PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 64 (ii)

HEATING SYSTEMS AND APPARATUS

[*other than* HEATING LIQUIDS AND GASES *and* SURFACE APPARATUS FOR EFFECTING TRANSFER OF HEAT]

PERIOD—A.D. 1909–15

LONDON:
PRINTED BY HIS MAJESTY'S STATIONERY OFFICE.
PUBLISHED AT THE PATENT OFFICE, 25, SOUTHAMPTON BUILDINGS,
CHANCERY LANE, LONDON, W.C.2.

1921

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EXPLANATORY NOTE

The contents of this Abridgment Class may be seen from its Subject-matter Index, which includes all index headings, subheadings, and subdivisions allotted to this Class, as well as cross-references under them, although there may be no cases affected within the period covered by this volume. For further information as to the classification of the subject-matter of inventions, reference should be made to the *Abridgment-Class and Index Key*, published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2.

It should be borne in mind that the abridgments are merely intended to serve as guides to the Specifications, which must themselves be consulted for the details of any particular invention. Printed Specifications, price 1*s.*, may be purchased at the Patent Office, or ordered by post, no additional charge being made for postage.

SUBJECT-MATTER INDEX

Abridgments are printed in the chronological order of the Specifications to which they refer, and this index quotes only the year and number of each Specification

(512) Wt. 32733—2778 500 5/21 H. St.

Heating buildings &c., Radiators for—*cont.*
other than those arranged in ceilings &c.—*cont.* 24,827. 27,314. 29,964. '*14.* 1364. 2366. 2489. 4653. 6090. 7695. 11,078. 12,375. 15,844. 16,531. 16,680. 20,022. 20,814. 21,526. 23,445. 23,493. '*15.* 60. 1826. 4154. 5329. 5990.

Heating buildings, ships, and vehicles, Systems for, (*including* Other like systems for heating by circulation of fluids).
Excepting Fire-extinguishing, (*systems modified for*), [*Class* **47** (ii)]; Heating by chemical action &c.; Heating by electricity, [*Class* **39** (iii)]; Motor-vehicles, Arrangement &c. not otherwise provided for, (*arrangement of apparatus on motor-vehicles in connexion with motor systems*), [*Class* **79** (iii)].
air and other gas. '*09.* 2503. '*10.* 6541. 16,530. 26,342. '*11.* 3337. 10,274. '*12.* 25,711. '*13.* 3. 10,799. 16,187. '*14.* 12,276. 14,293.
supplying warm air to rooms in ventilating. *See Class* **137**.
miscellaneous. [*No cases.*]
steam and vapour. '*09.* 1996. 3730. 3848. 7040. 7964. 10,161. 10,557. 13,325. 13,537. 17,202. 17,475. 17,724. '*10.* 7847. 15,524. 16,530. 18,572. 21,233. 24,573. 25,415. 26,342. 26,495. 27,243. '*11.* 2980. 3522. 3923. 8338. 9611. 11,618. 21,699. 28,963. '*12.* 6407. 8424. 15,163. 16,345. 16,697. 18,753. 23,263. 26,467. 30,109. '*13.* 10,590. 16,187. 18,729. 18,731. 18,826. '*14.* 3456. 3803. 12,276. 12,705. 14,181. 14,280. 17,860. 18,058. '*15.* 11,018.
wa er and other liquid. '*09.* 7830. 7964. 8556. 10,161. 13,537. 14,692. 30,523. '*10.* 1580. 1964. 3611. 5253. 16,530. 25,415. 26,342. 28,189. '*11.* 3890. 5542. 6813. 20,807. 27,694. 28,397. '*12.* 4072. 5818. 7987. 15,654. 16,345. 21,187. 22,594. 23,141. 23,987. 25,104. '*13.* 1108. 11,105. 13,336. 16,187. 16,925. 18,946. 20,081. 20,669. 22,525. 24,918. 28,942. 29,830. '*14.* 1307. 2366. 2681. 2708. 9233. 11,010. 12,276. 14,897. 15,679. 17,713. 22,372. 22,420. '*15.* 2900. 3059.

Heating by chemical action and molecular combination, other than combustion. '*10.* 24,270 [*Appx.*]. '*13.* 23,249. '*14.* 2998. 22,242. '*15.* 1745. 2360. 8642. 9637.
thermo-aluminic and like mixtures. *See Class* **82** (i).

Heating, Heat-storing apparatus for. '*09.* 5777. 6932. 20,639. 23,818. 30,089. '*10.* 4790. '*11.* 9794. 13,334. 18,676. 27,843. '*12.* 2143. 19,064. 21,854. '*13.* 26,907. '*14.* 2072. 4355.
Excepting Cold and heat retaining chambers &c., [*Class* **29**].

Heating systems and apparatus.
Excepting Bed warmers &c.; Burners and burner fittings, [*Class* **75** (i)]; Cauldrons, Asphalt, snow-melting, gravel-heating, and like, (*including* Plant for making tar macadam), [*Class* **107**]; Digesters, [*Class* **64** (i)]; Drying systems &c., [*Class* **34** (ii)]; Foot-warmers, Carriage &c.; Furnaces &c., [*Classes* **51** (i—ii)]; Heating air &c., [*Class* **64** (i)];

Heating systems and apparatus—*cont.*
Excepting—cont.
Heating and cooling appliances, Surgical &c., [*Class* **81** (ii)]; Heating buildings, ships, and vehicles, Radiators for; Heating buildings, ships, and vehicles, Systems for, (*including* Other like systems for heating by circulation of fluids); Heating by chemical action &c.; Heating by electricity, [*Class* **39** (iii)]; Heating, Heat-storing apparatus for; Heating water &c., [*Class* **64** (i)]; Heat, Utilizing solar and natural: Hot-water bottles &c.; Stoves &c., [*Class* **126**]; Surface-apparatus for effecting transfer of heat, [*Class* **64** (iii)]; Washing-boilers, set-pans, &c., [*Class* **64** (i)].
Heating systems and apparatus applicable solely in special operations, or to special structures, are indexed only under separate headings, such as Boots and shoes, (*heating-appliances forming part of*), [*Class* **17** (ii)]; Filtering &c., (*filters, heating*), [*Class* **46**]; Hatching and rearing appliances, [*Class* **5** (ii)].
bricks, blocks, slabs, and tiles for. *See Class* **87** (i).
chambers and ovens of general and unspecified application heated by circulation of hot fluids. '*11.* 16,299 [*Appx.*]. '*15.* 7742.
coverings and compositions, non-conductors of heat. *See* Non-conducting coverings &c.; Plastic compositions, [*Class* **70**].
fans. *See Class* **110** (i).
heat-retaining chambers with previously-heated bodies introduced to heat other contents. *See Class* **29**.
incrustation and corrosion, preventing, in pipes. *See Class* **123** (i).
making and treating apparatus by operations of interest apart from the product. *See separate headings, such as* Metals, Bending &c., [*Class* **83** (iv)].
miscellaneous—
heating granular materials. '*10.* 26,526.
utilizing heat of liquefaction of a compressed vapour. '*13.* 13,881.
pipe joints and couplings. *See Class* **99** (i).
plant, combined turbine-power and heating, regulating steam distribution in. *See Class* **110** (iii).
pumps for. *See Class* **102** (i).
steam-engines modified to supply steam for heating purposes. *See* Steam-engine and other fluid-pressure engine distributing and expansion valves &c., [*Class* **122** (ii)]; Steam-engines, Kinds &c., [*Class* **122** (iii)]; Steam-engines, Regulating &c., [*Class* **122** (iv)].
steam-generators. *See Class* **123** (ii).
steam-superheaters. *See Class* **123** (iii).
steam-traps. *See* Steam-traps.
thermostats. *See* Thermostats &c.
valves and cocks. *See Class* **135**.
waste-heat systems and arrangements of apparatus for heating liquids, (*other than* power and like systems in which the waste heat is normally used to reduce heat requirements of system from which heat is rejected). '*09.* 13,325. 13,537. '*10.* 2650 [*Appx.*]. '*11.* 1832 [*Appx.*]. '*13.* 22,875 [*Appx.*]. 29,830. '*14.* 1491 [*Appx.*]. 20,267.
feed-water, heating. *See Class* **64** (i).

NAME INDEX

The names in *italics* are those of persons by whom inventions have been communicated to the applicants for Letters Patent.

ERRATA

The following abridgments should be *deleted* :—

A.D. **1909.** Nos. 1224. 12,022. 14,548. 14,657. 19,696. 24,941
A.D. **1910.** No. 27,645.
A.D. **1911.** Nos. 11,317. 13,391. 13,494.
A.D. **1912.** Nos. 1355. 13,685.
A.D. **1913.** No. 23,906.
A.D. **1914.** No. 22,551.
A.D. **1915.** Nos 11,545. 13,460.

CLASS 64 (ii).

HEATING SYSTEMS AND APPARATUS,

[*other than* HEATING LIQUIDS AND GASES *and* SURFACE APPARATUS FOR EFFECTING TRANSFER OF HEAT].

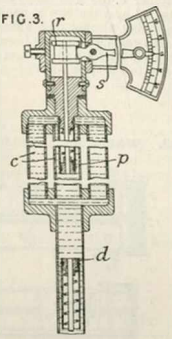
Patents have been granted in all cases, unless otherwise stated. Drawings accompany the Specification where the abridgment is illustrated and also where the words *Drawings to Specification* follow the date.

A.D. 1909.

210. Sandvoss, H. Jan. 4.

Thermostats.—In devices in which heat expansion of mercury or the like in a vessel or bundle of pipes *c* causes a piston *d* to be depressed to adjust a valve regulating steam supply &c. means are provided, such as a piston *p*, the position of which decides the amount of movement given to the lower piston *d*. The position of the piston *p* can be decided by means of an arm *s* engaging at one end with a collar *r* on the piston spindle and at the other with corrugations on a scale. An adjustable diaphragm may be used instead of the piston *p*.

FIG. 3.



529. Ogden, J. E. L. Jan. 8. [*Cognate Application*, 3148/09.]

FIG. 1.

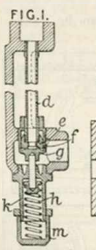
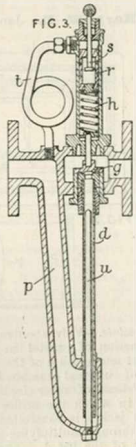


FIG. 3.



Steam-traps.—A steam-trap has a valve *g* provided with two seatings, of which one *e* is moved away from the valve by the contraction of a tube *d*, thereby allowing the pressure of water to act over the

whole surface of the valve, and force it from a stationary seat f; means are also described for compensating for the varying pressure of the steam, and for excessive expansion. In the form shown in Fig. 1, the movable seat e slides in a fixed sleeve f forming the stationary seat. The valve, which may be flat, conical, or grooved, is held in the closed position by a spring h, supported in a casing k by a cap m, which is screw-threaded for adjustment; it may however be balanced by steam pressure acting on a diaphragm supporting the valve, which in this case has a central passage. In the form shown in Fig. 3, a pipe t connects the steam pipe with the space above a piston r connected by a spring h with the valve. The expansion tube contains a rod u to reduce the quantity of liquid in the tube, and is supported by a compensating-tube p which neutralizes excessive expansion. This tube is not affected by the condensation water, as this collects mainly in the expansion tube. A rod s enables the valve to be operated by hand. A layer of liquid may lie above the piston to prevent the piston from being subjected to great temperature variations. In another modification, no spring is used, and the balancing-piston is fixed to the lower end of the rod u, the valve g being carried at the other end. According to the first Provisional Specification, a hollow valve may be balanced by steam pressure acting on a flexible sleeve fixed to the valve by a wedge-shaped ring, and to neutralize excessive expansion the tube d may be in contact with the framework. Specifications 286/04 and 23,829/05 are referred to.

599. Hart, W. E. Jan. 9.

FIG. 1.

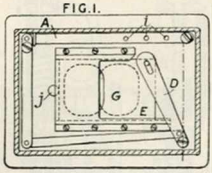
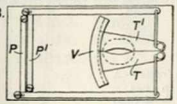


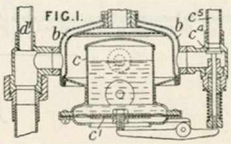
FIG. 3.



Thermostats.—Valves controlled by the expansion or contraction of a metal bar are used to maintain a constant temperature of the water in the cylinder jackets of internal-combustion engines having closed systems of water circulation. Fig. 1 shows a device in which the orifice G, forming the exit from the jacket, is controlled by a sliding plate E operated through multiplying-gear by the alteration in length of the bar A. The hot water from the jackets fills the chamber, and thereby raises the bar to the same temperature. The bar may be fixed to the casing at any of the points i, while a stop j limits the movement of the plate E and prevents it from completely closing the orifice. In a modified form, an additional arm from the lever D passes into a separate chamber and operates a second similar sliding valve situated in a by-pass on the delivery side of the circulating-pump and closes its orifice as the orifice G is opened. Fig. 3 shows a further modification in which the variation in length of two bars P, P¹ is transmitted to pivoted sectors T, T¹ sliding in a guide V and having a small permanent opening between them to permit the water to circulate when the engine is started.

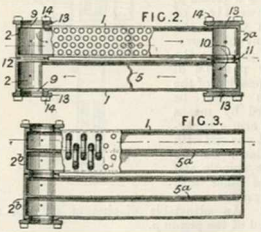
608. Maxim, Sir H. S. Jan. 9.

FIG. 1.



Thermostats.—Heating-water for an explosion engine carburettor is circulated in pipes c^5, d^1 and chamber b, the flow being controlled by a valve c^4 actuated by a thermostat consisting of a chamber c containing alcohol and water in the proportion of about twenty to one, the lower end of the chamber being closed by a diaphragm c^1 connected through a lever to the spring-loaded valve c^4.

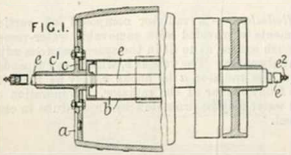
983. Warg, R. Jan. 14.



Radiators.—Relates to steam radiators of the type in which a hollow base is divided by a partition into two chambers communicating with each other by a series of looped pipes, and consists in

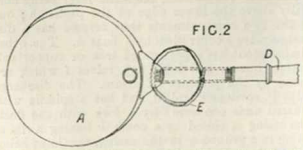
providing the hollow base with cylindrical transverse heads having single transverse openings on opposite sides of the partition for the inlet and outlet of the steam. Fig. 2 shows a sectional plan of one form of the radiator, in which the hollow base 1 is provided with the cylindrical heads 2, 2^a having the inlet and outlet openings 9, 10 on opposite sides of the partition 5. Two or more bases may be coupled together by plates 13 and bolts 14 as shown, metallic packing-rings 11 and distance-pieces 12 being interposed. If steam under pressure is carried in the radiator, the discharge end is closed and an air-vent valve is provided. In the modification shown in Fig. 3, each base 1 is provided with a longitudinal partition 5^a extending into the head 2^b instead of the transverse portion 5.

1224. Walker, G. T. Jan. 18.



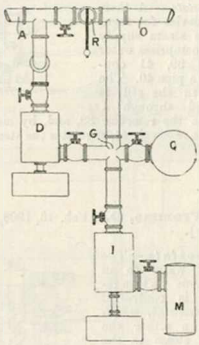
Heating-apparatus. — A tumbling or shaking barrel, for treating small metal articles, is constructed with an internal heater which is adaptable for use either with electric heating-elements or with steam or other heating-fluid. The barrel *a* is provided at either end with detachable centre-plates *c*, each extended to form a hollow spindle c^1, which is mounted in suitable bearings. A long, relatively stationary, tube *e* passes through these spindles and supports a cylindrical casing b^1, which contains electric heating-elements supplied with current by cables running along the tube *e* and connected to the terminals e^2. The tube *e* may be adapted for leading in steam or other heating-fluid to the chamber b^1. A similar device may be applied to open-topped or other inclined, or gyratory barrels.

1297. Child, W. Jan. 19. *No Patent granted (Sealing fee not paid).*



Bed-warmers.—A receptacle A constructed for hot water is provided with a strap E for carrying when the handle D is removed. The body part can be used as a foot-warmer.

1996. Boot, H. L. P. Jan. 27.



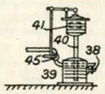
Heating by circulation of fluids.—In a combined power and heating system for distilleries, breweries, dye-works, &c., turbines are used for the production of power, and the exhaust steam passes to the heating system or to low-pressure turbines. The exhaust from a turbine D flows to a fitting G, and thence by a pipe O to the heating-system in which the steam may be allowed to mix with the liquid to be heated. Any excess of exhaust steam is either stored in a receiver Q or passed to a low-pressure turbine I and a condenser M. Steam is admitted by a reducing-valve R from the high-pressure main A to the low-pressure main O when there is a deficiency of exhaust steam.

2128. British Thomson-Houston Co., [*General Electric Co.*]. Jan. 28.

Non-conducting coverings for heat.—Insulating-materials, which are heat-refractory and of the type described in Specification 19,035/05, [*Class* 36, Electricity, Conducting &c.], are made in flexible sheets by mixing powdered silica with a hydrate and asbestos fibre, well agitating so as to felt the fibre and then forming sheets, which are treated so as to produce therein a hydrated silicate. As an example 260 lbs. of asbestos fibre may be mixed with 430 lbs. of calcium hydrate and 370 lbs. of silica; the mixture is treated in a beating-machine and then passed into a paper-machine. After passing through the agitator, it goes to the paper-machine and after drying is treated with steam at pressures of from 120 to 160 lbs. The resulting asbestos paper like substance may be cut into disks, washers, and the like.

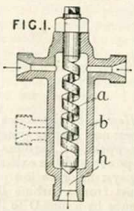
2400. Fontaine, C. C. Feb. 1.

Thermostats.—A thermostatic device for regulating the steam supply to a still comprises water reservoirs 39, 41 connected by a pipe 40. The pressure in the still is transmitted through a pipe 38 to the reservoir 39, and, by means of a float in the reservoir 41, regulates the steam-supply valve 45.



