the latter is in heated condition. Several layers of bituminous composition and asbestos paper may be employed and the exposed surface of the asbestos paper may be painted or otherwise waterproofed.

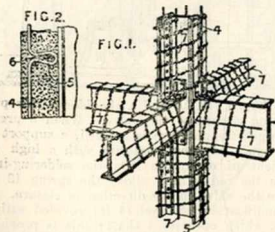
Reference has been directed by the Comptroller to Specification 27,101/11, [Class 73, Labels &c.].

APPENDIX.

The following abridgments should be inserted in place in the present volume.

A.D. 1909.

- 13,446. **Skinner, T. H., and Oneida Community, Ltd.** June 8.



Fire-proof coverings.—Metal columns and

beams are covered with concrete which is reinforced by means of chains wound helically and spaced by looped wires 4. The chains are passed through the loops 5 and are gripped therein by closing the loops by means of rings 6; the loops may be bent to lie in different planes. The chains are tightened by twisting them, and are held taut by threading a rod 7 through the links.

- 15,137. **Walters, A.** June 29. *Drawings to Specification.*

Thermostats.—An egg incubator is heated by an electric incandescent lamp, the current being automatically controlled by a contact thermometer placed near the eggs, and connected in circuit with an electromagnet which acts on a switch. A second lamp of less heating capacity may be provided, the circuit through which is closed when the main lamp circuit is opened.

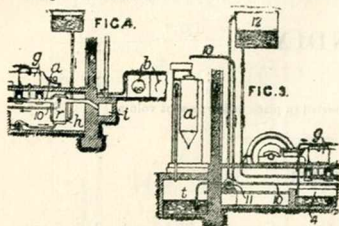
A.D. 1910.

2650. **Kihn, N., and Eisenhütten-Aktien-Verein Düdelingen.** Feb. 2.

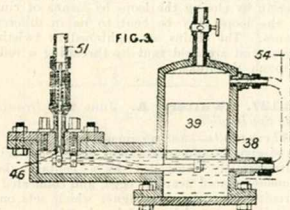
Heating systems and apparatus.—Water is heated by the exhaust gases from gas-engines in a tubulous boiler provided with a water-casing, and by passing it through the cooling-jackets of the engine cylinders. A purifier is placed in the circuit of the water, preferably

between the tubes and the water-casing of the boiler. In the system shown in Figs. 3 and 4, the water passes first through the casing *h* of the boiler *r*, and then is conducted through the pipe 10 to the purifier *a*, from which it passes through the tank *t*, the pump 11, and the tank 12, to the cylinder-jackets *g*, and, after collecting in a reservoir 4, is pumped through the tubes of the boiler. It is then led to the steam-

generators *b* or elsewhere. The exhaust gases pass to the boiler through the pipe *d*, and escape into the flue *i*.



9591. Gaucher, E. April 20. [Addition to 2658/07, Class 8, Air and gases, Compressing &c.]

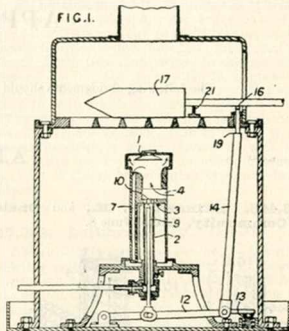


Steam-traps.—An oil-collecting chamber with a needle-valve 46 controlled by a float 39 is used in connexion with an air-pump of the kind described in the parent Specification adapted for simultaneous compression and exhaustion. The discharge pipe 51 has a non-return valve and communicates with the air-chamber of the pump.

16,234. St. Amant, G. S. July 7.

Thermostats.—An oil-store for heating soldering-irons &c. is provided with means whereby, when the utensil is placed in position, the oil supply is turned full on, and when the temperature of the utensil exceeds a predetermined limit, it is reduced, the regulation being effected by a vapour valve, the stem of which extends rearwardly therefrom through the vaporizer. In one arrangement, Fig. 1, the valve 9, which

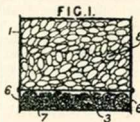
normally partially closes the vapour outlet 10, is opened when the soldering-iron 17 is placed in position by a rod 14 and lever 12, which act in opposition to a spring 13. On the rod 14 are



a T-shaped end 16 and a shoulder 19 for preventing closure of the valve. When a predetermined temperature is reached, a support 21 of copper or other material with a high coefficient of expansion lifts the soldering-iron from the rod 14 and allows the spring 13 to move the valve in the direction of closure. In a modification, the rod 14 is provided with a worm which operates a shaft; this is provided with a worm engaging a wheel which is internally screw-threaded to receive the lower end of the valve 9.

24,270. Casagrande, A. Oct. 19. No Patent granted (Sealing fee not paid).

Heating by chemical action.—A tin 1 is provided with a partition 3, rolled into the outer casing, so as to form a compartment 8 for food and a lower one containing quicklime 7. Water is introduced through openings 6 to start the heating action.

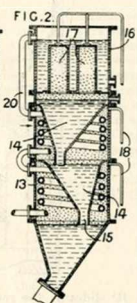
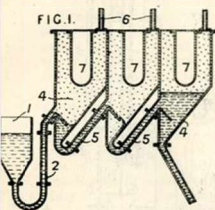


Reference has been directed by the Comptroller to Specification 12,763/04.



A.D. 1911.