2488. Fromme, O. Feb. 13, 1908, [*Convention date*].

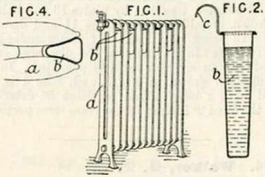
Thermostats.—The supply of water to an instantaneous steam-generator is controlled by a thermostat, which regulates either the supply of steam to the feed-pump or the stroke of the feed-pump, and the supply of liquid fuel to the furnace is controlled by a thermostat, the operation of which is adjustable by hand. Steam from the generator, on its way to the feed-pump, or to a pressure-device controlling the stroke of the pump or the fuel-supply valve passes through a casing *b* containing a thermostat *a*, which controls a by-pass passage *h* to the atmosphere or condenser. The thermostat is preferably made in the form of a helically-wound wire, and is cut out of a solid bar.



2503. Wood, W. O. Feb. 2. *Drawings to Specification.*

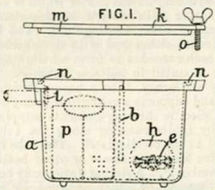
Heating vehicles.—Relates to the method of heating railway and other vehicles by compressed air in which the heating is effected by the heat of compression of the air, and consists in utilizing the same compressed air for actuating the brakes of the vehicle. The air, before passing to the brake main, may be additionally heated by passing it through a coil in the smoke-box of the locomotive. The compressor may be mounted on the locomotive and driven by an engine, or it may be driven by a strap from the axle of the carriage. Branch pipes from the brake main lead to heating-coils in each carriage, and are provided with control valves operated from the inside of each carriage. The air from the heating-coils passes to a return-pipe which may be the return main from the brake cylinders. In a modification, each carriage is provided with its own compressor, which supplies a reservoir from which the air passes to the heating-coils and the brakes.

2591. Teufel, W. J. Feb. 3, 1908, [*Convention date*].



Radiators.—A radiator composed of vertical elements is provided with removable water-vessels of such section as to fit in the spaces between adjacent elements. The vessels *b*, which are suspended from the radiator *a* by hooks *c*, may be fitted to the front or rear of the radiator. Evaporation of the water may be promoted by an air-tube in each vessel.

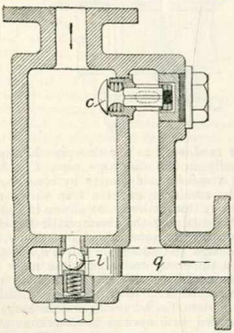
2679. Grant, C. de V., and **McDowall, Steven, & Co.** Feb. 4.



Steam-traps.—A trap for collecting grease, fat, or vegetable matter, and for discharging water from steam used in cooking-apparatus &c., has a casing *a* divided by a partition *b* extending from near the top to near the bottom, the water-level being normally above the lower edge of the partition; one of the two compartments thus formed has a discharge valve *e* controlled by a float *h*. The other compartment has a perforated iron or copper collecting-box *p*, and inlet flap valves *i* which are closed by the pressure of steam. The discharge valve is spring-controlled, and has a spindle with squared ends connected by a fork with the float. The casing is closed by a cover *k* having a rim *m* fitting in a groove *n* in the casing, the joint being packed steam-tight with rubber or asbestos. The cover may have a vacuum or other valve, and may be fitted to the casing by thumb-screws *o* or by a lever or clamp. The box is removable, or may

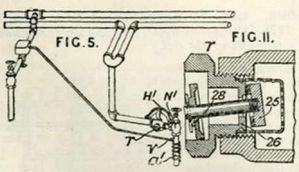
have an outlet provided with a cock for drawing off grease &c. The steam trap may be lifting or non-lifting according to the pressure of steam. According to the Provisional Specification, a blow-off valve and a draw-off cock may be provided.

2811. Wilcocks, W. J. R., Bourne, J. C., and **Tomlinson, W.** Feb. 5.

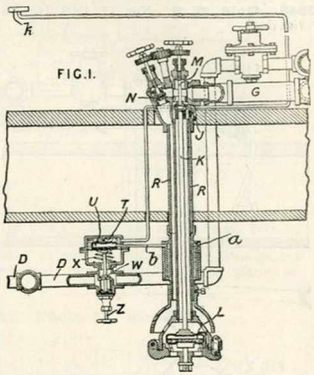


Steam-traps. — A reservoir placed between a steam-pipe and a steam-trap has a spring-pressed overflow valve *c*, which automatically closes, and a main discharge valve *l*, which automatically opens in consequence of the reduction of pressure in the passage *q* when the trap discharges. The reservoir is provided with plugs to enable the valves to be removed, and may be formed as part of the steam-trap.

3730. Gold, E. E. Sept. 30, 1908, [*Convention date*].



Heating vehicles; thermostats; steam-traps.— Railway cars and the like are heated by means of an automatic interchangeable pressure or atmospheric steam system, the change from pressure to atmospheric working being effected by opening a blow-off valve which then allows the exhaust steam to act on a thermostat controlling the admission of steam; alternatively, this change may be effected by holding the admission valve open positively, or by allowing its automatic operation.



In the form shown in Fig. 1, a branch D leads steam from the train-pipe to the radiator, in the outlet pipe G of which is fitted a trap valve J operated by the thermostat L, K or by the stem M. When changing to an atmospheric steam heating system, the blow-off valve N is opened and steam passes down the pipe R, heats the liquid in the vessel *a*, and thereby expands a vessel U which communicates with it by the pipe *b*. The expansion of the vessel U and of the vessel T, which is controlled by the expansion of the liquid in the vessel *k* placed in any suitable position in the apartment to be heated, tends to close a valve W normally held open by a spring X. By holding the valve W open by the stem Z, the initial heating of the car is quickened preparatory to heating at atmospheric pressure, the change being effected by withdrawing the stem and allowing the automatic operation of the valve W, which, if desired, may be controlled only by the temperature of the blow-off. Fig. 5 shows a convertible system in which a T-trap H^1 and a gravity trap *r* are used in conjunction with a blow-off valve N^1. The thermostatic liquid is contained in a coil a^1 passing round the discharge pipe *v*. In other arrangements a cylindrical containing-vessel is fixed in the discharge pipe, or the latter may be corrugated to give a larger surface of contact for the coil a^1. Fig. 11 shows a section of the gravity trap *r*. The valve 25 is held against its seat 26 so long as there is any substantial pressure of steam in the pipes, but when the pressure drops the weight 28 tilts the valve to allow the escape of steam and water. The invention may be applied to indirect heating-systems. In this case, the branch steam-pipes pass through coiled water-pipes in connexion with the

radiators, but the control is as in the direct heating-systems.

3848. Gold, E. E. Nov. 17, 1908, [*Convention date*].

FIG. 1.

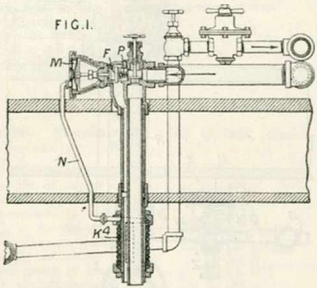


FIG. 2.

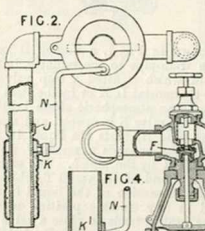


FIG. 3.

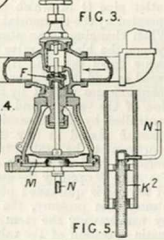
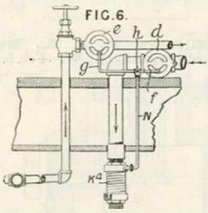


FIG. 4.

FIG. 5.

Heating vehicles; *steam-traps*.—The trap and admission valves of steam heating-systems for railway vehicles &c., more especially convertible pressure and atmospheric systems such as are described in Specification 3730/09, are operated by vessels which are expanded by the increase in pressure conveyed to them from inexpansible vessels containing thermostatic liquids, which are exposed to the heat of the discharged steam and water. When the convertible system shown in Fig. 1 is acting as a pressure system, the trap valve F, normally held open by the spring P, is controlled by the expansible vessel M which is in communication with the coil K⁴ containing the thermostatic liquid by the pipe N. Figs. 2 and 3 show an horizontal trap valve device actuated by the expansion of the liquid in the corrugated jacket K of the discharge pipe J. The valve F may be held open by hand so as to serve as a blow-off valve. Other forms of vessels for containing the thermostatic liquid

FIG. 6.

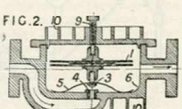


may be used, such as a coiled pipe K¹ supported frictionally in the discharge pipe, Fig. 4, on a tubular vessel K² held therein by brackets, Fig. 5. Both the admission and the trap valves may be operated by this method. As shown in Fig. 6, the coil K⁴, containing the thermostatic liquid, communicates by the pipe N and branches *f*, *g* with the discharge and admission valves *d*, *e*. A hand-operated three-way cock *h* puts the main tube N in communication with either or both of the valves, or cuts them both off. In a modification of this system, the admission and discharge valves are provided with springs to determine at what pressure the thermostat shall act. The operation of these valves may be altered so that the system works either as an atmospheric system or under pressure. The three-way valve *h* alone can also effect the conversion of one system into the other. In a further modification a separate discharge pipe is provided for the blow-off valve, and a thermostatic vessel forming a jacket operates the inlet valve, a similar jacket on the discharge pipe from the trap valve operating the trap valve. All the above arrangements may be applied to indirect heating-systems.

4696. Soc. Haustracte et Cie. Feb. 25, 1908, [*Convention date*]. *Void.* [*Published under Section 91 of the Act.*]

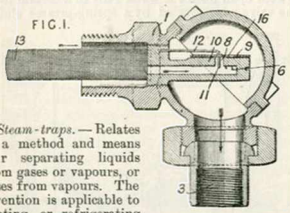
Steam - traps.—The condensation water enters a casing 6 by an inlet 4. An expansible liquid is contained in one or more shallow chambers 1 of thin metal, which on sufficient heating force down a valve 3 closing the inlet 4. When the liquid cools and contracts, the valve is lifted from its seat by a spring 5. The position of the valve is adjusted by a screw 9. Wings 10 are formed on the casing 6 to assist cooling.

FIG. 2.



4962. Brown, C. S. March 23, 1908, [*Convention date*].

FIG. 1.

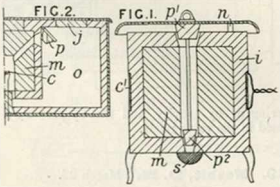


Steam-traps.—Relates to a method and means for separating liquids from gases or vapours, or gases from vapours. The invention is applicable to heating or refrigerating systems in which such a separation is necessary, and is particularly adapted to the separation of water of condensation and air from steam in a steam heating system. The method consists in passing the mixed fluids through a passage having a movable wall by which its size is varied, and so constituted that during the flow of one fluid the resultant pressure on the wall causes it to practically close the passage, while during the flow of one or more other fluids, the passage is kept open. A casing 1 screwed to a radiator or other apparatus in which the separation is to be effected contains a member 10 in which is a passage 6 communicating with the casing 1 through the outlet 8. A disk 9 resting upon a raised seat 16 surrounding the outlet 8 constitutes the movable wall of the passage between the disk and member 10. The disk is guided by a pin 11, which also serves to keep the outlet 8 clean, and its movement is limited by a wire 12. A screen 13 prevents the entrance of dirt into the passage 6. Steam passing through the outlet 8 spreads out in a thin sheet between the disk 9 and member 10, and, the area of the passage rapidly increasing, a reduction of pressure results, which holds the disk towards the member 10 and prevents any substantial loss of steam. When air or water is passing, the reduction of pressure is not so great, and the air or water escapes and passes through the outlet 3.

5777. Bell, G. G., and **Pletts, J. St. V.** March 10.

Heat-storing apparatus comprises a mass of material such as iron having a large heat-capacity for a given volume, and adapted to be heated electrically and to impart its heat to air and other gases as and when required. In an air-heater, the mass m, Fig. 1, and its heat-insulating casing i are traversed by a central passage. The ends of the passage may be closed by insulating-plugs p^1, p^2 carried by a perforated cover, which can rest either on studs n or on the casing. A cage s prevents access of dust to the passage. The hot mass may be enclosed in ovens as partly shown in section in Fig. 2. Here the mass m has a vertical passage, from which other passages lead to ovens o. Doors p in the latter passages are controlled from outside the apparatus, the central passage being in permanent communication with the ovens at its lower end. A portion j of the insulating casing is removable, to allow articles to be heated by the air

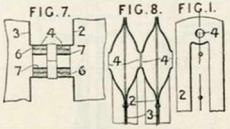
FIG. 2. FIG. 1.



in the ovens. The heat-storing mass may be spherical. The heat-insulating jacket may have polished or silvered surfaces; a vacuum jacket may be used. Specification 22,598/08 is referred to.

6541. Tholt, S. March 18.

FIG. 7. FIG. 8. FIG. 1.



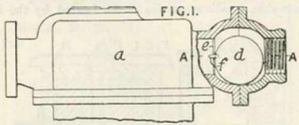
Radiators.—Radiators of the type in which one half-element 2 is welded at its outer edges to a corresponding half-element 3 are provided with necks 4 connecting the elements, pressed out of the metal of the plates. The plates are also in contact with one another at their central line, where they are riveted and welded together, or are riveted and the rivets welded in position. The necks of adjacent elements are connected in various ways. In one form, the neck of one element is smaller than, and enters, the neck of the other element, the two being welded. In others, the necks are equal in size and are welded within an outer sleeve, or the sleeve is placed within, to form a liner. According to the method shown in Fig. 7, nuts 6, tapped with right and left handed threads, are welded in the necks 4, and a hollow screw connector with threads to correspond is then screwed into the nuts 6. A tubular lining 7 may be fitted. In the method illustrated in Fig. 8, the tubular necks are dispensed with, and the circular edges of the apertures abut against each other and are welded.

6738. Burgess, H. L., and **Philip, W.** March 20.

Steam-traps.—The inlet A of a steam-trap a is throttled during the period of discharge by a valve, such as a ball valve d, which is forced by the

pressure of the steam upon a seat *e*, provided with a by-pass *f*. A lift valve may be used, opened by

FIG.1.



a spring or by gravity, and the by-pass may be formed in the valve itself.

6819. Nesbit, D. M. March 22.

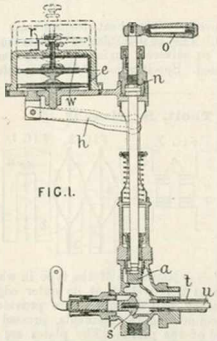


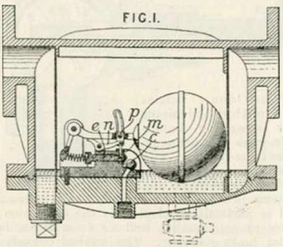
FIG.1.

Thermostats.—A valve *a*, controlling the passage of heating-fluid through a radiator or system of radiators, &c., and operated automatically by capsules *e* through a lever *h*, or system of levers, can be closed when necessary by means of a screw *n* and handle *o*. The valve may act in conjunction with a second valve *s* operated automatically by expansion members *t*, *u* or other thermal devices. The screw stem may be lengthened to bring the handle *o* within easy reach. The capsules are mounted in a removable open frame and are adjustable by means of a screw, the temperature to which they are set being indicated by a pointer *r* on a scale on the screw-head. The frame may be replaced by another containing a different number of capsules. To allow the valve to be mounted directly upon the radiator, a shield *w* of asbestos &c., preferably encased in sheet metal, is provided. Specifications 8532/03, 12,850/04, and 27,687/04, are referred to.

6858. Still, W. M., and **Adamson, A. G.** March 22.

Steam-traps.—In a trap of the type in which a valve, normally held on its seat by the pressure in the trap, is opened by float-controlled means and is kept open until the water falls to a certain level, the valve *c* is operated by a spring-pressed sliding

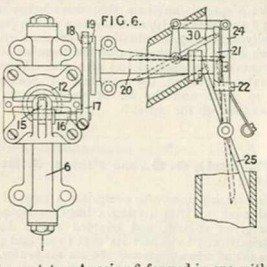
FIG.1.



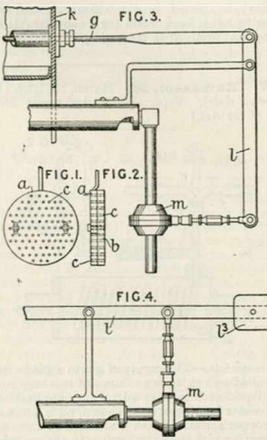
bar *e* controlled by a trigger *m*, so that the valve opens and closes suddenly. A pin *p* on the float lever, working in a slotted link, withdraws the trigger when the float reaches the upper limit of its travel, and at the lower limit the float lever acts upon the trigger-lever *n*. The valve opens when the steam pressure in the trap is cut off. A blow-off cock may be fitted to the trap, and a supplementary outlet may be controlled by a thermostatic device. A removable gauze tube may be used to collect sediment, or the mechanism may be surrounded by a perforated screen.

6901. Hamill, W. W. March 23.

FIG.6.



Thermostats.—A casing 6 formed in one with, or attached to, the exhaust-heated wall of a carburettor contains mercury or other suitable substance which on expanding acts upon a steel diaphragm 12 which, through a plunger lever 15, 16, 17; pin 18, arm 19 and shaft 20 is connected to an L-shaped piece 21 with cam surface 22. This surface, acting upon an arm 24, moves the valves 25, 30, which control the flow of heating-medium, so as to close one as it opens the other.