1832. Liese, H. M. Jan. 26, 1910, [Convention date].

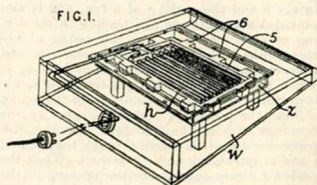


Heating systems and apparatus.—In apparatus for utilizing the heat of waste hot liquids for heating liquids, gases, or vapours, in order to avoid incrustation of the heat-exchanger by matter precipitated from the waste liquid, steam is generated from the liquid by reducing the pressure, and the heat-exchanging surfaces are arranged in contact with the steam. The apparatus shown in Fig. 1 consists of three evaporating-chambers 4 containing heat-exchangers 7 and having conical bottoms, which are connected by U-shaped pipes 5. Pipes 6 connect each chamber to the apparatus for reducing the pressure. The liquid is fed from a vessel 1, which is connected to the first chamber by a U-shaped pipe 2. In the modification shown in Fig. 2, the evaporating-chambers 13 are superposed in the form of a column. The conical bottom 14 of a chamber projects into the chamber below it and ends in a tube 15, which dips into the liquid in the lower chamber. The steam collects in the upper part of each chamber and in projections 17 on the top chamber. The projections 17 are enclosed in a tank 16 to which the liquid &c. to be heated is fed. A pipe 20 conveys the liquid &c. from the tank into coils in the evaporating-chambers. Pipes 18 connect the chambers to the apparatus for reducing the pressure.

9636. Cross, W., [Martiny, G. L.]: April 20.

Non-conducting coverings for heat.—A heat-insulating material composed of slag-wool, with or without the addition of organic or mineral fibres, is manufactured by suspending the fibrous material in water by agitation without the addition of adhesives, pouring the mixture into a mould having a filtering bottom, and drying the solid layer deposited. By moistening the material produced, it can be bent to any desired shape. Suitable proportions are 80-95 per cent by weight of slag-wool, with 20-5 per cent of organic or mineral fibres.

10,767. Frosali, L., and Visconti, L. May 3.

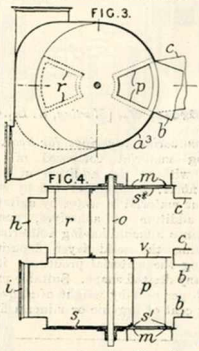


Foot-warmers.—A foot-warmer consists of a resistance h enclosed in a box z of thick metal, such as iron or steel, which is mounted in the upper surface of a support w of wood or other non-conductor of heat. The resistance may be iron wire of flat, round or rectangular cross-section, coiled or otherwise, and is laid in parallel grooves in a porcelain insulator 5, which is positioned by lugs 6 in the metal box. The ends of the resistance are led to contact terminals through porcelain tubes.

16,299. Marlow, T. G., and Pulsometer Engineering Co. July 14.

Heating systems and apparatus.—In apparatus for drying, heating, or cooling materials by means of air, or other fluid, the air in the required condition is supplied to the operating chamber or chambers and compressed

there, circulated under pressure in a closed cycle, exhausted, and circulated in a state of rarefaction in a closed cycle, in order to come into intimate and effective contact with the

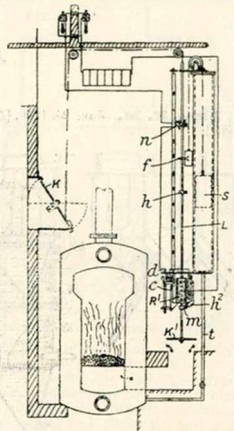


materials under treatment. Figs. 3 and 4 show an arrangement of valves suitable for this purpose. A casing a^2 is connected with the intake b and the outlet c of a fan, and is also provided with passages h, i leading to the drying or other chamber. In the casing a^2 are three disks v, s, s' on a rotary shaft o , and between the disks are arranged pockets p, r . When the valve is in the position shown, air is drawn in through an opening m in the casing a^2 , and the pocket p , and is delivered by the openings v, h to the chamber. As the disk passes on, the air is drawn through the opening i and is circulated under pressure. When the pocket r comes opposite to the opening c , the air in the chamber is rarefied, and when the pocket r has passed on, the air is circulated in a state of rarefaction. An arrangement is described which, in addition to the above operations, reverses the direction of motion of the air in the chamber. By controlling the motion of the shaft o appropriately, any stage of the operations may be practically eliminated.

17,802. Martini, C. H. Aug. 4.

Thermostats.—In connexion with a boiler for central heating, the admission of air to the furnace is under the joint control of the temperature in the rooms to be heated and of the boiler pressure. The valve K^1 controlling the furnace air supply is carried by a rod L , on which are mounted three adjustable tappets m ,

h, n . An arm f adapted to engage either of the tappets h or n is carried by a balance weight connected to a float S moving in a tank having a connexion t with the boiler. A weight



R^1 slides on the rod L , but is normally held up by a hook c controlled by an electro-magnet d in series with the controlling thermometers in the rooms and with a normally closed switch on the tappet n . In operation, on a rise of boiler pressure to the predetermined maximum, the arm f engages the tappet h and closes the valve K^1 , while a fall of pressure to the predetermined minimum causes the opening of the valve by the engagement of the arm f and tappet n , the switch on the tappet n being at the same time opened. On the subsequent rise of the boiler pressure, the arm f drops the tappet n , allowing the switch thereon to re-close, and if then the controlling thermometer is at the predetermined maximum, the electro-magnet d is energized, the hook c withdrawn, and the weight R^1 thus allowed to drop and close the valve K^1 . The weight R^1 , in falling, opens the thermometer circuit by means of the switch h^2 , so restoring the hook c to its operative condition. On the subsequent fall of the boiler pressure, the arm f eventually engages the tappet n , and the float S opens the valve K^1 and again lifts the weight on to the hook c . The valve K^1 is connected to a valve K , which opens when the valve K^1 closes in order to admit cold air to the boiler room and accelerate the cooling of the furnace and boiler.