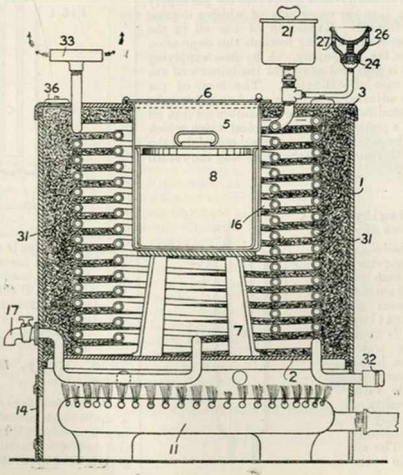


6911. Fletcher, Russell, & Co., Weil, A., and Fletcher, T. W. March 23.

Thermostats. — Apparatus for regulating the supply of gas to a gas burner comprises two perforated disks *a*, *b*, Figs. 1 and 2, one of which is capable of sliding over the other in order to diminish the effective size of the holes *c* through which the gas passes. Fig. 3 shows an adaptation of the apparatus to a vessel *k* containing liquid to be heated by gas. The elongation of the rod *g* due to rise of temperature causes the relative movement of the disk in the casing *m* by means of the lever *l*, the gas being thus shut off with the exception of a pilot light. An adaptation to a gas stove is shown in Fig. 4, wherein the placing of a utensil on the one end of a lever *l*, or the weight l^3 on the other end, operates the valve.

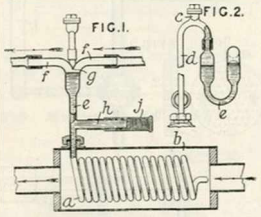
6932. Brown, S. March 23.

Heat-storing apparatus. — A stove comprising water-heating and air-heating coils of tubing and adapted for heating milk and other foods and for other purposes, consists of a closed sheet-metal or like casing 1 with an imperforate bottom 2 and a top 3. Sand, fire-clay, asbestos, or other heat-retaining material, filled in through apertures 36, is packed between a water-heating coil 16 and an air-heating coil 31, and between the latter and the outer casing 1. Inset is a central chamber or hot-closet 5 supported by a tripod 7 and fitted with a lid 6. A chamber 8 containing food for infants, invalids,



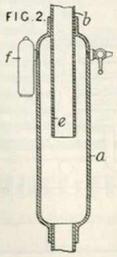
&c. may be placed in the chambers, and after becoming hot is kept warm for a considerable time by the heat retained in the casing.

6997. Ramassot, M. March, 23, 1908. [*Convention date*]. *Void.* [*Published under Section 91 of the Act.*]



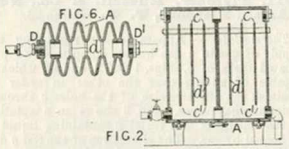
Thermostats.—The supply of gas to a gas heater is controlled by a valve or a column of mercury moved by a liquid such as olive oil. In an application to a hot-water heating system shown, oil is contained in a copper spiral *a*, which is situated in a chamber *b*, through which the water returns to the gas heater. The spiral is connected by a pipe *d*, Fig. 2, with a filling-cap *c*, to a U-tube *e*, containing mercury. The U-tube is preferably made of glass. The other limb of the U-tube opens into the gas supply pipe *f*, Fig. 1, in the upper side of which a depression *g* is formed. Expansion of the oil in the spiral *a* forces the mercury towards this depression and reduces the gas supply. A by-pass supplying a pilot jet is provided to relight the burners of the heater in case of extinction. The level of the mercury is adjusted by a screw cap *j* on a side tube *h*. In a modified form the expansion of the oil presses up a piston carrying a conical valve which regulates the gas supply. The vessel containing the oil may be formed as a jacket enclosing the return water pipe.

7040. Bagley, S. March 24.



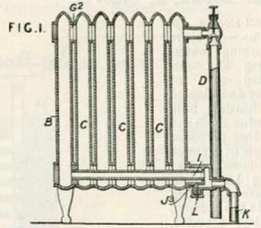
Heating buildings.—Upon the return pipe *b* or each return pipe of a steam heating-system an air-separating chamber *a* is fitted above the water level of the boiler and is provided with an air valve *f* or a plurality of valves whereby air can be periodically released. The air collects in the annular space between the extension tube *e* and the casing.

7055. Edgar, A. C., and **Patton, R. A.** March 24.



Radiators.—A radiator is made in sections A, each of which is corrugated deeply on both sides, the corrugations running the whole height of the radiator. The depressions are connected within the radiator by webs *d* which stop short of the top and bottom so as to leave passages *c*, *c*¹ for the circulating fluid. When used for steam, the radiator is fitted with single end sections D, D¹, Fig. 6, communicating with the main sections A at the lower end only.

7489. Zeck, A., and **Zeck, F. van.** March 29.



Radiators.—Steam for heating enters the radiator through the pipe D and is condensed in the sections C. When the accumulated water of condensation rises above the level of the opening G² it flows down the end section B through the tube I to the exit K. A valve L controls an aperture J³ for emptying the radiator.

7830. Holly, E. P. April 1. *Drawings to Specification.*

Heating buildings.—In a steam circulating system, a multi-stage screw pump with adjustable-pitch impellers of graduated diameter is used to return the hot condensation water to the tank of a gravity-feed apparatus for the steam-generator.

7964. Nesbit, D. M. April 2.

FIG.2

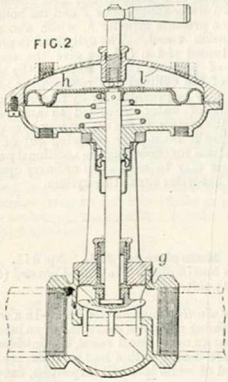
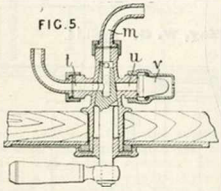


FIG.5.



Heating by circulation of fluids.—The supply of heating-fluid to the several units, such as radiators &c., of a heating system is controlled by valves operated electrically, or by fluid pressure from a central switchboard, the invention being applicable also to controlling ventilating-valves. A fluid-operated valve suitable for use in a low-pressure steam heating-system in which the return main is maintained at a pressure below that of the atmosphere is shown in Fig. 2. The valve *g* is connected to a flexible diaphragm *h*, which divides a casing *l* into two compartments, of which one communicates with the atmosphere and the other can be put into communication with the atmosphere or with the return main of the system, so as to open or close the valve as required. This is effected at the switchboard by means of a cock, such as the hollow-plug cock shown in Fig. 5. The pipe *m* communicates with the casing *l*, and the pipe *t* with the return main, the pipe *u* communicating with the atmosphere through a steatite strainer *v*. A valve operated by means of a solenoid, the soft-iron core of which is attached to the valve stem, is also described. Means are provided at the switchboard for showing the positions of the several valves. The system may be combined with systems of thermostatic and hygrostatic regulation, such as those described in Specifications 12,850/04, 12,852/04, 27,687/04, 17,339/06, 9400/08, and 18,969/08.

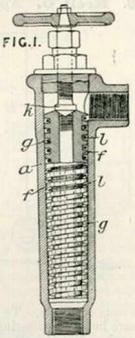
8022. Wahlen, P. G., and **Wahlen, C.** April 3.

Non-conducting coverings for heat. — In coating surfaces by applying alternately coatings of an agglutinant and a filling-material, the filling-material is applied in a more finely divided state in each subsequent layer. As agglutinants, glue, which may be hardened by treatment with formaldehyde, oil, varnish, solutions of lac or of nitro- or acetyl-cellulose, celluloid, cellit, &c. may be used ; and as filling-materials, ground cork, sawdust, wood meal, asbestos fibres, or vegetable fibres may be used. The filling-material may, before application, be soaked in varnish, oil, or lac solution. A sheet of cotton or hemp fabric may be embedded in the coating. The coatings are applied to metal and wood surfaces that are exposed to the weather or are frequently handled, such as latches, the hand-rails &c. of vehicles, walking-sticks, umbrella handles and sticks, and hand-tool handles, and are stated to be elastic, water-proof, and non-conducting.

8395. Hänsel, P., and **Hupfauf, J.** April 7.

Steam-traps.—A tubular casing *a* having a smooth tapering internal surface is provided with a long tightly-fitting screw-threaded core *f*; the groove *g* through which the water of condensation escapes, may have a gradually diminishing cross-section. A multi-threaded screw may be used, and a wire or wires *l* of suitable length and cross-section may be inserted in the groove to adjust the apparatus to different steam pressures. The core may have a central passage with a valve *k* for blowing-through.

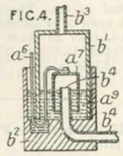
FIG.1.



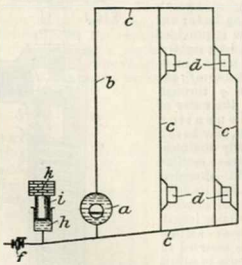
8551. Rorke, T. J., and **Rorke, E.** April 8.

Thermostats.—The passage of the gas from an inlet b^3 to an outlet b^4 is controlled by a bell a^7, the rim of which, when submerged in the liquid a^9, stops the flow completely. One or more openings in the top of the bell may be provided as a by-pass. Or, a series of holes may be made in the side of the bell, more or less of which may be opened by adjusting the degree of immersion of the bell, or, a sleeve sliding on the outside of the bell may be used to cover them. The liquid is contained in a vessel b^2, and the inlet b^3 is formed in a removable bell or cover b^1. The bell a^7 is carried by a bent arm a^6, which passes under the bent edge of the cover b^1 and is secured to a lever. The lever is operated electro-magnetically after the manner of the switch lever in the switch described in Specification 12,175/08, [*Class* 38, Electricity, Regulating &c.]. The apparatus may be employed for "flash advertisements" by arranging a series of such apparatus to control the respective illuminated compartments of the sign. The apparatus may be used as a thermostat In a heating-system by providing a thermostatic arrangement such as is described in Specification 9481/08, for controlling the circuits of the electro-magnets which actuate the bell-carrying lever. Several valves may be operated by one lever.

FIG.4.



8556. Krell, O. April 8.



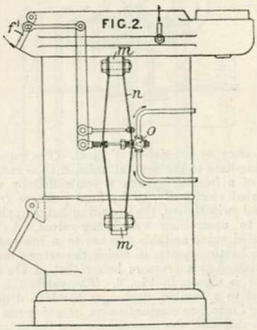
Heating buildings.—To heat the water in a low-pressure hot-water heating-system to a temperature higher than 100° C. without the formation of steam, the water in the system is subjected to an additional external pressure of such an amount that the pressure at the highest water-level in the system is greater than the steam pressure corresponding to the highest temperature arising in the system. The Figure shows the usual boiler *a*, flow and return pipes *b*, *c* respectively, and radiators *d*. Between a water-supply cock *f* and the boiler *a*, is provided a pressure cylinder *h*, which also acts as an expansion vessel. The cylinder *h* is provided with a loaded piston *i*, *k*, to give the necessary increase of pressure to the water in the system. Instead of the cylinder and piston, the additional pressure may be provided for by means of a pump or column of water connected to any suitable place in the system, or the system may be connected to a hydraulic main. By throwing out of action the apparatus for producing the additional pressure, the system may be used as an ordinary open low-pressure hot-water circulating-system.

8702. Humphreys, J. L. April 13. *Drawings to Specification. No Patent granted (Sealing fee not paid).*

Non-conducting coverings for heat.—In a cold and heat retaining appliance consisting of an inner glass vessel and an outer metal vessel, the outsides of the vessels are coated with a lead solution, preferably composed of white lead and turpentine, fixed on.

8857. Hay, W. G. April 14.

FIG.2.



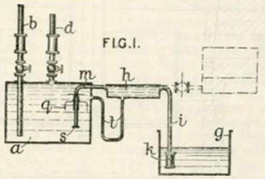
Thermostats.—In a tubulous instantaneous generator, the supply of water, and, in some cases, the air supply to the furnace, or the fuel supply to the heating-burners are controlled by the expansion and contraction of a body of metal enclosing, or connected to, the tubes of the generator. In the generator shown, which consists of two coils of tubing embedded in a metal casing, the feed-water

valve *o* and the damper f^1 are controlled by the expansion and contraction of the metal casing, which is communicated to the valve and damper through bars *n* secured to the lugs *m* on the casing.

8876. Senn, H., and **Klüger, D.** April 14.

Non-conducting coverings for heat and sound.—A dense kind of slate containing up to about 10 per cent of organic matter, for example, mica slate, argillaceous slate, and coal slate, is calcined at a temperature of about 1200° C. in order to produce a porous product suitable for heat insulation, sound-deadening, filtering, and building purposes. The product may be cut into blocks or plates, or may be broken up, mixed with a suitable binding-agent, and moulded.

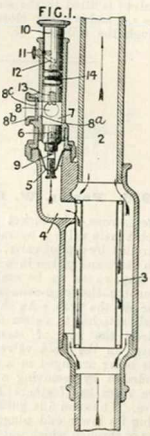
10,161. Rouquaud, L. April 29.



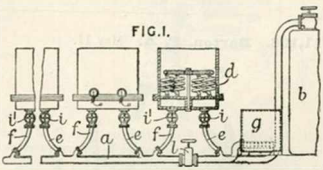
Heating buildings.—Comprises automatic steam or hot-water circulating apparatus for use in connexion with heating systems. The water is heated in a boiler *a* connected by means of a pipe *m* and U-tube *t* with a separate chamber *h*, into which cold water is drawn through the pipe *i* fitted with a non-return valve *k*. The float *q* normally rests upon the plate *s* closing the pipe *m*, but as soon as the water boils, vapour collects in the float which rises and thereby closes an orifice in the pipe *m*. The pipe *d* being closed, boiling water is rapidly forced up the hot-water service pipe *b* until the level of the water in the boiler falls sufficiently to lower the float, whereupon steam is admitted to the pipe *m*, and the cold water in the chamber *h* is discharged through the pipe *t* into the boiler. A rapid condensation of the steam is thereby effected, and the boiler *a* and chamber *h* refill with cold water from the tank *g*. When used for supplying steam, the pipe *b* is closed and the pipe *d* opened. In a modification, the chamber *h* is arranged above the boiler *a*, and this form may conveniently be fitted in an ordinary fire-place.

10,215. Ramassot, M. March 3, [*Convention date*].

Thermostats.—A gas-regulator for a hot-water system comprises a thermally-actuated plug 6, connected by an adjustable rod 9 to a cupped diaphragm 5, and a hand-operated plug 10, both sliding in a tube 7 provided with gas ports 8. The diaphragm 5 is actuated by the expansion of a liquid, such as glycerine, or glycerine and water, contained in a thin metal chamber of annular form situated in the circulating-pipe. The plug 10 has a guiding-screw 11 working in an inclined slot 12, and a screw 13 to prevent complete closure of the gas passage. An inspection orifice in the tube 7 is closed by a glass window 8ᵃ.



10,557. Yates, J. H. May 4.



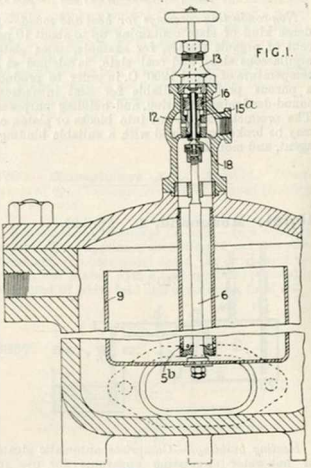
Heating by circulation of fluids.—Steam coils for use in heating, drying, evaporating, cooking, distilling, &c. are joined in parallel with a steam main, and are arranged so that the exhaust from one coil passes back into the main, and thence, after mixing with the live steam, into the next coil. The branch pipes do not descend into the main but leave its passage unobstructed. Fig. 1 shows the system applied for the heating of a series of boiling-vats. Steam from the generator *b* passes into the main *a*, and enters the first coil by the

pipe *e*. The exhaust steam and water of condensation return to the main by the pipe *f*. The mixed live and exhaust steam then enter the next coil. A valve *l* is fitted in the steam main between the pipes *e*, *f*, and is partly closed at starting to blow through the coils *d*; or, it may be partly or wholly closed when great heat is required. Regulating-valves *i*, *i*¹ are fitted in the pipes *e*, *f*. The main finally exhausts into the condenser or feed-tank *g*, or into the atmosphere. Steam for working an engine, or distilled water, may be tapped from the main if desired.

10,936. Porter, W. H. May 10.

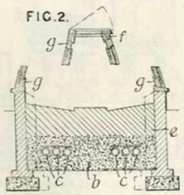
Steam-traps.—A bucket trap, of the type in which a main valve is operated by a hollow piston controlled by a pilot valve, has the housing for the main valve and piston in a recess in the casing of the trap, so as to be easily removable without disturbing the pipe-connexions or removing the cover of the trap. As shown, a pilot valve 18 loosely attached to a stem 6 carrying the bucket 9, controls the flow of steam through a central passage in the main valve on a piston 16, these parts being arranged in a sleeve 12, which can be withdrawn by removing a plug 13. The main-valve stem has feathers 15^a to guide it in the sleeve. The stem 6 is guided in a depending tube having its lower end plugged and provided with holes 5^b through which water and steam pass from the bucket.

FIG. 1.



11,106. Barton, F. A. May 11.

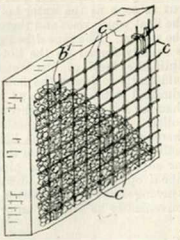
FIG. 2.



Heating buildings.—A greenhouse is heated by pipes laid under the soil. The pipes *c* are laid in a bed *b* of brick, rubbish &c., and soil *e* placed above.

11,372. Hahn, J. B., and **Kmunke, R.** May 13.

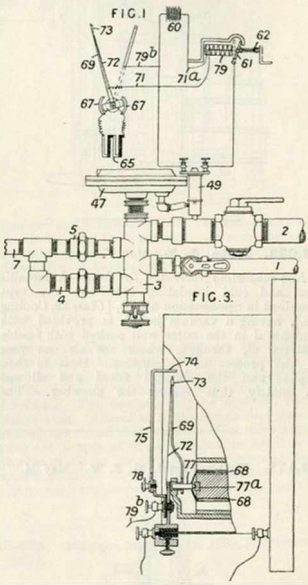
Non-conducting coverings for heat.—A jointless glass lining for cooling-chambers &c. is formed in situ by suspending a net or trellis-work *c* on hooks b^1 a short distance from the surface to be covered, the space behind the net being then filled in with glass chips which are fused together by a blow-pipe and enclose the netting. Glass powder is blown on at the part acted on at any



moment by the flame. The pieces of glass and glass powder may be mixed with crude oil or other similar combustible material into a mass which is applied and fused as described above, or the combustible material may be ignited before the fusing operation, to heat the walls and glass.

11,840. Machlet, G. May 19.

Thermostats.—A thermo-electric apparatus for controlling the supply of gaseous fuel and air to furnaces for annealing, hardening, or otherwise treating metal and other articles, melting metal, &c. consists of a thermo-electric element affecting by its current an indicating-device which operates gas and air controlling means. Pipes 1, 2 supply gas and air, respectively, to the valve casing 3. The outlet gas and air pipes 4, 5 unite in a pipe 7, which conveys the mixture to the furnace burners. When a solenoid 49 is energized by the current from a battery 60, air passes from the supply-pipe 2 to the diaphragm chamber 47 and lifts the valve, but when the solenoid is de-energized, its core drops, cutting off the air supply to the chamber 47 and permitting air to vent from it, thus causing the valve to close. The thermo-electric element 65 is arranged partly in the furnace heating chamber and actuates a volt-meter or galvanometer 67, on the scale of which is indicated the furnace temperature, or the current, or both. The index 69 rotates with the wires &c. 68 of the volt-meter upon a pin 77, which is pivoted on a seat 77^a, and is provided with a contact 73 to which is secured a wire 72. This is hooked into an eye upon a metal plate fastened to the volt-meter casing &c. and carrying a terminal to which is secured the wire 71. Mounted so as to turn concentrically with the index, is a metal arm 75 terminating in a bent end 74, forming a contact which may be set and secured by a nut 78 at any desired point on the instrument scale corresponding to the temperature to which it is desired to heat the furnace. The wire 71 is connected to an electro-magnet 79, the coil of which may be made of resistance wire, and wires 79^b, 71^a make a connexion with the battery. At starting, the current flows through the solenoid 49, thus opening the valve and allowing the passage of gas and air to the furnace. As the furnace becomes hotter, the index 69 swings over, and ultimately the contacts 73, 74 meet. The electro-magnet 79 is energized, and the circuit of the valve-controlling solenoid is broken by the movement of the switch arm 61. The valve then shuts off wholly or partly the air and gas supplies. The furnace cools and consequently the contacts 73, 74 separate; the circuit through the electro-magnet 79 is broken, the spring 62 closes the switch 61, the current again flows through the valve-operating solenoid, and the valve opens to supply gas and air to the furnace, which is thus maintained at an approximately constant temperature.

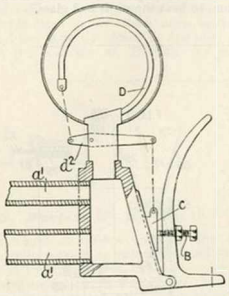


12,000. Wicksteed, C. May 21.

Steam-traps.—In a steam-trap of the type described in Specification 6004/06, having expansion tubes a^1, and a reservoir with a valve placed below the tubes, a Bourdon tube D acts either directly, or through a rack or a lever d^2, on a wedge-shaped block c sliding over an inclined surface on the head. The valve lever, which carries a set-screw B, is thus adjusted for varying steam pressure.

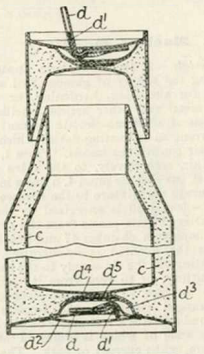
(*For Figure see next page.*)

12,000.



12,022. Fate, J. L. *Jan. 7.*

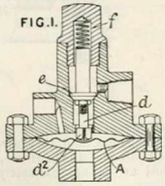
Non-conducting coverings for heat.—A metallic heat and cold insulating vessel of the type described in Specification 435/09, [*Class* 29, Cooling &c.], having a vacuum jacket, is provided with a nipple d in the outer wall packed with fusible material d^1, through which the air can pass in the process of exhaustion. Heat is then applied and the material fused and allowed to solidify, thus sealing the chamber. The projecting end is then cut off, and a cap d^2 preferably brazed to the outer face of the wall of the shell, as shown in the lower part of the Figure.



When the vacuum chamber is filled with lamp-black or other insulating-material, the inner end of the nipple d is located in a clearance chamber d^3 separated from the lamp-black c by a double-walled partition d^4, holding between the perforated walls a piece of porous textile fabric d^5.

12,171. Rutherford, E. J. Y. May 24.

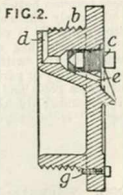
FIG. 1.



Thermostats.—The diaphragm A of an automatic regulator is composed of a number of metallic members, the inner one being constructed of resilient material such as steel, and the outer sheath or sheaths of copper or like metallic non-rusting material to protect the inner layer from contact with the controlling-medium. The valve e has a screwed extension d, whereby the amount of clearance between the diaphragm and the tappet d^2 may be adjusted. The valve may be removed on unscrewing the cap f.

12,212. Watts, C. J. May 24.

FIG. 2.



Heating buildings.—In a radiator for heating buildings, a plug in which there is a passage d, e for the blowing-out of air has its screwed portion b differing in pitch from the thread on the radiator, by, for example one-half thread in sixteen, and it may also taper. A set-screw g may, in addition, be provided. The object is to ensure a tight fit when the plug is rotated to bring the air-release valve c at the top.

12,361. Cramer, S. W. May 25.

FIG. 1a

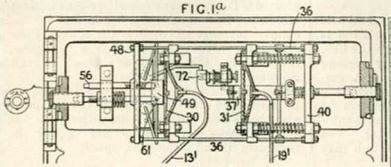
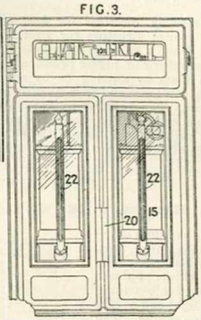


FIG. 3.



Thermostats.—The amount of moisture in factories &c., and the temperature, are regulated by means of the mechanical action of wet and dry bulb thermometric devices. Mercury thermometers 22 are shown fitted, but the actuating-instruments consist of curled tubes filled with ether &c. and communicating by extensions 13¹, 19¹, Fig. 1ª, with elastic diaphragms 31, 30. Too great a diminution of the dry-bulb temperature alone, or excessive rise in the wet-bulb readings causes an auxiliary valve 61 or 72 to be opened, and the conditions to be modified by the opening or closing of a valve. In another form the expansible liquid is contained in curved tubes supported in sliding guides at either end and arranged so that the movement of the devices due to changes in temperature acts directly on the valve stems or seatings without the intervention of diaphragms.

13,060. Paterson, W. *July 24, 1908.*

FIG. 4.

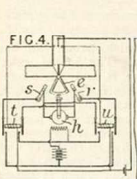
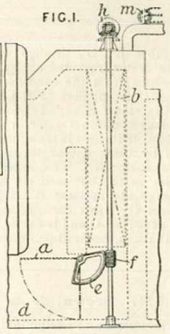
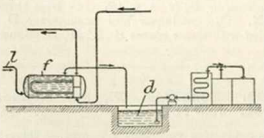


FIG. 1.



Thermostats.—To control the temperature of superheated steam, a thermostat closes an electric circuit which controls means for regulating the flow of flue gases to a superheater; the thermostat reverses the current at a minimum temperature. In the arrangement shown in Fig. 1, a thermostat *m* controls a motor *h*, which operates a damper *a* by means of a worm *f* and a quadrant *e*, thereby allowing gases to pass to a superheater chamber *b* or to a flue *d*. The connexions of the motor are the same as those described in Specification 15,788/08, the thermostat closing the motor circuit, either directly or indirectly through relays *t*, *u*, as shown in Fig. 4. An arm on the spindle of the damper opens one of two switches *r*, *s* when the damper reaches the extreme positions. Two dampers may be used, one controlling the inlet of cold air. The dampers may be operated by a steam piston. According to the Provisional Specification, the circuit may control a pilot valve regulating the supply of steam or pressure fluid to a cylinder or motor, or to a piston governing the motor-controller. A brake may be applied to the motor, which is released when the circuit is opened.

13,325. Nager, E. Aug. 3, 1908, [*Convention date*].



Heating buildings.—In steam heating-systems provided with an economizer through which the condensation water is returned to the boiler, the condensation water before passing to the economizer is used to heat other water. A pipe *l* brings condensation water from the steam-traps &c. of the system to a heat-interchanger *f*, where it heats other water and whence it passes to the feed-tank *d*.

13,390. Laarmann, F. June 23, 1908, [*Convention date*].

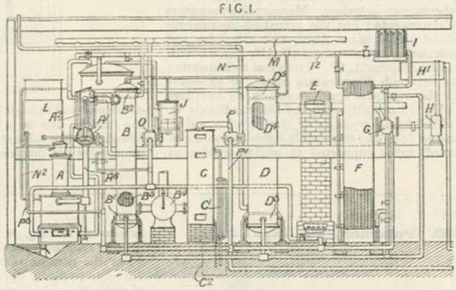
Non-conducting coverings for heat.—An elastic foam or sponge structure for heat insulation is produced from a solution of rubber or the like, under atmospheric or higher pressures, by working it into a foam by stirring or by adding a gas-generating substance and subsequently evaporating the solvent. The foam is fixed, for example by hot or cold vulcanization, before, after, or simultaneously with the expulsion of the solvent. The sulphur chloride used for cold vulcanization may be injected as a solution or in the gaseous state. If the gas, preferably nitrogen, in the cells of the structure is above atmospheric pressure, the drying and filling into moulds &c. are carried out under a counter-pressure and before the filling of the substance into tyres &c. through a feed-pipe, the pressure in the preparing-vessel is relieved. Specification 3314/06 is referred to.

The Specification in its original form, as open to inspection under Section 91 (3) (*a*), comprises also the use of cellulose alternatively to rubber; this subject-matter does not appear in the Complete Specification as accepted.

13,537. Kitchen, J. M. W., and **Bernuth, O. von.** June 9.

Heating buildings &c.—Relates to a power, heat, and light generating system in which producer gas is used for obtaining heat and light and as fuel for a gas-engine. The heat obtained in cooling the producer gas, and the heat of the jacket water and exhaust gases of the gas-engine are used to heat water for heating purposes, and for producing and superheating steam which is supplied to a steam-engine, the heat of the exhaust of which is used for heating purposes. The gas from the producer A passes on its way to a condenser B through a heat interchanger A^2, through which pass in a counter-current direction air, steam, and hot waste gases to the producer. The producer gas then passes through a scrubber C, and is supplied to a furnace E, a gas-engine C, and a reservoir L. The cooling-water of the scrubber is used circuitously and is pumped through a radiator C^1, which heats the surrounding air for respiration or combustion. The combustion products of the furnace E are mixed with the gas-engine exhaust and supplied to an economizer D, from which they pass through pipe N. The condenser and economizer D are provided with water spaces B^1, B^2, D^3, D^2 connected by tubes B^3, D^4, through which passes the hot jacket water from the engine. The heated water or steam from the condenser B and the economizer D is supplied to the heating system P^2, I, or the steam is supplied to the engine J. The condenser cooling-water is used in the heating system, or its heat is transferred to air for combustion by being passed through an air-heater and water-cooler N. The condensed exhaust steam passes to the hot well C^2, from which it passes through the radiator B^1. The air heated by the system is drawn through an air conduit M by the exhauster O and is forced to various places for combustion, respiration, or accessory heating.

FIG. 1.



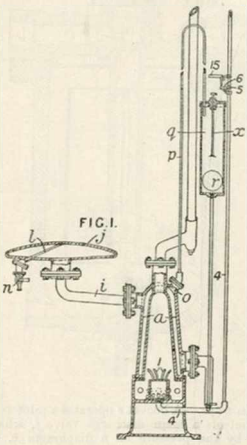
13,693. Lonsdale, T., and **Lonsdale Bros.** June 11.

Non-conducting coverings for heat.—Coverings for pipes, boilers, &c. are formed by moulding silicate cotton, slag-wool, asbestos, &c. to the form required, dipping it in a composition containing 95 per cent water, 2½ per cent starch, and 2½ per cent silicate of soda, and allowing it to dry in position.

13,871. Brown, J. A. June 14.

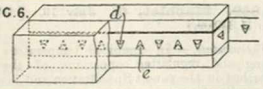
Thermostats.—Pressing-tables, ironing-rollers, &c. are heated by the circulation of oil, the temperature of which is controlled automatically. An oil-heater *a* is connected by a pipe *i* with a suitably-shaped ironing-block *j* and is heated by gas-burners 1 supplied through a pipe 4, provided with a gas cock 5 having a spring-controlled arm 6 normally held down by a weighted lever 15. In the expansion tank *q* is a float *r*, which, when lifted sufficiently by an increase in volume of the oil in the system due to a rise in temperature, engages a rod *x* and

so lifts the lever 15 to allow the arm 6 to close the gas cock. A vapour outlet *o* leads to a condensing-



tube *p*, and any air and vapour in the table *j* may escape through a pipe *l* and cock *n*.

13,920. Genest, W., and Stössel, H. June 14.

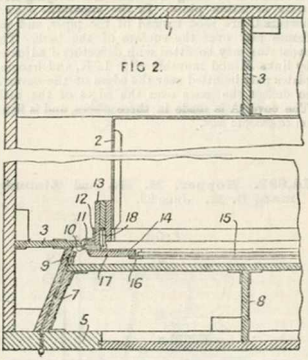


Non-conducting coverings for sound.—A sheet or pad for deadening vibrations and sound from machinery installations, railways, &c. consists of separate strips of cork *c* held together by a surrounding band or hoop *a*, wherein are cross-bars or tie-rods *b* forming a grid to prevent the distortion of the pad when under load. The strips *c* are thicker than the bars *b* or band *a*, as is shown in Fig. 2. The cork may be treated with oils or other practically non-drying liquids to enable it to retain its properties, such liquids preferably having antiseptic powers. In addition, strips of material may be inserted between the pieces of cork (Fig. 6), such strips having roughnesses or teeth *d*, *e* to prevent the pieces from shifting relatively to one another.

14,007. Partridge, W. H. June 15. *Drawings to Specification.*

Non-conducting coverings for heat.—Cold-storage rooms are constructed of two layers of wooden boards between which are two layers of insulating-paper and a thickness of compressed cork slabs; or felt, hair, slag-wool, &c. may be employed.

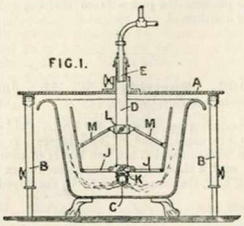
14,548. Childs, J. G., and Hill, T. S. June 21.



Heating-apparatus.—A metal oven 2 is supported within a casing 1 of wood &c., preferably provided with a marble top, by slabs 3 of asbestos-plaster or other non-conducting material placed on edge and fixed by angle-irons. The oven door consists of a glass sheet 15 held by asbestos or other packing between a metal frame 14 and a metal strip 16, and surrounded by a border 17 of asbestos plaster &c. The door is hinged at 10 to a non-conducting strip 11 fixed by an angle-iron 12 to a non-conducting sheet 13 secured to the oven, and is closed upon folded strips 18 of asbestos &c. secured between non-conducting sheets as shown. The casing 1 has an opaque hollow door 5 which is splayed inwards, the back and sides being formed of insulating-sheets 7 fixed together by angle-irons; a strengthening-stay 8 may also be provided. The door 5 abuts on folded strips 9 similar to the strips 18. The space between the oven and its casing may be filled with slag-wool or the like, the door 5, according to the Provisional Specification, being similarly filled.

14,657. Pearman, D. June 22.

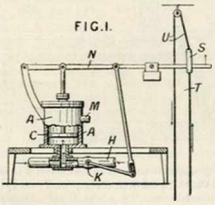
FIG. 1.



Heating-apparatus.—An apparatus for stove-enamelling baths in situ consists of a table-like structure A covering the bath and carrying hot-water or steam pipes. In the apparatus shown, burners C are used instead of the pipes, and the flames play over the surface of the bath. The apparatus may be fitted with deflectors J adjusted by links M and movable clips L, K, and hanging plates may be fitted near the edges of the cover A to deflect the gases over the edges of the bath. The cover A is made in three pieces, and is fitted on telescopic legs.

14,692. Hopper, H. H., and **Zimmerman, C. H.** June 23.

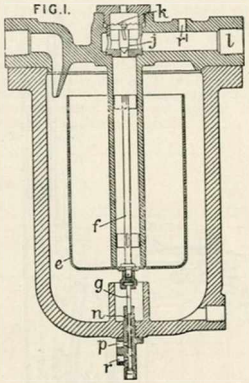
FIG. 1.



Heating buildings.—A regulator for the furnaces of hot-water boilers operates so that the expansion of the water under heat forces out a piston C in a cylindrical expansion tank A. This piston actuates a lever N operating a damper checking the air supply to the furnace, through the link S and cable U. If the pressure falls, the lever N in descending not only opens that damper again but if the descent is continued closes a damper in the smoke pipe through a cable T, at the same time opening a valve K admitting cold water under pressure from the main H to the underside of the piston, to cause the same to rise. An overflow pipe M is fitted.

16,597. Davidson, J., and **Larmuth, W. O.** July 16.

FIG. 1.

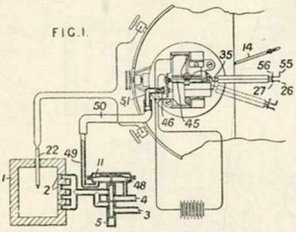


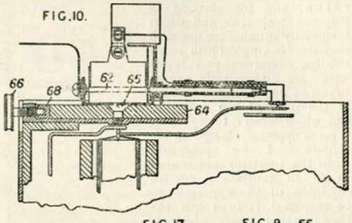
Steam-traps.—A bucket *e* operates a pilot valve *g* and controls a main discharge valve *j*, which is closed by the pressure on a diaphragm *k*. The diaphragm chamber is connected by a small pipe (not shown), to a port *p*, which is connected through the valve *g* either to a port *n* inside the trap or to a port *r* connected by another pipe to an opening r^1 in the discharge passage. The bucket is guided on a tube by a rod *f* provided with feathers. The valve *j* has diagonal wings causing it to rotate when the trap discharges. In a modification, the port *r* is controlled by a spring-pressed valve actuated by the plug *g*.