A.D. 1913.

18,759. Woodward, F. E. Aug. 18.

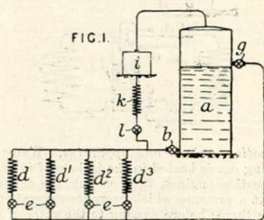
Fire-proof coverings.—A non-inflammable boot filling composition consists of a resinous gum such as "opaque," a resinous gum extracted from pontianac and like gums, resin, resin oil, pine tar, vaseline, a substance such as bicarbonate of soda which, when heated, gives off a non-inflammable gas, and a base of ground cork, sawdust, leather dust, &c. In an example, 16 lb. of resin is melted and into this are stirred 1 lb. of pine tar, 4 lb. of opaque, 4 lb. of resin oil, 8 lb. of vaseline, and 10 lb. of bicarbonate of soda, in the order named. Into every 5 gals. of this compound is stirred 25 lb. of the base material.

of steam except in the accumulator. The steam generated in the accumulator may be utilized in the engine *i* and returned to the circuit through the condenser *k* and the pump *l*. The

22,875. Semmler, C. Oct. 10.

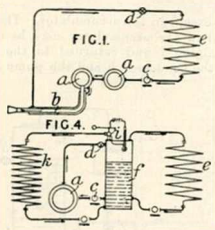
Heating systems and apparatus.—Waste heat from a number of variable sources, for example, in an iron works, from blast-furnace gas, slag, hot-blast stoves, puddling and welding furnaces, &c., is collected by a heat conveyer, so that a substantially uniform supply can be obtained for power and other purposes. In the apparatus illustrated diagrammatically in Fig. 1, the heat is collected by a liquid conveyer, such as distilled water, which is forced by a pump *b* through a circuit including an accumulator *a*, transfer apparatus *d, d', d'', d'''*, connected in parallel, and branch and main reducing-valves *e, e'* for preventing the formation

transfer apparatus in connexion with the various sources may be connected up either in series or in parallel, and in one form illustrated, a number of groups of branches in parallel are connected in the main circuit in series. In another form, two sets of transfer apparatus connected up in two separate circuits are provided for the different sources of heat, one circuit being at a higher temperature than the other. The heat collected may be utilized directly for the generation of vapour from a liquid of low boiling-point for use in suitable engines.



A.D. 1914.

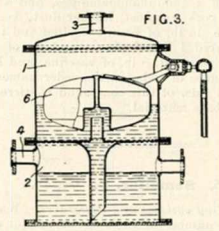
1491. Semmler, C. Jan. 20.



Heating systems and apparatus.—Water for heating &c. is heated in the jackets of internal-combustion engines, thus cooling the cylinders &c. at a pressure which prevents generation of steam there; before passing to the place of use, its pressure may be reduced either sufficiently to permit generation of steam for use in the heating-circuit or to a less extent. In the form shown in Fig. 1, a pump *c* forces the water into the jackets of the cylinders *a* and exhaust-pipe *b* of an internal-combustion engine. The water passes thence through a pressure-reducing valve *d* to the heating system *e* and thence returns to the pump *c*. In the arrangement shown in Fig. 4, an accumulating-vessel *f* is provided. The water is drawn by the pump *c* from, and returned from the heating system *e* to, the bottom of the vessel *f*, and passes from the valve *d* to, and to the system *e* from the top of the vessel *f*. In case the system *e* should

not be able to utilize all the heat supplied to the jacket of the vessel *a*, an auxiliary heat-dissipating system *k* is provided, to which the water passes by a valve *i*, which is opened automatically when the temperature or pressure in the vessel *f* becomes excessive.

14,041. Soc. E. Barbet et fils et Cie.
June 10, 1913, [Convention date].



Thermostats.—A steam-regulator for regulating the admission of steam to a distilling-column comprises chambers 1, 2, Fig. 3, connected in the manner illustrated, the steam supply being controlled by a float 6 in the chamber 1. Ports 3, 4 communicate with the upper and lower parts of the distilling-column so that the steam supply is regulated by the difference of the pressures at these points, as contrasted with the usual arrangement wherein the port 3 communicates with the atmosphere.

ABRIDGMENTS OF SPECIFICATIONS

(A.)—Illustrated Abridgments classified in 146 volumes for each of nine consecutive periods, dealing completely with all Specifications published from 1855 to 1908. The price of each volume is 2s. per period, including inland postage. Postage to Colonies and foreign Countries extra.

List of Periods.

1855-1866.

1867-1876.

1877-1883.

1884-1888.

1889-1892.

1893-1896.

1897-1900.

1901-1904.

1905-1908.

List of Classes.