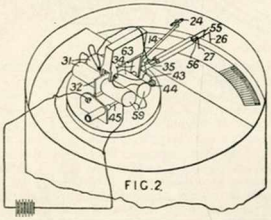
16,849. Machlet, G. July 19. [*Addition to* 11,840/09.]

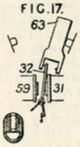
Thermostats.—In combined temperature indicating and regulating apparatus of the type described in the parent Specification and in which the needle of a galvanometer or volt-meter operates to close an electric circuit having means for regulating the supply of fuel and air to a furnace, means is provided for raising the fixed contacts out of the path of the needle after the closing of the circuit in order that the needle may also indicate subsequent variations of the furnace temperature, and two pairs of fixed contacts are provided in order to limit the fluctuations in the furnace temperature. A furnace 1, Fig. 1 having burners 2 supplied with gas and air through pipes 3, 4 respectively, and the regulating-valve 5, is provided with a thermo-couple 22 for deflecting the galvanometer needle 14 to an extent dependent upon the furnace

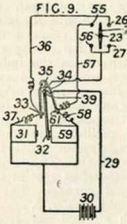
temperature. The valve 5 is connected to a diaphragm 11 in a chamber 48 open on its under side to the pressure of the air in the pipe 4, and also through a pipe 49, flexible tube 50, elbow 51, and valve 46, to the atmosphere. Upon the galvanometer needle 14 is pivoted a metal bridge 24, Fig. 7, the movements of which are limited by a U-piece 25, and which serves to bridge the fixed







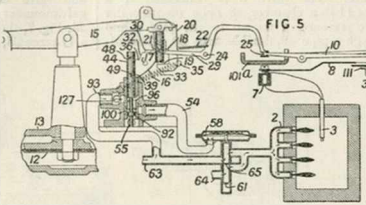


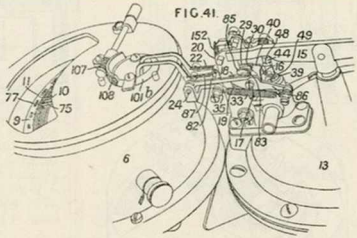


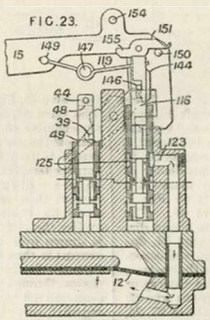
contacts 26, 27, Figs. 1 and 2, or 55, 56. These contacts are mounted on a rocking-shaft 35, upon which is fixed an arm 34 carrying a weight 63 and contacts 33, 61, Fig. 9. An armature 32, Figs. 2, 9, and 17, mounted between electro-magnets 31, 59 works upon a shaft 62, Fig. 10, independently of the shaft 35. This shaft operates by means of a sector 43, Fig. 2, and pinion 44, a shaft 45, Fig. 1, carrying at its end the relief valve 46. The arrangement of the electric circuits is shown diagrammatically in Fig. 9. When the part 24, due to increase of the furnace temperature and consequent motion of the needle 14, bridges the contacts 26, 27, a small current flows from the battery or other source of electricity 30 through the wire 29 to a pivot screw 39 through the contacts 27, 26, wires 36, 37, and electro-magnets 31, and thus the armature 32 is drawn over until it touches the contact 33. This short-circuits the current from the screw 39 through the armature, and the contact 33, and thus permits a larger current to pass through the electro-magnets 31, over to which the armature swings, pulling with it the arm 34. The motion of this is continued by the weight 63, Fig. 2, after the arrest of the armature by the magnet 31, Fig. 9, and the shaft 35 is turned; this raises the contacts 26, 27 out of, and places the contacts 55, 56 in the path of the needle, and turns the valve 46, Fig. 1, through gearing 43, 44, Fig. 2. The valve 46, now open, allows air to escape from the chamber 48, and the valve 5 wholly or partly cuts off the gas and air supplies. The instrument needle is free to indicate any alteration of the furnace temperature, and as this falls the contacts 55, 56 are ultimately bridged by the part 24. A current then passes through the wire 29, Fig. 9, screw 39, contacts 55, 56 and wires 57, 58, and excites the electro-magnets 59. The armature 32 is drawn over to touch the contact 61, and the current is thus short-circuited through the armature to the contact. A stronger current then passes through the electro-magnets 59, and the armature 32 and arm 34 are thus drawn over together, turning the shaft 35 so as to remove the contacts 55, 56 out of the path of the needle and replace the contacts 26, 27. Simultaneously the valve 46 is closed by the gearing 43, 44, the diaphragm 11 rises, and the fuel and air supply is increased. The contacts 26, 27, 55, 56 may be adjusted to any particular point on the scale by turning the table 64, Fig. 10, carrying the mechanism, about the screw 65, and a thumb-screw 66 which presses a friction block 68 against the table edge may lock the table in position. The stroke of the arm 34, which is greater than that of the armature 32, is limited by stops.

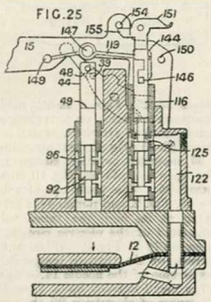
16,947. Machlet, G. July 20.

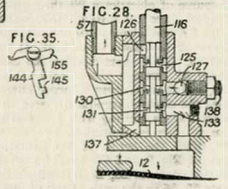
Thermostats. — A generally-applicable regulating-apparatus, which may be used with furnaces for hardening steel and heating metal, &c., or with other heating or cooling apparatus, and for starting or stopping mechanism, and which is specially suitable for use with indicators having delicate index needles, comprises two levers which are alternatively caused to dip at pre-determined points in the path of the indicator, and which when intercepted by it cause opposite changes in the condition of the apparatus; when the indicator has moved so as to indicate a certain condition of the apparatus to be regulated, it intercepts the then moving lever, which is then automatically latched out of use, and effects a change in the condition of the apparatus which causes the indicator to move towards and eventually to intercept, the other lever, now automatically set in motion. The levers may be operated by the oscillating arm of a diaphragm motor actuated by compressed air. The invention is illustrated as applied to a gas-fired furnace. The furnace burners 2, Fig. 5, are supplied with air and gas from pipes 63, 64 respectively, through a regulating valve 61 divided into two parts by a partition 65 and operated by a diaphragm 58. A thermo-electric element 3 is connected to the moving coil 7 of a galvanometer or voltmeter 6, the needle 8 of which shows on a scale 9 the furnace temperature. Two levers 10, 75 having projections 11, 77, Fig. 41, and so arranged that when one is operating the other is latched out of use, are arranged over a portion of the scale, and, as the needle swings over from zero while the furnace is being initially heated, the projection 11 repeatedly dips in the path of the needle. These levers are operated through universal joints 25, 80 by bent levers 29, 82 swinging on a common axis 24 and connected to springs 22, 87, which tend to force the teeth 11, 77 into the path of the needle. The reciprocating arm 15 of the compressed-air engine 13 actuates the levers 29, 82 through the connected levers 16, 86, which oscillate about the common shaft 17 and are secured by a spring 33 to a fixed stud 35 on the frame. As the bent end 29 of the arm 15 performs its downward stroke, the



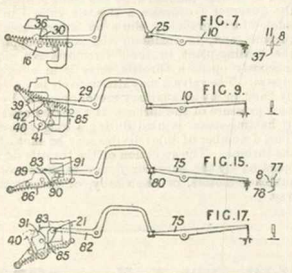






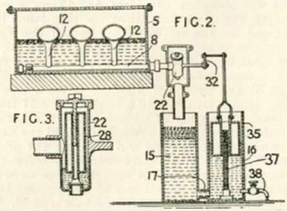


shoulder 18 engages the pin 21 on the connected levers, oscillating them about the shaft 17 and allowing the bent end 30 of the lever 29 to fall as the inclined edge 32 passes beneath it. The spring 33 at first opposes the movement, but, when the



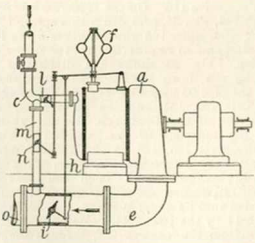
connected levers pass the dead centre, the spring swings them over until they are arrested by the bent lever end 30 coming into contact with an abrupt edge 36 on the lever 16, Fig. 7. On the upstroke of the arm 15, the shoulder 19 lifts the the pin 21, and the spring 33 swings the connected levers back into their original position. The projection 11 has meanwhile dipped idly into and out of the needle's path. Eventually the needle 8 swings beneath the projection 11, accidental movement past it being prevented by a guard 37, and stops its downward motion. The lever end 30 is thus prevented from falling along the inclined edge 32, misses the edge 36, and allows the lever 16 to be pulled over by the spring 33. The part 42 of the lever edge raises the lever end 30 into engagement with a latch 40, Fig. 9, pivoted at 41 upon the framework, which the pin 39 on the connected levers simultaneously moves into position. The needle guard 37 is thus raised clear of the needle, which is then capable of indicating any further temporary increase in the furnace temperature. Fixed to the latch 40 is a latch 85, and, as the former is thrown into gear and renders the lever 29 inoperative, the latter is pushed over and so releases and renders operative the lever 82. The bent end 83 of this now engages the lever 86, and these operate similarly to the previously described action of the levers 29, 16. At each reciprocation of the lever 15, the lever end 83 moves along the incline 89 and, striking the edge 90, Fig. 15, arrests the connected levers, the projection 77 meanwhile dipping in the needle's path, until the voltmeter needle is arrested by the guard 78 and stops the downward movement of the projection. The lever end 83 then raises the stop 90, and is raised by the cam edge 91 of the lever 86 into engagement with the latch 85, which is moved into position by the pin 21, Fig. 17. Simultaneously the projection 77 and its needle guard are raised out of the needle's path, and the catch 40 is swung back to release the lever 29, which again begins to reciprocate the projection 11 in the path of the needle. The pin 39 of the connected levers is prolonged and acts between shoulders 48, 49 on a valve rod 44, Fig. 5, so that, when the projection 11 is engaged by the voltmeter needle and the pin 39 swings to its upper limit, the valve 92 is raised, and the space beneath the diaphragm 58 is cut off from the compressed-air pipe 93 and connected by a pipe 54 and ports 100 with the exhaust pipe 55. The diaphragm 58 falls, and the valve 61 nearly cuts off the supply of air and gas to the burners. On the furnace temperature falling, and the needle 8 consequently receding and engaging the projection 77, the pin 39 is swung over to its lowest position, and the valve 92 is dropped so as to cut off the pipe 54 from the exhaust 55 and connect it by ports 96, 100 with the compressed-air pipe 93. The diaphragm 58 and the valve 61 are raised, and a full supply of gas and air is admitted. As the furnace temperature again rises, the needle 8 swings back to the projection 11 and the fuel supply is again reduced. The temperature is thus kept within narrow limits. The levers 10, 75 are pivoted upon an arm on a cup-like support in two parts 101^a, 101^b, Figs. 5 and 41, secured together by screws. The cup is capable of being rotated by a worm-wheel segment 108 on its upper part which is actuated by a worm 107, and the levers 10, 75 can thus be adjusted to any part of the scale 9. Rests 38 are provided to support the needle when it engages a projection 11 or 77. The rests 38 may be cast together, have inner and outer flanges 111, 110, and be supported by an arm extending from a part inside the box. The arm 15 is operated by a reciprocating diaphragm 12, the compressed-air supply to which is regulated by a distributing-valve 116. A spring 119 coiled round a fixed rod or fulcrum 147, Figs. 23 and 25, engages at one end a swivelled pin 149 on the arm 15, and at the other the valve 116. On the framework is pivoted a latch 144, Fig. 35, provided with a spring 152 and having a shoulder 145 which engages a lug 146 on the valve, and so retains this in the up or down position. Fig. 28 shows the diaphragm commencing the down stroke. The compressed air from the pipe 93 passes by way of the passage 127, the ports 130, 131, and the passage 133 to the upper side of the diaphragm, the air exhausting from the underside by the passage 122, Fig. 25, and the ports 125, 126 to the exhaust pipe 57. When the arm 15 reaches the bottom of its stroke, a pin 154 on it strikes the latch arm 155, releases the pin 146, and so allows the spring 119 to snap the valve into its upper position, Fig. 23, in which it is held by the latch 144. Compressed air now enters from the passage 127, through the ports 130, 125 and passage 123, to the space beneath the diaphragm, which is thus raised. Air exhausts from the space above the diaphragm through the passage 133, the ports 131, and the passage 137 to the exhaust pipe 57. On the arm 15 reaching its upper limit, a pin 150 strikes the latch arm 151, Fig. 23, and releases the valve 116, which is forced down to its lower position by the spring. The diaphragm descends again, the valve 116 being held down by the latch until the down-stroke is completed. The speed of the air engine is regulated by the throttle screw 138, Fig. 22.

17,202. Grahn, P. J. Oct. 15, 1908, [*Convention date*].



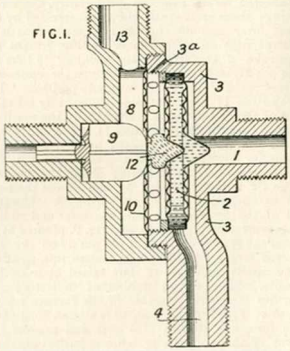
Heating buildings.—Oil or grease is collected from the surface of the water in the return tanks of steam heating or steam pressure systems by funnel-shaped collectors 12 carried by an oscillating tubular shaft 8, and is conducted through a steam-trap 22 to a receptacle 15 in communication with a second receptacle 16, in which a float is arranged to control automatically the position of the collectors 12. The float works on a grooved stem 37, and its action is regulated by means of a tap 38. When the device is applied to an open-supply tank, the float 28, Fig. 3, in the steam-trap 22 which closes the discharge opening is dispensed with.

17,475. Brougham, F. J., [*Akt.-Ges. der Maschinenfabriken Escher, Wyss & Co.*]. July 27.



Heating buildings.—In a low-pressure steam plant, such as a steam heating-plant, in which the steam is first passed through a turbine, the speed governor of the turbine controls the turbine exhaust to maintain a practically constant supply of steam for heating although variable amounts of power are taken from the turbine. The inlet and a by-pass supply pipe may also be controlled simultaneously by the governor. Steam supplied through a pipe *c* passes through a turbine *a* into the exhaust pipe *e* and to the heating-plant through a pipe *o*. If the load on the turbine falls, the consequent increase of speed causes the governor *f* to move through a rod *h* a baffle or throttling device *a* in the exhaust to increase the back pre sure. The baffle *i* never closes the pipe *i* completely. If the load is further reduced after the baffle is operated, the governor *f* operates a throttle valve *l* in the inlet, which gradually shuts off steam from the turbine, and, to maintain the steam supply to the heating-plant in these circumstances, simultaneously opens a throttle valve *n* in a by-pass pipe *m*. The valve *n* may alternatively be operated by hand or by an auxiliary motor operated by the back pressure of the turbine. If a smaller quantity of heating-steam is used during a long period of time, a number of inlet devices may be shut off in the turbine. The actuation of the throttle devices operated by the governor *f* may be direct, or by auxiliary motors, or electrically, or in any other way.

17,724. Still, W. M., and **Adamson, A. G.** July 30.



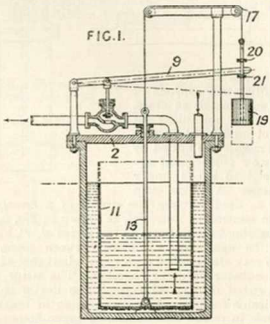
Heating buildings; steam-traps; thermostats.—In a steam heating-system in which the inlet-valve is controlled by the temperature of the outlet, the inlet and outlet valves are arranged in line with the thermostat between them, the only communication between the inlet and outlet being by way of the heating-pipes. An expansible capsule 2 is held in a casing 3, and is formed with a valve-piece adapted to close the outlet 1. The casing has an outlet 4 for water of condensation, and communicates with the atmosphere by openings 3ª. A steam-inlet valve 9 in line with the valve piece of the capsule extends into contact with a diaphragm 10 forming the inner wall of the inlet chamber 8. A block of heat-insulating material 12 is interposed between the diaphragm and the adjacent wall of

the capsule. Steam first enters the radiators at 13 and passes through the outlet 1, thereby expanding the capsule and shutting both the inlet and outlet valves. The water of condensation slightly cools the capsule and the subsequent contraction opens both valves and allows water to escape and steam to enter, whereupon the action is repeated. If desired, the inlet valve may be formed on the diaphragm itself; or an adjustable screwed piece may be fitted between the valves, in which case the chamber 8 is separated from the casing 3.

18,194. Newton, P. A., [*Farbenfabriken vorm. F. Bayer & Co.*]. Aug. 6.

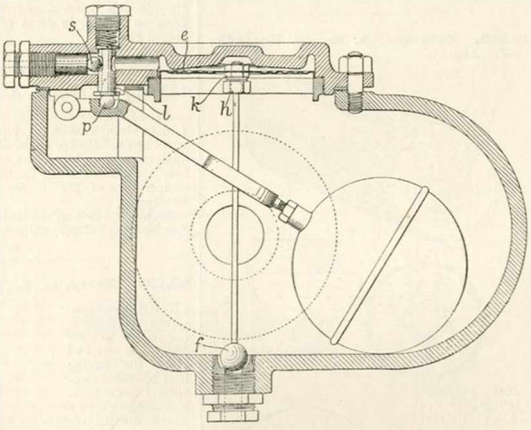
Steam-traps.—A trap of the bucket type has a removable cover 2 provided with inlet and outlet pipes, and a stuffing-box through which passes a rod 13, which is connected with the bucket 11, and with a counter-balance weight 19 by means of a cord or chain passing over pulleys; the weight carries two tappets 20, 21, which engage with a lever 9 operating the outlet valve 17, outside the trap. The supports for the lever and for the pulleys are both carried on the top of the trap.

FIG. 1.

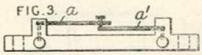


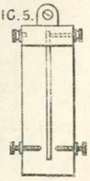
18,681. Still, W. M., and **Adamson, A. G.** Aug. 13.