1. Acids, alkalies, oxides, and salts, inorganic.
2. Acids and salts, Organic, and other carbon compounds, (including Dyes).
3. Advertising and displaying.
4. Aeronautics.
5. Agricultural appliances, Farnyard and like, (including the housing, feeding, and treatment of animals).
6. Agricultural appliances for the treatment of land and crops, (including Gardening-appliances).
7. Air and gas engines.
8. Air and gases, Compressing, exhausting, moving, and otherwise treating.
9. Ammunition, torpedoes, explosives, and pyrotechnics.
10. Animal-power engines and miscellaneous motors.
11. Artists' instruments and materials.
12. Bearings and lubricating apparatus.
13. Bells, gongs, foghorns, sirens, and whistles.
14. Beverages, (excepting Tea, coffee, cocoa, and like beverages).
15. Bleaching, dyeing, and washing textile materials, yarns, fabrics, and the like, (excepting Dyes).
16. Books, (including Cards and card cases and the like).
17. Boots and shoes.
18. Boxes and cases, (excepting Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wickerwork).
19. Brushing and sweeping.
20. Buildings and structures.
21. Casks and barrels.
22. Cements and like compositions.
23. Centrifugal drying, separating, and mixing machines and apparatus.
24. Chains, chain cables, shackles, and swivels.
25. Chimneys and flues, (including Ventilating-shaft tops).
26. Closets, urinals, baths, lavatories, and like sanitary appliances.
27. Coin-freed apparatus and the like.
28. Cooking and kitchen appliances, bread-making, and confectionery.
29. Cooling and ice-making, (including Refrigerators and ice-storing).
30. Cutlery.
31. Cutting, punching, and perforating paper, leather, and fabrics, (including the general treatment of paper after its manufacture).
32. Distilling, concentrating, evaporating, and condensing liquids, (excepting Steam-engine condensers).
33. Drains and sewers.
34. Dry-press.
35. Dynamo-electric generators and motors, (including Frictional and influence machines, magnets, and the like).
36. Electricity, Conducting and insulating.
37. Electricity, Measuring and testing.
38. Electricity, Regulating and distributing.
39. Electric lamps and furnaces.
40. Electric telegraphs and telephones.
41. Electrolysis, (including Electro-deposition and Electro-plating).
42. Fabrics, Dressing and finishing woven and manufacturing felted, (including Folding, Winding, Measuring, and Packing).
43. Fastenings, Dress, (including Jewellery).
44. Fastenings, Lock, latch, bolt, and other, (including Safes and strong-rooms).
45. Fencing, trellis, and wire netting.
46. Filtering and otherwise purifying liquids.
47. Fire, Extinction and prevention of.
48. Fish and fishing.
49. Food preparations and food-preserving.
50. Fuel, Manufacture of.
51. Furnaces and kilns, (including Blowpipes and blowpipe burners; Smith's forges and rivet hearths; and Smoke and fumes, Treating).
52. Furniture and upholstery.
53. Galvanic batteries.
54. Gas distribution.
55. Gas manufacture.
56. Glass.
57. Governors, Speed-regulating, for engines and machinery.
58. Grain and seeds, Treating, (including Flour and meal).
59. Grinding, crushing, pulverizing, and the like.
60. Grinding or abrading, and burnishing.
61. Hand tools and benches for the use of metal, wood, and stone workers.
62. Harness and saddlery.
63. Hats and other head coverings.
64. Heating, (excepting Furnaces and kilns; and Stoves, ranges, and fireplaces).
65. Hinges, hinge-joints, and door and gate furniture and accessories, (excepting Fastenings, Lock, latch, bolt, and other).
66. Hollow-ware, (including Buckets, Pans, Kettles, Sauce-pans, and Water-cans).
67. Horseshoes.
68. Hydraulic engineering.
69. Hydraulic machinery and apparatus, (excepting Pumps and other means for raising and forcing liquids).
70. India-rubber and gutta-percha, (including Plastic compositions and Materials of constructive utility, other than metals and stone).
71. Injectors and ejectors.
72. Iron and steel manufacture.
73. Labels, badges, coins, tokens, and tickets.
74. Lace-making, knitting, netting, braiding, and plaiting.
75. Lamps, candlesticks, gasoliers, and other illuminating-apparatus, (excepting Electric lamps).
76. Leather, (including Treatment of hides and skins).
77. Life-saving, (Marine), and swimming and bathing appliances.
78. Lifting, hauling, and loading, (including Lowering, winding, and unloading).
79. Locomotives and motor vehicles for road and rail, (including Portable and semi-portable engines).
80. Mechanism and mill gearing.
81. Medicine, surgery, and dentistry.
82. Metals and alloys, (excepting Iron and steel manufacture).
83. Metals, Cutting and working.
84. Milking, churning, and cheese-making.
85. Mining, quarrying, tunnelling, and well-sinking.
86. Mixing and agitating machines and appliances, (including Centrifugal machines and apparatus).
87. Moulding plastic and powdered substances, (including Bricks, building and paving blocks, and tiles, and Pottery).
88. Music and musical instruments.
89. Nails, rivets, bolts and nuts, screws, and like fastenings.
90. Non-metallic elements.
91. Oils, fats, lubricants, candles, and soaps.
92. Ordnance and machine guns.
93. Ornamenting.
94. Packing and baling goods.
95. Paints, colours, and varnishes.
96. Paper, pasteboard, and papier mâché.
97. Philosophical instruments, (including Optical, nautical, surveying, mathematical, and meteorological instruments).
98. Photography.
99. Pipes, tubes, and hose.
100. Printing, Letterpress and lithographic.
101. Printing other than letterpress or lithographic.
102. Pumps and other means for raising and forcing liquids, (excepting Rotary pumps).
103. Railway and tramway vehicles.
104. Railways and tramways.
105. Railway signals and communicating-apparatus.
106. Registering, indicating, measuring, and calculating, (excepting Signalling and indicating by signals).
107. Roads and ways.
108. Road vehicles.
109. Ropes and cords.
110. Rotary engines, pumps, blowers, exhausters, and meters.
111. Sewage, Treatment of, (including Manure).
112. Sewing and embroidering.
113. Ships, boats, and rafts, Div. I.
114. ————— Div. II.
115. ————— Div. III.
116. Shop, public-house, and warehouse fittings and accessories.
117. Sifting and separating.