Steam-traps.—A float raises a ball valve *p* to cut off steam from the upper side of a diaphragm chamber, the steam pressure on the lower side then causing the diaphragm *e* to open a discharge valve *f*; further upward movement of the float may cause a spring-controlled sleeve *l* to open a relief valve *s*, allowing steam to escape from the diaphragm chamber. The end *h* of a rod carrying the main valve is spherical in shape and is held in a recess in a fitting *k* secured to the diaphragm, the joint allowing a small movement between the parts. The float may be made of wood or cork treated with bitumen or turpentine; or a hollow steel ball covered with zinc may be used. According to the Provisional Specification, the float may close a valve in the diaphragm chamber leading to a steam-supply pipe, and an equalizing spring-controlled ball or other valve may be used, opening automatically when the pressure on one side of the diaphragm has dropped to a certain extent.



19,011. Adams, W., and **Woodward, H. E.** Aug. 18.

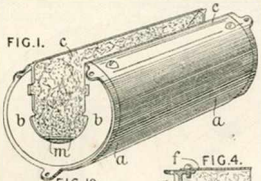


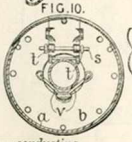


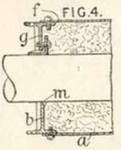
Thermostats. — A bi-metallic strip consists of two such metals as brass, silver, or an alloy of nickel and mild steel. The metals are united by silver solder, and are allowed to cool under pressure. A single strip may be used to close the circuit of a fire-alarm, or to control two circuits, as shown in Fig. 5, for registering temperature; or two strips a^1, a^{11}, Fig. 3, may be used with a contact between them. A strip may also control a valve to admit cool air to an incubator or other chamber. The strips may be twisted into spiral form. The device is also applicable for preventing overheating of bearings, for use in ovens, sick rooms, or green-houses, for controlling an electric fan, or for regulating the flow of gas or the speed of machinery.

Reference has been directed by the Comptroller to Specifications 563/79, 7643/85, 14,023/87, 1512/92, 28,343/02, *and* 12,705/08.

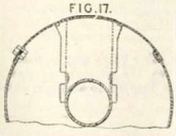
19,281. Coleman, A. B., and **Hasluck, W.** Aug. 21.



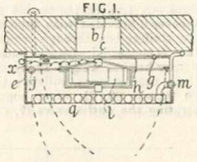




Non-conducting coverings for heat. —A cylindrical casing *a* is built up on supporting-disks *b*, and has an aperture *c* on the periphery of practically the same dimensions as the pipe &c. to be admitted. The space between the pipe and the casing is packed with non-conducting material, and the space is closed by a plate *f*. The corresponding apertures in the disks *b* are closed by plates *g* of suitable shape, with fastening-devices having a wedging action, for example, drawn up by bolts, as shown in Fig. 4, or pivoted as shown at *s*, Fig. 10. In other forms, a sliding plate is employed, for example, as shown in connexion with larger casings to protect the flange joints in Fig. 17. The outer plate may be fastened by bolts or sprung into place. To reduce conduction the pipe is supported only on wires *r*, *m* where it passes the disks *b*.



19,575. Barker, A. H. Aug. 26.



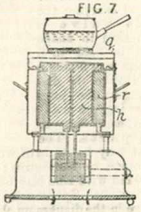
Radiators.—A radiator *q* hinged at *m* heats air which is caused by a fan *l* hinged at *j*, to circulate through side inlets *x*. Fresh air may be admitted from an inlet *b*, in front of which is mounted a hinged filter *h*.

19,696. Talmadge, J. M. Aug. 27.

Non-conducting coverings for heat.—Wood, metal, fabrics, cloth, leather, paper, asbestos, and electrical wires and fittings are rendered resistant to heat by applying a film of Tung oil, which is then converted into a solidified form by heating to a minimum temperature of 212° F. for a maximum time of 30 minutes.

Reference has been directed by the Comptroller to Specifications 2679/01, 4346/03, *and* 15,770/05.

20,639. Berry, A. F. Sept. 9.



Heat storing apparatus; non-conducting coverings for heat. — A metal block for storing heat produced electrically has a heat-insulating cover which can be removed entirely or partly to expose the exterior heat-radiating surface of the block. In the arrangement shown in Fig. 1, a block *a* has a cone with double air

insulating spaces *o*. A hole *d* is provided in the cover to enable a plain or screw-threaded shank *e* on a heating-plate *f* to be inserted in the block. A

FIG. 1.

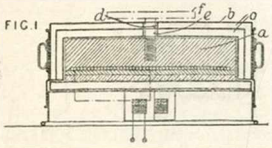
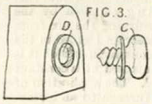


plate may be used to cover the hole. In a second arrangement the block is in sections, which can be turned about hinges to rest on separate heat-insulating supports. In the arrangement shown in Fig. 7, a block *h* is surrounded by an outer metal mass with which it makes contact when expanded by heat. In another arrangement a number of blocks form a cylindrical heater which has a hinged cover. Metal blocks may also be used for heating ovens.

20,676. Green & Co., T. G., and **King, H. W.** Sept. 10.

Hot-water bottles.—The end of an earthenware foot-warmer is formed with an opening D to receive the stopper C, which also serves as a handle.

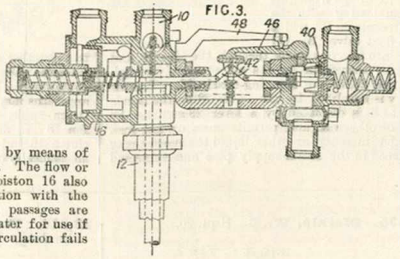
FIG. 3.



21,016. Humphrey, H. S. Dec. 26, 1908, [*Convention date*].

Thermostats.—A valve device is so fitted to a water-heater that, on the closing of the hot-water outlet on the pipe 10, a valve opens. This valve is operated by the difference in water pressure, so that water can circulate through a portion of the heater and the valve device. A thermostat 12 in the circuit controls the supply of fuel by means of links 48, 46, 42, and the gas valve 40. The flow or cessation of water acting on the piston 16 also controls the gas valve in conjunction with the thermostat. Alternative circulation passages are provided connected to the whole heater for use if the valve controlling the partial circulation fails to act.

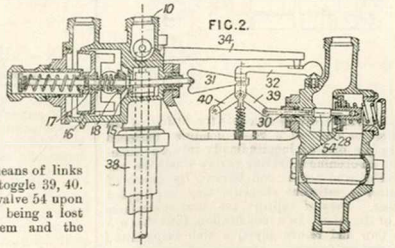
FIG. 3.



21,017. Humphrey, H. S. Jan. 15, [*Convention date*].

Thermostats.—A valve device fitted to a water-heater is arranged so that on the closing of the hot-water outlet on the pipe 10, a spring-controlled valve 18 upon the stem 17 of the pressure-actuated piston 16 opens and permits water to circulate through the heater, the port 15, and the thermostat 38. The thermostat 38 and the stem of the piston valve 16 jointly operate the gas valve 28 by means of links 34, 32, a wedge-shaped cam 31 and a toggle 39, 40. A pilot flashing device comprises a valve 54 upon the stem 30 of the gas valve, there being a lost motion connexion between the stem and the valve 28.

FIG. 2.



21,387. Doillet, L., and **Faure, P. R.** Sept. 21, 1908, [*Convention date*].

Thermostats. — In a liquid-fuel steam-generator furnace a hand or automatically operated valve controls the air supplied to the furnace burner by a fan driven by an engine supplied by the boiler, the liquid fuel being supplied by the pressure of the air from a reservoir located in the air conduit in which it is maintained at a constant level. The application of the furnace to an instantaneous steam-generator is illustrated in Figs. 1 and 2. The fan 18 is driven from the pulley 17 by a belt or chain 19, and forces air to the burner through a conduit communicating with the fuel receptacle 22, which has a float valve 23. Oil flows into this receptacle through the pipe 24, and is forced therefrom by the air pressure, through the pipe 25, to the spraying-nozzle 26. The air supply is regulated by the valve 28 on the nozzle 27, which is displaced by a lever 29 actuated by hand or otherwise, and permits more or less loss. A water, mercury, or other liquid thermostat may be placed in the steam-supply pipe and connected to a chamber containing a diaphragm, which operates the valve 28. When the boiler is of a type containing a large volume of water, the pressure apparatus may be connected directly to the boiler steam space. Normally, the pulley 17 and the fan 18 are driven by the engine 8 through the clutch 16, but they may be independently driven mechanically or by hand, to raise steam initially.

FIG. 1.

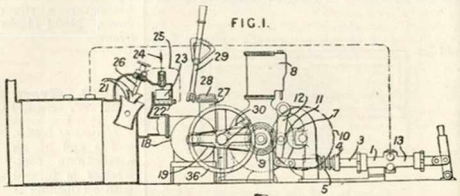
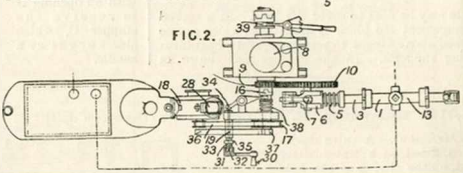
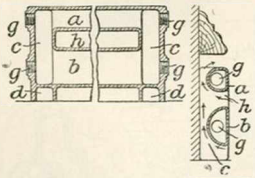


FIG. 2.



21,435. Meikle, W. C. Sept. 20.

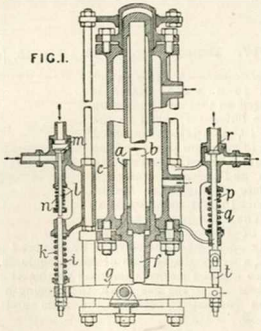
FIG. 3. FIG. 2.



Radiators.—Heating-elements for fitting in the skirtings or dado of a room comprise flattened metal pipes divided longitudinally into two tubes *a*, *b* by an opening *h*, leaving parts *c* which are not so divided and act as end boxes. By means of apertures *g*, adjacent elements may be nippled together. Feet *d* support the heating-surfaces clear of the floor. In a modification, the tubes *a*, *b* form flow and return pipes, a web being fitted across the end boxes *c*.

23,314. Fromme, O. Oct. 27, 1908, [*Convention date*]. [*Addition to* 2488/09.]

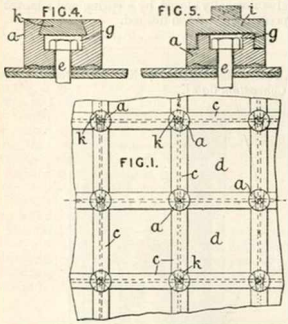
FIG. 1.



Thermostats.—In a development of the method of, and means for, controlling the supply of feed water to steam-generators of the flash type, as

described in the parent Specification, a single thermostat *a*, *b*, *c* is adapted to control two independent valves *m*, *r*, each of which constitutes a by-pass valve located between the pressure and suction sides of a mechanically driven feed-pump. Steam from the generator is admitted to the casing *c* to act upon a copper tube *b* free to expand at its closed upper end only. The linear expansion or contraction of the tube is communicated to arms *i*, *t* adapted to engage the valve spindles *l*, *p* through the medium of a non-expansible carbon rod *b*, plunger *f*, and rocking lever *g*, a spring *k* being provided for keeping the parts *f*, *g* in contact. In the position shown, both valves are held to their seats by their springs *n*, *q*, indicating that the steam temperature has risen to a certain limit and that both feed-pumps are in operation. As the temperature falls, the tube *b* contracts, and the valve *r* is pulled from its seat by the arm *t*, which is connected to the valve spindle by means of a pin and slot. The valve *m* is not raised from its seat by the arm *i* until a lower limit of temperature is reached.

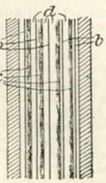
23,539. Sauerbeck, L. Oct. 14.



Non-conducting coverings for heat. — Roofs, ceilings, walls, ventilating-pipes, &c. are lined with interengaging slabs *d* of asbestos or other damp-proof material secured in place by hard rubber or like roses *a*, arranged at the meeting angles of the slabs and fitting over the ends of butting strips *c* of similar material to the slabs covering the joints. The roses *a* are formed with a recess *g* to receive the heads of the screws or nails *e* by which they are secured to the rafters. The recess *g* is filled with packing-cement before inserting the screw head and is covered with a wedge-shaped piece *k* inserted in a tapered slot in the upper surface of the rose or by a screwed-on cap *i* to prevent moisture from reaching the screw. The bearing-surface of the rose is grooved to receive asbestos or rubber cement. Ventilating-pipes may be lined on both sides, the screw bolts being carried right through.

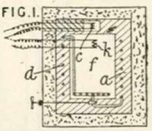
23,761. Brousse, E. Oct. 19, 1908, [*Convention date*].

Non-conducting coverings for heat.—A heat-insulating device consists of alternate layers of brilliant polished metal surfaces *b* and sheets of non-conducting and preferably dark material *c*, such as felt, cloth, blackened cork, &c., air spaces *d* separating the individual layers. The metal plates may be only brilliant on one face, the other face being provided with a coating which does not conduct heat and does not reflect light. The air spaces may be filled with porous non-conducting material.

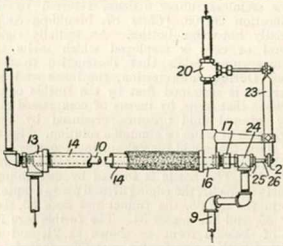


23,818. Bell, G. G., and **Pletts, J. St. V.** Oct. 18. [*Addition to* 22,598/08.]

Heat-storing apparatus.—In the electric water-heater described in the parent Specification, the hot-water or steam pipe-coil *d*, which is embedded in a block of iron or other heat-storing material *a* heated by an electric resistance *c*, is continued outside the block of iron &c. into a chamber *f* for cooking, or for heating air or other media. The chamber may be formed either inside or outside the block of iron &c.



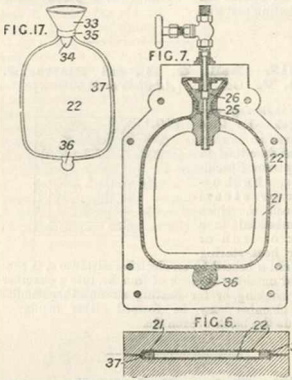
23,881. Madsen, G. C. Oct. 18.



Thermostats.—A water-heating device comprises a water-pipe arranged inside a steam-pipe, a fitting to which both pipes are fixed at one end, and means

whereby the expansion or contraction of the water-pipe operates a valve controlling the steam supply. A water-pipe 10 of copper or brass is arranged within a lagged steam-pipe 14 of iron, both pipes being fixed at one end to a fitting 13. The water-pipe extends at the other end through a fitting 16 and stuffing-box 17 into a T-joint 24 connected with the water-inlet pipe 9. The T-joint is otherwise closed by a plug 25, which is connected to a valve 20 in the steam-inlet pipe through the medium of a rod 26, an adjustable disk 27 on the rod, and a lever 23, which is adjustable on the valve-rod. The expansion or contraction of the water-pipe therefore effects a diminution or increase of the steam-supply,

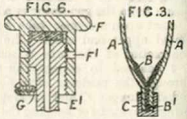
23,887. Gleason, F. J. Oct. 29, 1908, [*Convention date*].



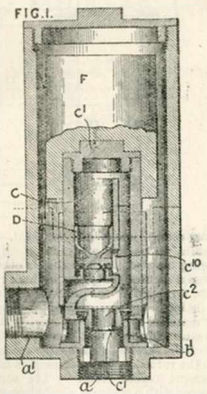
Hot-water bags.—Relates to the process of making hollow seamless rubber articles, referred to in Specification 261/08, [*Class* 87, Moulding &c.], especially hot-water bottles. An initially rigid mandrel or core is employed which melts at a temperature below that destructive to the rubber. During vulcanization, the inner wall of the article is sustained first by the fusible core, and, when that melts, by means of compressed air or by internal fluid pressure produced by the vaporization of water or ammonia solution. Figs. 6 and 7 show the mould for vulcanizing together the parts forming a hot water bottle, such as that shown in Fig. 17. The bottle is formed by assembling two main strips 22, the edging 37, and pieces adapted to form the tab 36, the funnel and neck 33, the collar 35, and the pieces 34. The fusible core is made of skeleton form, as shown at 21, and is associated with a non-fusible part 26, adapted to mould the funnel, and with another non-fusible piece 25, which constitutes the nipple of the finished bottle and becomes connected to the rubber during vulcanization.

24,542. Blick, G. H. W., and **Moseley & Sons, D.** Oct. 26.

Hot-water bags.—In order to apply a V-shaped guard-strip B evenly to the sides A of the seams of an india-rubber receptacle, particularly a hot-water bottle, it is formed with a solid and integral fin B^1, the parts then being pressed and vulcanized together, so that the fin forms an integral part of the seam. The seam may be covered by a strip C as usual. The fin need not extend as shown to the outside edge of the seam. The invention is described in connexion with a hot-water bottle having a closable air-vent external to the pouring-cone. Fig. 6 shows a form of air-vent comprising a tube E^1 of metal, vulcanite, &c. fitted with a screw cap F, which is unscrewed to permit air to escape through ports F^1, but is provided with a screw G to prevent removal. Alternatively, the vent tube may be provided with a cock or tap, or a valve normally closed by a spring and adapted to be pressed open when desired.



24,941. Gebhardt, E. F. Oct. 30, 1908 [*Convention date*].

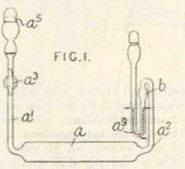


Heating buildings.—In a hot-water heating-system, a pressure-regulating valve, as shown in Fig. 1, is fitted, communicating with the system by an aperture *a*, and with the expansion or overflow tank by a connexion a^1. The weight F keeps the main valve C upon its seat b^1 until a predetermined

pressure is reached. A depending lip C^1, fitting loosely within the valve seat b^1, ensures the full rising of the main valve. If a vacuum occurs in the system the water in the tank returns through the connexion a^1 and forces a small valve D, carried by the main valve, to lift and allow the liquid to re-enter the system through openings c^{10}, c^2 in the valve C.

25,254. Rorke, T. J., and **Rorke, E.** Nov. 2.