LIST OF CLASSES

118. Signalling and indicating by signals, [excepting Railway signals and communicating-apparatus].
119. Small-arms.
120. Spinning, (including the preparation of fibrous materials and the doubling of yarns and threads).
121. Starch, gum, size, glue, and other stiffening and adhesive materials.
122. Steam engines, (including Details common to fluid-pressure engines generally).
123. Steam generators, (excepting Furnaces).
124. Stone, marble, and the like, Cutting and working.
125. Stopping and bottling, (including Bottles, jars, and like vessels).
126. Stoves, ranges, and fire-places.
127. Sugar.
128. Table articles and appliances.
129. Tea, coffee, cocoa, and like beverages.
130. Tobacco.
131. Toilet and hairdressing articles, and perfumery.
132. Toys, games, and exercises.
133. Trunks, portmanteaux, hand and like travelling bags, baskets, hampers, and other wickerwork.
134. Umbrellas, parasols, and walking-sticks.
135. Valves and cocks.
136. Velocipedes.
137. Ventilation.
138. Washing and cleaning clothes, domestic articles, and buildings.
139. Watches, clocks, and other timekeepers.
140. Waterproof and like fabrics.
141. Wearing-apparel.
142. Weaving and woven fabrics.
143. Weighing-apparatus.
144. Wheels for vehicles, [excepting wheels for Locomotives and tramway and traction engines; Railway and tramway vehicles; and Toys].
145. Wood and wood-working machinery.
146. Writing-instruments and stationery, and writing-accessories, (including Educational appliances).

(B.)—Abridgments classified in 271 volumes:—

1909-1915.
1916-1920.

(In course of Publication.)

NOTICE.—The price of each volume is 2s., including inland postage. Postage to Colonies and foreign Countries extra. These volumes can also be obtained sheet by sheet, as printed, by payment in advance of a subscription of 5s. for each volume, including inland postage, and 7s. 6d., including postage abroad. The sheets already printed can be seen in the Patent Office Library and in some of the principal provincial Libraries.

List of Classes.

- 1 (i), Chemical processes and apparatus.
1 (ii), Inorganic compounds other than metallic oxides, hydrates, oxyacids, and salts, (including Alkali manufacture and Cyanogen compounds).
1 (iii), Oxides, hydrates, oxyacids, and salts, Metallic, (other than Alkali manufacture and Cyanogen compounds).
2 (i), Acetylene.
2 (ii), Cellulose, Non-fibrous, and cellulose derivatives, (including Artificial filaments, sheets, and the like containing same).
2 (iii), Dyes and hydrocarbons and heterocyclic compounds and their substitution derivatives.
3 (i), Advertising and displaying apparatus, Moving and changing.
3 (ii), Advertising and displaying other than by moving and changing apparatus.
4, Aeronautics.
5 (i), Farmyard and like appliances, (other than Housing and feeding animals).
5 (ii), Housing and feeding animals, (other than Chaff and vegetable cutters).
6 (i), Cultivating implements and systems.
6 (ii), Gardening and like appliances, (including Miscellaneous agricultural appliances).
6 (iii), Harvesting appliances.
7 (i), Combustion-product, compressed-air, hot-air, and vacuum engines.
7 (ii), Internal-combustion engines, Arrangement and disposition of parts of, (including Construction of parts peculiar to internal-combustion engines).
7 (iii), Internal-combustion engines, Carburetting-apparatus, vaporizers, and heaters for.
7 (iv), Internal-combustion engines, Igniting in.
7 (v), Internal-combustion engines, Starting, stopping, and reversing.
7 (vi), Internal-combustion engines, Valves and valve-gear for, (including Other means and methods for regulating and controlling internal-combustion engines).
8 (i), Air and gases, Compressing, exhausting, and moving, (including Bellows and Vacuum and like dusting and cleaning apparatus).
8 (ii), Air and gases, Treating otherwise than by compressing, exhausting, and moving.
9 (i), Ammunition and ammunition receptacles.
9 (ii), Torpedoes, explosives, and pyrotechnics.
10, Animal-power engines and miscellaneous motors.
11, Artists' instruments and materials.
12 (i), Bearings and bearing-surfaces.
12 (ii), Lubricating passages, channels, reservoirs, and baths, and lubricating-oils.
12 (iii), Lubricators and lubricating bearing-surfaces, (other than Lubricating passages, channels, reservoirs, and baths).
13, Bells, gongs, foghorns, sirens, and whistles.
14 (i), Aerating liquids and gaseous, seltzogenes, and siphon bottles.
14 (ii), Beverages, malt products, and organized ferments, (other than Aerating beverages).
15 (i), Dyeing and otherwise treating textiles, textile materials, and the like with liquids and gases, Apparatus for, (including Bleaching and washing, Processes and materials for).
15 (ii), Dyeing, Processes and materials for.
16, Books, mercantile forms, and the like.
17 (i), Boots and shoes, Apparatus for making and repairing.
17 (ii), Boots and shoes, Construction of.
17 (iii), Boots and shoes, Protectors and trees and other accessories for.
18, Boxes and cases.
19, Brushing and sweeping.
20 (i), Buildings and structures, Kinds or types of.
20 (ii), Buildings and structures, Miscellaneous accessories and details applicable generally to.
20 (iii), Doors and windows and their accessories.
20 (iv), Floors, roofs, walls, and ceilings.
21, Casks and barrels.
22, Cements and like compositions.
23, Centrifugal machines and apparatus, (other than Centrifugal fans, pumps, and reels).
24, Chains, chain cables, shackles, and swivels.
25, Chimneys and flues, (including Ventilating-shaft tops).
26, Closets, urinals, baths, lavatories, and like sanitary appliances.
27, Cold-free apparatus and the like.
28 (i), Bread-making, confectionery, and cooking-appliances.
28 (ii), Kitchen and like appliances other than cooking-appliances.
29, Cooling and ice-making, (including Refrigerators and ice-storing).
30, Cutlery.
31 (i), Cutting and severing machines for paper, leather, fabrics, and the like.
31 (ii), Punching and perforating machines and hand tools for cutting, punching, perforating, and tearing paper, leather, fabrics, and the like.
32, Distilling, concentrating, evaporating, and condensing liquids.
33, Drains and sewers.
34 (i), Drying gases, clothes, and materials in long lengths.
34 (ii), Drying systems and apparatus, (other than Drying gases, clothes, and materials in long lengths).
35, Dynamo-electric generators and motors, (including Frictional and influence machines, magnets, and the like).
36, Electricity, Conducting and insulating.
37, Electricity, Measuring and testing, (including Electric resistances and inductances).
38 (i), Electric couplings, and cut-outs other than electro-magnetic and thermal.
38 (ii), Electric currents, Converting and transforming other than by rotary converters and rotary transformers, and condensers.
38 (iii), Electric motor control systems and motor and like controllers.
38 (iv), Electric supply and transmission systems and apparatus not otherwise provided for.
38 (v), Electric switches and electro-magnetic and thermal cut-outs, (other than Motor and like controllers).
39 (i), Electric lamps, Arc and incandescent-arc, and vacuum or low-pressure apparatus for electric discharges through gases or vapours.
39 (ii), Electric lamps, Incandescent.
39 (iii), Heating by electricity, (including Electric furnaces and ovens).
40 (i), Electric signalling systems and apparatus, (other than Telegraphs and Telephones).
40 (ii), Phonographs, gramophones, and like sound transmitting and reproducing instruments.
40 (iii), Telegraphs, Electric.
40 (iv), Telephones and telephone systems and apparatus, Electric.
40 (v), Wireless signalling and controlling.
41, Electrolysis, (including Electro-deposition and Electro-plateing).