Thermostats.— A thermostat may be set to any desired temperature by varying the contained mass of expansive liquid while keeping its volume constant. In the form shown, a vessel a has at its ends tubes a^1, a^2, one of which has a stop-cock a^3 and an enlarged portion closed by a cap a^5, the other tube being connected with a U-tube a^9 containing mercury to close electric circuits at the maximum and minimum temperatures. The thermostat is set by opening the stop-cock a^3 and heating the liquid in the vessel a to the required temperature, when the cock is closed. The U-tube has a bulb b to prevent passage of mercury to the vessel a. The vessel a may be replaced by a coiled tube placed vertically; and the tubes a^1, a^2 may be connected by means of a tube. Specification 9481/08 is referred to.

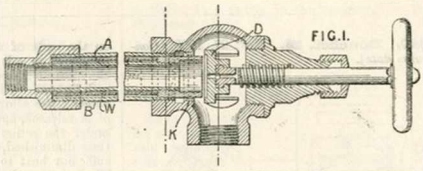


25,301. Buchan, C. Nov 3.

Foot-warmers.— Stoneware foot-warmers or hot-water bottles A are made with a lip a surrounding the aperture for the stopper b to facilitate filling.

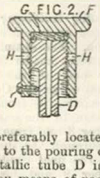
25,890. Barton, J. W. Nov. 9.

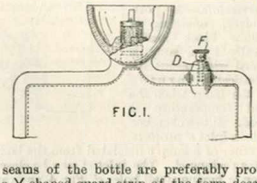
Steam-traps.—A steam-trap has an outer expansion tube B carrying a valve D co-operating with a seat on an inner tube A, the coefficient of expansion of the inner tube being greater than that of the outer tube, and the length and coefficient of expansion of the outer tube being in proportion to the area of the valve opening, so that the trap will discharge to a vacuum or to a partial vacuum. The trap works normally under a vacuum, the steam and air between the tubes being withdrawn by a pump, so that no heat is conducted from the inner to the outer tube; if the vacuum is cut off, steam passes through ports K to the space between the tubes and expands the outer tube, so that the valve opening is increased to compensate for the loss of head due to the rise in pressure on the discharge side. A tube W may be placed in the dead-air space.



26,084. Moseley, O. G., Blick, G. H. W., and **Moseley & Sons, D.** Nov. 11.

Hot-water bags. — A valve device for permitting air or steam to escape during the filling of india-rubber and like hot-water bottles is provided with a screw-cap, which, while permitting the valve to be opened and closed, is normally irremovable. The device is preferably located in the top of the bottle external to the pouring cone. The cap F screws over a metallic tube D incorporated with the bottle, and, by means of packing G normally prevents air or steam from escaping through ports H in the cap. A set-screw J, pin, or its equivalent prevents the removal of the cap.



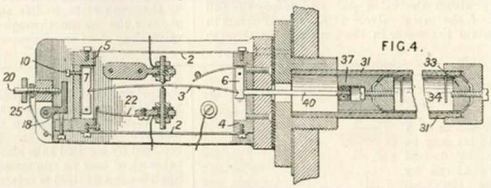


The seams of the bottle are preferably provided with a Y-shaped guard strip of the form described in Specification 24,542/09

26,819. Geissinger, H. G. Nov. 30, 1908, [*Convention date*].

Thermostats.—A thermostat has three flexible strips 2, 2, 3, the middle one of which is arched to engage one of two contacts. The middle strip 3 rests at one end in a groove in a block 6, which in one arrangement is fixed to a block 4, but in the apparatus shown in Fig. 4 is pivoted, and at the other end the middle strip rests in a groove in a pivoted block 7, a screw 10 being provided for giving an initial adjustment to the strip 3. The block 7 is carried by a block 5 which connects the movable ends of the outer strips 2, and has a lug carrying a screw engaging with a lever 18. An adjustment screw 20 engages this lever, and movement by vibration is prevented by a nut carrying a spring 25. The block 5 is guided by a spring plate and by a spring 22. In one arrangement, the parts so far described form the thermostat, the middle flexible strip 3 having a different coefficient of expansion from the others, and the end block 6 being a fixture. But in the form shown, the block 6 is connected by a rod with a second thermostat which may be placed in contact with the heading or cooling medium, and may act in series with the thermostat members 2, 3 or differentially. It may consist of an outer tube 31 and an inner tube 34 having different coefficients of expansion and connected together at one end by flanges, a conical wedge 33, and an end cap. The other end of the inner tube is connected by a conical wedge with a plug 37 carrying the rod 40. Contact between the tubes is made by slitting the inner tube or by filling them with a heavy oil. The tube thermostat may be caused to act alone by making all the flexible strips 2, 2, 3 of the same coefficient of expansion.

FIG. 4.



27,540. Bouchet, M. Nov. 27, 1908, [*Convention date*].

FIG. 4

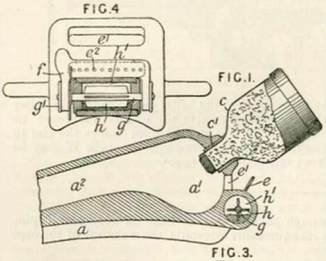
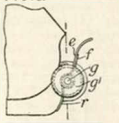


FIG. 1.

FIG. 3.

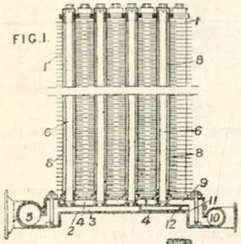


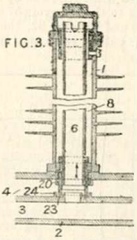
Thermostats.—A port-vulcanizer, consisting of a hollow block heated internally by a lamp, is provided with means for automatically turning down the lamp when the desired temperature is attained. Into a chamber a^1 with air inlet e^1 projects the burner of a lamp c insulated from the body by asbestos packing c^1. The inlet e^1 may be closed by a screen e having small holes e^2, Fig. 4, and carried by arms f turning frictionally on milled studs g^1 on the ends of a shaft g carrying vanes h partly immersed in alloy in a chamber h^1. In operation, the screen e is drawn back, and the lamp is inserted and lighted. When the required temperature is reached, the alloy melts, the shaft g with its studs g^1 is released, and the screen e closes the inlet e^1 under the action of a spring r. The air supply is thus diminished, and the lamp burns low, giving sufficient heat to keep the temperature constant. The lamp is of such capacity that it burns out at the end of the operation. Other means may be employed for releasing the screen, such as a bar which, on expansion, releases a catch or a pressure gauge for the same purpose. If tyres are to be repaired off the wheel, they are clamped on a curved base-plate to retain their original curvature.

27,684. Bracq, G. Nov. 27.

Heating buildings; radiators.—Field tubes 1 are mounted upon collectors 2 preferably in staggered relation. The chamber 3, in connexion with the steam inlet header 5, distributes the steam to the upper end of the vertical pipes by means of internal tubes 6. Condensation water collects in the chamber 4 from the annular spaces 8. An extension of the chamber is on a level with the chamber 3 and from this any steam not condensed rises through the inner tubes 6 of a second set of tubes, the final condensate being collected by the chamber 9 and header 10. Water from the chamber 4 discharges by an aperture 11 past a

water-seal 12. The outer tubes 1 are secured by the screwing of the inner tubes 6, thus drawing up

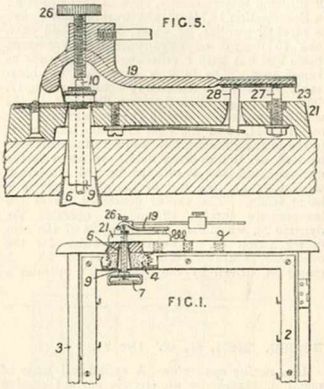




a collar 20. A water-seal 23, 24 prevents the direct escape of steam from the chamber 3 to the chamber 4 when the collar is in position.

27,909. Hearson, C. E. Nov. 30.

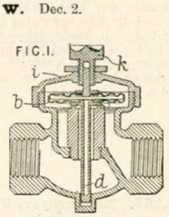
Thermostats.—An incubator for cultivating bacteria &c. is heated by the passage of a current through resistance wiring, arranged in two or more alternating coils or sections, wound around a chamber with connexions such that the current may be caused to pass through some or all of the circuits in series or parallel, and such that the circuit may be changed from parallel to series by the action of a thermostat of the type described in Specification No. 13,178/91. A copper chamber is secured by a flange 2 to wooden casing 3, the space between being filled by packing 4 of sawdust or slag wool for high temperatures. Two apertures are provided in the chamber and casing, one for the reception of a thermostat 7, the other for a thermometer. The thermostat 7 is provided with a rod 10, enclosed in a tube 9, which is adjustably secured to an earthenware base 21, and which engages a screw 26 in a lever 19. The lever 19 is provided with an insulated circuit-closer 23 engaging a fixed contact 27 and a spring stop 28, which are respectively connected to tubular terminals in the base 21, and thereby to the resistance circuit or circuits wound around the chamber. For high temperatures, the thermostat



is placed in a cavity in the packing 4 or in the wood casing 3.

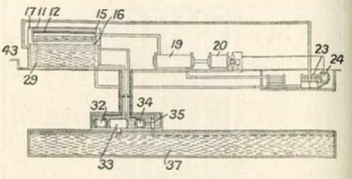
28,154. Geipel, W. Dec. 2.

Steam-traps.—An expansible capsule containing a volatile liquid has a communicating hollow stem, which is influenced by the steam or water before it passes the discharge valve and comes into contact with the capsule. As shown in Fig. 1, a stem projects into the inlet of the trap, and, when water collects, the liquid in the capsule contracts sufficiently to allow the valve to be opened by the pressure of the water. A valve *b* in the form of a flat metal ring is carried by the capsule and has vanes causing the valve to rotate when lifted from its seat. The trap body has a cover *i* carrying a hollow screw *k* for adjusting the trap. In a modification, the stem projects upwards and is guided by lateral supports in the inlet passage.



28,577. Fessenden, R. A. March 8, [*Convention date*].

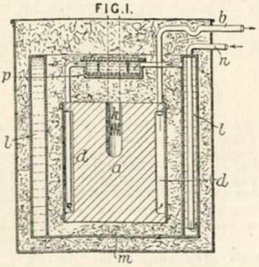
Solar and natural heat, utilizing.—In a system of utilizing radiant energy, such as that described in Specification 14,745/07, the working fluid, such as alcohol, gasoline, or water, is contained in a tank 15 formed of ferro-concrete and covered inside and out with a reflecting-material, such as tinned iron. The tank is supported on heat-insulating bricks 16 within a reflecting-covering 17. Salts of iron or black dyes are dissolved in the working medium to absorb the sun's rays. The coverings 11, 12 of the tank are made transparent to the solar radiations, but opaque to the radiations emitted by the working fluid. If water is the working fluid, this is effected by adding a small amount of an iron salt to the glass while it is being made. The vapour generated drives the low-pressure turbine 19 and so operates the dynamo 20, which drives the motor 24 of the condenser pump 23. The cooling-water for the condenser is drawn from the reservoir 29. A motor 34, driven by the dynamo 20, operates a pump 35 which raises water from the reservoir 37, sunk to a considerable depth, to the reservoir 29. By these means, the sun's energy is stored, and can be utilized when required by allowing the water to flow back to the reservoir 37 and drive the Pelton wheel 33 and dynamo 32, the leads 45 from which allow the energy to be used where required.



30,089. Bell, G. G. Dec. 23.

Heat-storing apparatus.—A cylindrical mass of metal *a*, heated by an electric current passing through a coil *h*, gives up heat to water or other fluid circulating through an external chamber *d*. The liquid to be heated passes from a pipe *n* to a preliminary heating-chamber *l*, whence it flows through a precipitating-chamber *p*, and thence to the heating-chamber *d*, whence it is discharged through a pipe *b*. A metal plate *m* transmits any heat leaking downwards to the chamber *l*. The apparatus is packed with insulating-material. Modifications are described in which the part *a* is provided with fins projecting into the chamber *d*. The water in the chamber *d* may be caused to circulate in passages formed in the part *a*.

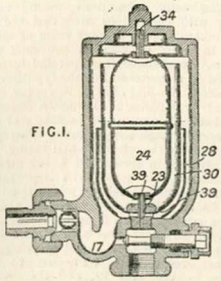
FIG. 1.



30,385. Leuthesser, F. W. Dec. 29.

Steam-traps.—A float 24 is surrounded by two stationary cups 30, 28. Water entering by a passage 17 passes over the edge of the outer cup 28, and from this can escape directly by the discharge valve 23 when the float rises; water enters and leaves the inner cup 30 through restricted openings 39, so that the float can only rise and fall slowly, noise being thus avoided, and oil is excluded from the inner cup. The float has an opening 34 at the top, and the valve 23 is tubular to allow the escape of air. The cover of the trap can be removed to permit access to the valve.

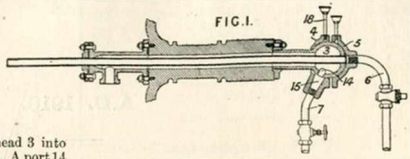
FIG. 1.



30,501. Nuttall, J. Dec. 30. [*Addition to* 7111/09.]

Steam-traps. — Steam-heated cylinders having inlet and outlet means of the kind described in the parent Specification and in Specification 19,285/09, [*Class* 99 (i), Pipes &c., Joints &c. for] are provided with means for the outlet of condensation water at regular intervals. The apparatus shown is of the kind in which the steam passes in by a pipe 6 through a head 3 into which the exhaust steam and water passes. A port 14 in the head is so proportioned that during only a part of each revolution, it connects with a chamber 15 leading to a valved outlet pipe 7. A like steam-trap device may be applied to cylinders &c. in which the inlet and outlet of fluid are effected at opposite ends, or in which they are effected through the same cover 5 of the two bearing-covers 4, 5. Lubricating cups and stems 18 are provided.

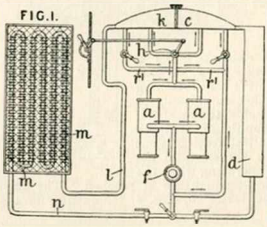
FIG. 1.



30,523. Petz, L. Dec. 30.

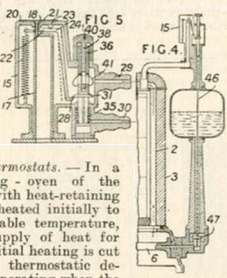
Heating vehicles.—Relates to heating systems for motor-cars of the kind in which the circulating water of the internal-combustion engine is used to heat the car, and comprises an arrangement of pipes and valves such that five different circuits are provided for the circulating water. Fig. 1 shows the system diagrammatically. The various circuits are arranged as follows :—(1) By a suitable setting of the valves, the water can be caused to circulate through the cylinder jackets *a*, chamber *c*, ordinary cooling radiator *d*, pump *f*, back to the cylinder jackets. (2) The circuit comprises the jacket *a*, chamber *k*, car heater *m*, the pump *f*, the radiator being cut out of the circuit entirely. (3) The water may be made to circulate through the radiator and heater in parallel, the relative flow in each being regulated by the position of the cock *h*. (4) The water can be made to pass first to the radiator *d*, along the pipe *n* to the heater, and then along the pipes *l*, r^1, to the pump and jackets. (5) The flow can be reversed, in which case the water passes in series through the heater first and then through the radiator. The chambers *c*, *k*, at the top of the apparatus are provided to ensure that all the pipes are full.

FIG. 1.



A.D. 1910.

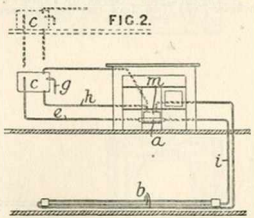
17. Stein, A. Jan. 1.



Thermostats. — In a cooking - oven of the kind with heat-retaining walls heated initially to a suitable temperature, the supply of heat for the initial heating is cut off by thermostatic devices operating when the cooking-temperature is reached. The thermometric device 15, Fig. 4, for cutting off the oil supply to the oven 2, 3, is shown also in Fig. 5 adapted for cutting off the gas supply to a similar oven. It consists of a gas cut-off valve 31 in a casing 15 provided with connexions 29, 30 to the gas-main and gas burner respectively, and comprises a tube 17 of metal with a larger coefficient of expansion than the metal of the casing 15. When the tube 17 is fully expanded, a spring lever 24, mounted between the knife-edge bearings 22, 23, moves its lower end 28 away from the valve 31, which is then pressed down by the spring 35 so as to cut the connexion between the nipples 29, 30. The oil valve 47, Fig. 4, is similarly actuated by the rod 46. The valve 31 has a hollow shank 36 fitting on a pin or shank 38 formed in a movable cap 40. The shanks 36, 38 are connected by a spring 41, by means of which the valve 31 is lifted when it is desired to re-set it. When cool, the tube 17 is connected to the atmosphere by a small tube 18 and a perforation 21 in the diaphragm 20, but when the device is hot the tube 18 presses against the diaphragm and is closed.

1580. Atkinson, J. H. Jan. 21.

Heating by circulation of fluids.—In a cooling or heating system particularly applicable for cooling the cylinders of internal - combustion engines, a cistern open to the atmosphere is placed above the source of heat, and an overflow pipe is situated just below the level of the outlet from the flow pipe. A cooling-tank or radiator is situated below the source of heat, and is connected to it and to the cistern. Fig. 2 shows the invention as applied to a heating-system for warming a room at a lower level than the source of heat, in this case the fire-place of a kitchen range. The heated water from the tube *a* expands through the flow pipe *c* and enters the cistern *c*, the level in which is kept constant by an overflow pipe *g*. The difference in pressure in the pipes *h*, *i* causes a circulation to be maintained through the radiator pipes *b*. The water



passes through the range boiler *m* on its passage between the cistern *c* and the radiator pipes *b*.

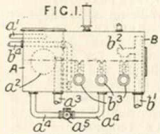
1909. Deprez, O., and **Richir, A.** Jan. 25. *Drawings to Specification.*

Thermostats.—The temperature of the air supplied to a carburetted-air lamp or stove may be automatically controlled by a thermostat comprising a bimetallic strip, the free end of which is arranged to turn a butterfly valve controlling the admission of cold air to mix with the heated air.