LIST OF CLASSES

- 42 (i), Fabrics, Finishing and dressing.
42 (ii), Fabrics, Treating otherwise than by finishing and dressing.
43, Fastenings, Dress, (comprising Buckles, Buttons, Jewellery, and certain other fastenings specially applicable to wearing apparel).
44, Fastenings, Lock, latch, bolt, and other, (including Safes and strong-rooms).
45, Fencing, trellis, and wire netting.
46, Filtering and otherwise purifying liquids.
47 (i), Fire-escapes and fire and temperature alarms.
47 (ii), Fire-extinguishing and firepreventing and minimizing.
48, Fish and fishing.
49, Food preparations, food-preserving, and the like.
50, Fuel, Manufacture of.
51 (i), Furnaces and kilns, Combustion apparatus of, (including Details in connexion therewith).
51 (ii), Furnaces and kilns for applying and utilizing heat of combustion, (other than Combustion apparatus and details in connexion therewith).
52 (i), Furniture, Fittings and details applicable generally to and articles of furniture not otherwise provided for.
52 (ii), Furniture for sitting and lying upon.
52 (iii), Tables, desks, and leaf turners and holders.
52 (iv), Upholstery, wall furniture, screens, and looking-glasses.
52 (v), Window, stair, and like furniture, brackets, racks, and stands, (including Antimacassars and Table and like covers).
53, Galvanic batteries.
54, Gas distribution.
55 (i), Coking, gas-producers, and retorts.
55 (ii), Gas manufacture other than gas-producers and retorts.
56, Glass.
57, Governors, Speed-regulating, for engines and machinery.
58, Grain and seeds, Treating, (including Flour and meal).
59, Grinding, crushing, pulverizing, and the like.
60, Grinding or abrading, and burnishing.
61 (i), Hand-tool, brush, mop, and like handles.
61 (ii), Hand-tools, (other than Wrenches and bolt, nail, screw, and like inserting and extracting tools).
61 (iii), Wrenches and bolt, nail, screw, and like inserting and extracting tools.
62, Harness and saddlery.
63, Hats and other head coverings.
64 (i), Heating liquids and gases.
64 (ii), Heating systems and apparatus, (other than Heating liquids and gases and Surface apparatus for effecting transfer of heat).
64 (iii), Surface apparatus for effecting transfer of heat, (other than Apparatus in which the heat is transferred from products of combustion).
65 (i), Door and gate operating-appliances, furniture, and accessories, (other than Fastenings, Lock, latch, bolt, and other and Hinges and pivots).
65 (ii), Hinges and pivots.
66, Hollow-wire, (including Buckets, Pans, Kettles, Sauce-pans, and Water cans).
67, Horseshoes.
68 (i), Excavating earth and rock, beams, buoys, canals and rivers, ferries, and water supply.
68 (ii), Subaqueous buildings and structures, diving, and raising sunken ships and objects.
69 (i), Hydraulic apparatus not otherwise provided for.
69 (ii), Hydraulic presses, motors, motors, and like apparatus for use with high pressures.
69 (iii), Spray-producers and liquid-distributing sprinklers and nozzles.
70, India-rubber and gutta-percha, (including Plastic compositions and Materials of constructive utility, other than metals and stone).
71, Injectors and ejectors.
72, Iron and steel manufacture.
73, Labels, badges, coins, tokens and tickets.
74 (i), Braid and braiding-machines, crochet, lace, and lace-making, and net-making machines.
74 (ii), Knitting and knitted fabrics.
75 (i), Burners and burner fittings.
75 (ii), Lamp chimneys, globes, lenses, shades, reflectors, and smut-catchers, and holders therefor.
76 (iii), Lamps for lighting and heating, Details and accessories applicable generally to, (including Lighting burners, pipes, cigars, and the like).
76 (iv), Lamps for lighting and heating, Kinds or types of, (including Lighting Systems of).
76, Leather, (including Treatment of hides and skins).
77, Life-saving, (Marine), and swimming and bathing-appliances.
78 (i), Conveyors and elevators for dealing continuously with articles and materials in bulk.
78 (ii), Lifting, lowering, and hauling not otherwise provided for.
78 (iii), Lifts, hoists, and jacks.
78 (iv), Loading and unloading, (including Transporters and cranes).
78 (v), Winding and paying-out apparatus for lifting, lowering, and hauling, (including Pulley-blocks and the like).
79 (i), Locomotives and tramway, traction, portable, and semi-portable engines.
79 (ii), Motor vehicles, Arrangement and disposition of driving, transmission balance, and reversing gearing on.
79 (iii), Motor vehicles, Arrangement and disposition of parts of, not otherwise provided for, (including Construction of parts peculiar to motor vehicles).
79 (iv), Motor vehicles, Frames and undercarriage work of.
79 (v), Motor vehicles, Steering and controlling.
80 (i), Gearing, Belt, rope, chain, toothed, and friction, and gearing for converting and conveying rotary or reciprocating motion.
80 (ii), Gearing, Variable-speed, differential, and reversing and for stopping and starting, and shafting and its accessories.
80 (iii), Link-work, cams and tappets, and ratchet and screw-and-nut gearing.
80 (iv), Mechanism not otherwise provided for.
81 (i), Disinfecting and deodorizing, and medical and like preparations.
81 (ii), Medical, surgical, and dental appliances.
82 (i), Metals, Extracting and refining, and alloys.
82 (ii), Washing granular, powdered, and like materials, and amalgamating, cleaning, coating, and granulating metals.
83 (i), Casting and moulding metals.
83 (ii), Metal articles and forms, Combination apparatus and processes specially designed for producing and treating.
83 (iii), Metals, Cutting.
83 (iv), Metals, Working.
84, Milking, churning, and cheese-making.
85, Mining, quarrying, tunnelling, and well-sinking.
86, Mixing and agitating machines and appliances.
87 (i), Bricks, building and paving blocks, slabs, tiles, and pottery.
87 (ii), Moulding plastic and powdered substances, (including Casting substances other than metals and Presses, Mechanical).
88 (i), Musical instruments, Automatic.
88 (ii), Music and musical instruments other than automatic.
89 (i), Bolts, studs, nuts, washers, and rivets.
89 (ii), Hooks, nails, coppers, pins, staples, wedges, and wood-screws.
89 (iii), Nailing and stapling and wire-stitching.
90, Non-metallic elements.
91, Oils, fats, lubricants, candles, and soaps.
92 (i), Ordnance and machine-gun carriages and mountings.
92 (ii), Ordnance and machine guns.
93, Ornaments.
94 (i), Packing and wrapping-up for transit and storage, (including Baling).
94 (ii), Paper bags, sacks, wrappers, and the like, (including Making envelopes).
95, Paints, painting, and the like.
96, Paper, pasteboard, and papier mâché.
97 (i), Optical systems and apparatus.
97 (ii), Surveying, nautical, and astronomical instruments.
97 (iii), Thermometers, photometers, meteorological and mathematical instruments, and miscellaneous philosophical instruments.
98 (i), Photographic cameras and auxiliary appliances therefor.
98 (ii), Photographic processes and apparatus other than for taking photographs, (including Photographic plates, films, and papers).
99 (i), Pipes and tubes, Joints and couplings for, (including Joints for tubular framework and like Wire and rod couplings and joints).
99 (ii), Pipes, tubes, and hose, (other than Joints and couplings for).
100 (i), Feeding and delivering webs and sheets.
100 (ii), Printing processes and apparatus, (other than Type setting and composing).
100 (iii), Type making, setting, and composing, (including Type-bar making machines).
100 (iv), Typewriters and like machines.
102 (i), Pumps, Reciprocating, for liquids, (including Steam-engine air-pumps and Combined pumps for liquids and gases).
102 (ii), Water and other liquids and semi-liquids, Raising and forcing otherwise than by pumps.
103 (i), Brakes and retarding-apparatus.
103 (ii), Rail and road vehicles, Details applicable generally to.
103 (iii), Railway and tramway vehicles, Accessories for.
103 (iv), Railway and tramway vehicles, Body details and kinds or types of.
103 (v), Railway and tramway vehicles, Draught, coupling, and buffing appliances for.
103 (vi), Railway and tramway vehicles, Undercarriage and underframe details of.
104 (i), Railway and tramway crossings and points and switches.
104 (ii), Railway and tramway permanent way other than crossings and points and switches, and railway and tramway systems other than electric.
104 (iii), Railways and tramways, Electric, (including Electric traction).

LIST OF CLASSES

105. Railway signals and communicating-apparatus.
106 (i). Calculating, counting, and cash-registering apparatus.
106 (ii). Dynamometers, gauges, measures of length, steam-engine and like indicators, and testing-apparatus.
106 (iii). Fares and admission-fees checking, revolution and speed indicators, and odometers.
106 (iv). Indicating, recording, and registering apparatus not otherwise provided for.
106 (v). Measured quantities delivering, measures of capacity, and sampling liquids.
107. Roads and ways.
108 (i). Road vehicles, Body details and kinds or types of.
108 (ii). Road vehicles, Undercarriage details and draught appliances for.
108 (iii). Springs and vibration-dampers.
109. Ropes and cords.
110 (i). Centrifugal and screw fans and pumps.
110 (ii). Rotary engines, pumps, blowers, exhausters, and meters.
110 (iii). Turbines and reaction-wheels
111. Sewage, Treatment of, (including Manure).
112. Sewing and embroidering.
113 (i). Ship and boat fittings and accessories, and pontoons and rafts.
113 (ii). Ships and boats, Kinds or types and structural details of.
114. Ships, boats, and rafts, Propelling, steering, and manoeuvring.
115. Shirts, boats, and mats, Rigging, sails, and spars for, (including Boat raising, lowering, and disengaging gear).
116. Shop, public-house, and warehouse fittings and accessories.
117. Sifting and separating.
118 (i). Indicators and burglar and like alarms.
118 (ii). Signals, (including Marine signals).
119. Small-arms.
120 (i). Spinning, Preparation of fibrous materials for, (including Obtaining, opening, carding, and like treatment of fibres in general).
120 (ii). Spinning, twisting, and winding yarns and threads, (including Winding cords, wire, and the like).
120 (iii). Yarns and threads and miscellaneous spinning accessories and processes and treatment of fibres.
121. Starch, gum, size, glue, and other stiffening or adhesive materials.
122 (i). Engine and like cylinders, connecting-rods, cross-heads and guides, fly-wheels, piston-rods, and pistons.
122 (ii). Steam-engine distributing and expansion valves and valve-gear and valve-actuating arrangements therefor.
122 (iii). Steam-engines, Kinds or types of, and details not otherwise provided for, (including Steam and other fluid-pressure hammers and presses).
122 (iv). Steam-engines, Regulating or controlling, starting, stopping and reversing, (including Engine turning-gear).
122 (v). Stuffing-boxes and substitutes therefor, (including Packing therefor).
123 (i). Liquid-level regulating, indicating, and registering, incrustation and corrosion preventing and removing, and door lids and covers for resisting fluid pressure.
123 (ii). Steam-generators.
123 (iii). Steam separators and superheaters.
124. Stone, marble, and the like, Cutting and working.
125 (i). Bottles, jars, and like vessels, (including Non-refillable bottles, jars, and like vessels).
125 (ii). Bottles, jars, and like vessels, Filling, opening, and closing, (other than Stoppers, lids, covers, and capsules).
125 (iii). Stoppers, lids, covers, and capsules, Bottle, jar, and like.
126. Stoves, ranges, and fire-places.
127. Sugar.
128. Table articles and appliances.
129. Tea, coffee, cocoa, and like beverages.
130. Tobacco.
131. Toilet and hairdressing articles, and perfumery.
132 (i). Amusement and exercising apparatus other than games and toys.
132 (ii). Games.
132 (iii). Toys.
133. Trunks, portmanteaux, and like travelling bags, baskets, hampers, and other wickerwork.
134. Umbrellas, parasols, and walking-sticks.
135. Valves and cocks.
136 (i). Velocipede, cycle, and like vehicle brakes, steering-mechanism, and miscellaneous accessories.
136 (ii). Velocipede, cycle, and like vehicle driving-mechanism, (including Hand and foot driving-mechanism for apparatus other than vehicles).
136 (iii). Velocipedes, cycles, and like vehicles, Kinds or types and structural details of.
137. Ventilation.
138 (i). Washing and cleaning buildings and domestic articles other than clothes.
138 (ii). Washing, mangling and wringing, ironing, and starching clothes.
139. Watches, clocks, and other timekeepers.
140. Waterproof and like fabrics.
141. Weaving-apparatus.
142 (i). Looms, Driving, reversing, stopping, and starting, and loom shedding-mechanism and pattern cards, chains, surfaces, and the like.
142 (ii). Looms, Kinds or types of, and details not otherwise provided for.
142 (iii). Looms, Weft supplying, inserting, beating up, cutting, doubling, and twisting in.
142 (iv). Woven fabrics and articles, and warping, leasing, balling, and beaming yarns, (including Flee fabrics and Floor coverings).
143. Weighing-apparatus.
144 (i). Wheels for vehicles, (other than Wheel tyres, Pneumatic and other elastic, and rims for use therewith).
144 (ii). Wheel tyres, Pneumatic: and other elastic, and rims for use therewith.
145 (i). Wood, Cutting, (including Sawing).
145 (ii). Wood, Working, (including Sawing).
146 (i). Filing papers and documents.
146 (ii). Stationery, wafers and seals, educational appliances, and ciphers and codes.
146 (iii). Writing-instruments, ink, receptacles for writing-materials, pads, and blotters.

FIFTY YEARS SUBJECT INDEX, 1861-1910.

A subject index of all complete specifications for the period 1861-1910 has now been published in 271 volumes corresponding to the new series of Illustrated Abridgment Classes (List B above). The classification is in accordance with the "Abridgment Class and Index Key," as amended up to date. To some extent the headings in the "Fifty Years Subject Index" may be regarded merely as a compilation of the corresponding headings in the abridgment volumes, and, so far as this is the case, the Index may be used with the abridgments. But, generally speaking, the headings represent an improved and extended classification of matter, and it may often be found more convenient to use the "Fifty Years Subject Index" with the specifications, as the contents of the new index headings will not always be found collected in any one Abridgment Class.

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