1964. Gould, W., and **Gould, H. W.** Jan. 26.

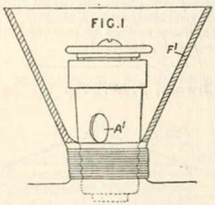
Heating buildings. — By discharging the water from the boiler into the distributing-tank at a point above the level of the water in the tank, the circulation throughout a low-pressure system is improved, and the pipes, radiators, &c. may be installed below the level of the boiler. A feed-tank A, provided with an inlet pipe a^1, a valve a^2, and an overflow pipe a^3, communicates with a distributing-tank B through a pipe a^4 fitted with a non-return valve a^5. Water from the boiler is discharged into the tank B through the outlet b^2 of a pipe b^1 leading above the level of the water in the tank. The water is distributed by pipes b^3 and returned to the boiler. The pipes b^3 may be separated by partitions. An overflow pipe b^4 is arranged communicating with the bottom of the tank B. The tanks A, B may be separate, or the tank A may be dispensed with, the tank B being supplied direct.

FIG. 1.



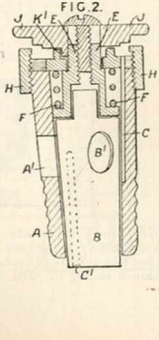
2136. Schutze, F., [*trading as* Schutze & Co., F.]. Jan. 27.

FIG. 1

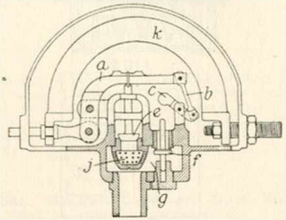


Hot-water bags are provided with a funnel and a two-way plug valve to afford a water inlet and air outlet simultaneously. A plug valve B, Fig. 2, has an orifice B^1 to register with a water-inlet A^1 in a casing attached to a funnel fitting F^1, Fig. 1. An air outlet is provided by a groove C^1, Fig. 2, in the plug valve and another groove C in the casing, which grooves register when A^1 and B^1 register. The valve is turned by a rubber or like handle J attached to a spindle E, which is pressed down by a spring F to engage a square on the valve. The upper end of the spring F engages a screw cap H provided with slots to limit the travel of a key K^1 attached to the handle J.

FIG. 2.



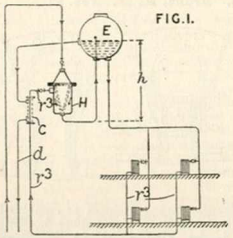
2999. Fassbender, H. Feb. 7.



Steam-traps.—A curved expansion bar *k* acts through a lever *a* on a main valve *e*, and on another valve *f* to discharge sediment which collects in the chamber *g* below the main valve. As shown, the main valve spindle is suspended from the lever *a*, while the valve *f* is operated after the main valve by a tappet *c*, connected by a link *b* with an extension of the lever. A strainer *j*, perforated at the sides only, protects the main valve. The valve *f* is normally closed by the pressure in the chamber *g*.

3611. Junk, J. Feb. 14.

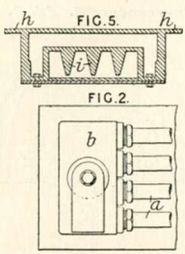
FIG. 1.



Heating buildings.—In a hot-water circulating-system, steam is introduced into a direct-contact heater H, the pressure lifting the water therein past a non-return valve to the expansion tank E. Condensation then takes place in the vessel H, drawing the return water from the radiators through the pipe r^3, whereupon the

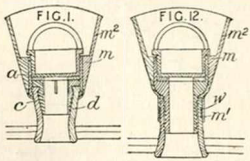
operation is repeated. The excess water due to the presence of the condensate returns to the steam boiler through the pipe *d*. A small condenser C is provided for the excess steam in the expansion vessel.

4324. Partridge, E. H. W. Feb. 21. [*Cognate Application*, 17,457/10.]



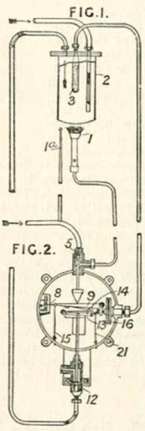
Foot-warmers. — Exhaust gases from the engine of a motor-car are led into a suitable junction-box or header *b* which communicates with another similar header or the atmosphere by means of parallel tubes *a* or passages. When passages are employed, the apparatus comprises a single casing, from the top or bottom of which ribs *i*, Fig. 5, extend, such ribs stopping short of the two ends, forming spaces to act as headers. As shown in Fig. 5, an outer casing *h* may form a water jacket.

4486. Cross, A. H. Feb. 23.



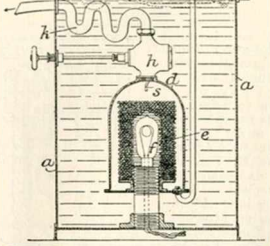
Hot-water bags.—Relates to combined funnel and stopper fittings for rubber hot-water bags &c. of the kind described in Specification 16,424/08. The lower part of the rubber funnel m^2 is moulded closely to the outer metallic part *a* of the stopper fitting and may have a downward extension m^1, Fig. 12, which serves to cover the wire binding *w* when that means of affixing the plug is used. As shown in Fig. 1, the rubber neck *d* is clamped between two parts *c*, *a*, which screw one into the other.

4775. Cartault, P. J. Feb. 25.



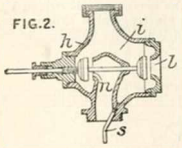
Thermostats.—In apparatus for sterilizing water by heating, in which means are provided for regulating the supply of gas &c. and the outflow of water according to the temperature of the sterilized water, the heating-chamber 2 contains a capsule 3 in connexion with an aneroid diaphragm 16 carrying a lever 9, which operates against a spring 15 to close the gas-valve 5 and to allow the discharge valve 12 to open against the pressure of a spring 21 when the temperature rises. When the temperature falls, the lever 9 allows the gas valve to open, and, through a spring 14 and lever 13, closes the water outlet. An index 8 is provided, and an atmospheric burner 1 with capillary orifices to prevent back-firing, and a by-pass 1^a, are used.

4790. Ewart, J. W. Feb. 25.



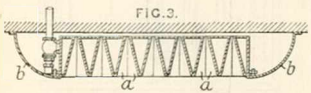
Heat-storing apparatus.—An electric lamp or other heater *f* is enclosed by and communicates its heat to a mass of iron, for example a coil *e*, within a casing *d*. The whole is submerged in

a reservoir *a* supplied with water. A valve device *h* regulates the dripping of water on to the heated coil *c* by way of the aperture *l* and



tube *s*. The steam thus generated rises through the aperture *n* and mixes with and heats the water entering at the orifice *l*. The heated water is discharged through the pipe *k*.

5245. Thomerson, C. March 2.



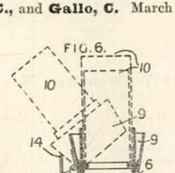
Radiators.—A hot-water or steam radiator *a* for hospitals and other institutions has a casing *b* attached to each side and the top, to cover the flow, return and air pipes and the controlling-valves to prevent unauthorized interference. The sections of the radiator are formed approximately triangular in cross-section.

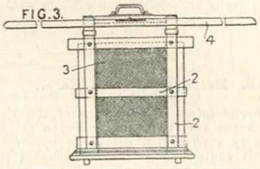
5253. Haylock, R. H., Pochin, F. H., and **Pochin, H. S.** March 2. *Drawings to Specification.*

Heating buildings.—The medium used in a circulation system for heating is the condensate obtained from the steam-traps of a steam plant. After circulation, the water is used as feed for the steam-generator. The force of the discharge from the traps is utilized to promote circulation.

5386. Ferrari, C., and **Gallo, C.** March 3.

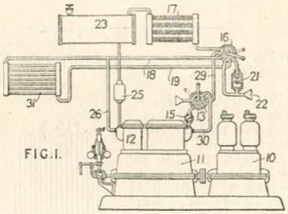
Bed-warmers.—A heating and vaporizing appliance to be placed in a bed to promote perspiration comprises a wooden cage 2, Fig. 3, provided with supports 4 for the sheets and having a perforated metal lining 3 containing a lamp which has a reservoir 5, Fig. 6, shaped as shown to retain the liquid when tilted, two burners 6, perforated annular parts 7 surrounding the burners, and annular tanks 8 for the





liquid to be vaporized. The tanks 9 carry caps 10 of metal netting, which completely encloses the flame. The tanks 9 and caps 10 may be tilted upon a rod 11 against a stop 14 for lighting the lamp, and fall back into place automatically.

6541. Knight, C. D., and **Lum, W. O.** March 17, 1909, [*Convention date*].

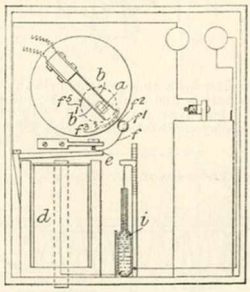


Heating buildings.—Relates to a system of heating or cooling by circulation of air, the heat being that of compression and the cooling effect being derived from the expansion of compressed air. The compressor 11 is shown as driven by a gas-engine 10. To start the system, the valve device 13 is set to the position shown in dotted lines, and if the circulation of cold air is desired, the valve device 16 will be as shown in full lines. Compressed air from the reservoir 23 now passes through the cooler 17 and the pipes 29, 30, and operates the compressor as a motor until the engine 10 starts. The valve 13 is then moved to the position shown, and the compressed air is delivered through the valve 15, pipe 29, valve 16, and cooler 17, to the tank 23. A valve 25 is arranged so that surplus air passes into an expanding-cylinder 12 on the compressor shaft, and is exhausted through the pipe 26 at a low temperature. The cool air is then circulated through the piping system comprising a radiator 31, returns to the valve 16 and escapes at 22. If it is desired to raise the temperature of the room &c., the valve 13 is moved to the

starting-position, but the valve 16 will be moved after starting to the position shown in dotted lines. Hot compressed air is now delivered through the pipes 29, direct to the pipes 18 and radiator 31, returning through the pipe 19, valve device 16, and blow-off valve 21 which may be arranged to keep a definite pressure in the system. The valve devices 13, 16 are operated by electro-magnets the current being controlled by thermostats so that the whole system when once set will operate automatically. In a modification, the compressor is driven by an electric motor the starting-valve 13 being replaced by a suitable switch.

6719. Bridge, E. A. March 17.

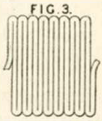
Thermostats.—In apparatus of the kind in which the variations in level of a column of mercury *i* effect the closing or opening of a circuit containing an electro-magnet *d*, the armature *e* of which controls clockwork mechanism which closes or opens a main circuit, a rectangular contact member *a* is mounted on one of the spindles of the clockwork between spring contact-blades *b*, b^1 in the main circuit. The armature is connected to an anchor f^3 through an arm *f*, weight f^1, and pin f^2; at each movement of the armature the anchor releases a wheel f^5, which is mounted on the same spindle as the contact-member *a* and makes a quarter-revolution, thus making or breaking the main circuit. The main circuit may automatically control a fan or other apparatus.



6799. Kutzer, H. March 17, 1909, [*Convention date*].

Non-conducting coverings.—Threads of glass-wool are used as insulating packing and are arranged parallel to each other to cover a rectangular side. A rope made of many threads may be doubled as shown; or, for a circular side, the rope may be wound spirally.

FIG. 3.



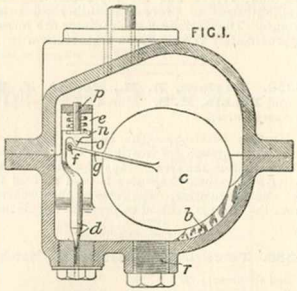
7480. Pearson, G. H. March 26.

Steam-traps.—A float *c* has a wide arm *g*, which engages with an extended knife-edge *o* forming part of an overhanging projection *n* of the spindle of a tapered discharge valve *d*, the valve and the knife-edge being in the same vertical plane. A pin *p* on the spindle passes through a hole in a stirrup *e*, which forms part of the casing, and supports a hinge-pin *f* on the float lever. The casing has ribs *b* for supporting the float. A gravity or thermostatic discharge trap may be attached at *r*, to open when steam is cut off; it may be placed in a recess below the casing.

(*For Figure see next column.*)

7480.

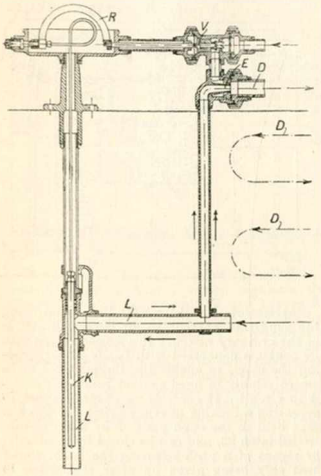
FIG. 1.



7847. Weiniger, K. April 2, 1909, [*Convention date*].

Heating buildings; thermostats.—In systems of heating by circulation of a mixture of air and steam, the inlet of steam is regulated by a thermostat R actuated by the expansion of fluid in a vessel K situated in the tube L for the inlet of air. Steam entering from the valve V draws in, and mixes with, air at the injector E, the mixture being circulated. The thermostat R is only actuated when the radiators

&c. D are so heated that practically no condensation takes place, whereupon the surplus steam

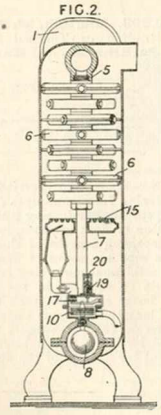


finds its way into the tube L, which is open to the air.

8526. Glover, T. April 8.

Thermostats. — In a gas-heated water-containing radiator, the supply of gas is controlled by a thermostat, the air-bulb 8 of which is in the current of water returning from the sections 1 to the boiler 6. The varying air pressure in the bulb operates, by means of the expanding disks 10, a gas valve 17, which may be adjusted by a spring 19 and screw 20.

FIG. 2.



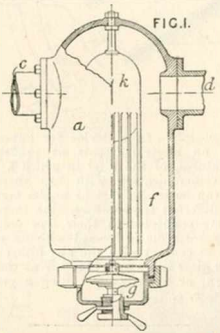
9137. Richards, A. T. April 15.

Bed-warmers. — A casing *c* protecting an electric lamp *e* fits into an aperture *b* in the rigid casing *a*. The appliance may be filled with water through the stoppered opening *k*, or may be used without such filling.

FIG. 1.

9214. Weiniger, R. April 15, 1909, [*Convention date*].

FIG. 1.



Steam-traps. — In heating systems, particularly those in railway carriages, a device *a* for draining the water of condensation is fitted with a central body *k* deeply grooved. The upper part is in the path of steam passing from tube *c* to tube *d*, and heat will be conveyed to the lower part, which is immersed in the water of condensation collected in the space *f*, thus preventing freezing of this water in cold weather. An outlet valve *g* may be operated thermostatically or by hand.

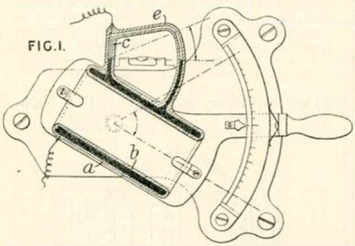
9350. Fournier, J. B. April 19, 1909, [*Convention date*].

Thermostats, as described in Specification 18,507/05, have the sensitive liquid S separated from the liquid l^1 in the indicating-element by a substance C chemically or physically inert to both. In addition, the reservoir B for the sensitive liquid may be formed in straight, spiral, or like form as a continuation of the flexible transmission tube *l*.

FIG.4.

9364. Bourck, F. E. April 18.

FIG.1.



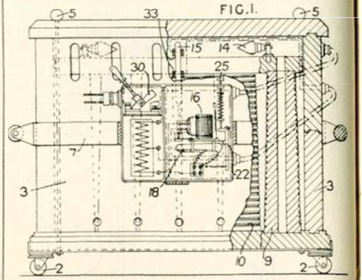
Thermostats.—In a device for automatically closing an electric circuit at predetermined temperatures, of the kind in which a mercury vessel communicating with two thermometer tubes, can be set to various angles corresponding to different temperatures, the thermometer tubes are connected at their free ends. The mercury reservoir is formed with an extended surface in contact with the air, either by sealing two glass tubes *a*, *b* together at their ends, as shown, or by helically coiling a portion of the tubes *c*, *e*.

9493. Foster, E. April 19.

Non-conducting coverings.—An adhesive for attaching heat-insulating materials upon the surface of a boiler &c. is made up of the following ingredients preferably in the proportions mentioned:—30–50 lbs. of silicate of soda, 1–3 lbs. of asbestos pulp, ½–1 lb. of vegetable or animal oil, ½–1 lb. of alkali, and 10 gallons of water. The oil and alkali dissolved in water are mixed, and, with the asbestos, are added to a hot solution of the silicate in water.

10,097. Löfquist, H. April 25.

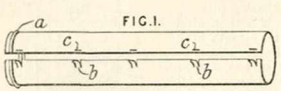
FIG.1.



Thermostats.—A thermostat 15 for controlling the supply of current to an electric heater is of the ordinary mercury thermometer type with its contacts connected with bands 33 surrounding the stem, to enable the thermometer to be placed readily in fixed contact bands to connect it in circuit. It controls an electro-magnet 16 operating a rocking mercury switch 18, which is then held in the open position by a spring-controlled latch 22, and can be closed by hand only, by means of a push releasing the latch, stored heat only being given up after the switch 18 has once opened.

10,398. English, W. E., and **Mills, C. H.**, [*trading as* Thermal Insulating Co.], and **Perkins, H.**, and **Hastie, J. C.** April 28.

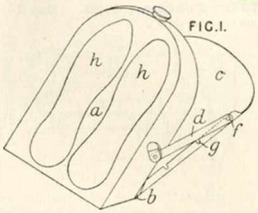
FIG.1.



Non-conducting coverings.—A non-conducting covering for steam-pipes &c. comprises loose or fibrous non-conducting material, such as silicate cotton or flock asbestos, located within a casing comprising lengths of sheet-metal spaced from the pipe by means of distance-pieces composed of solid non-conducting material, such as magnesia or asbestos in the form of semicircular or lesser segments, each casing length having its longitudinal seam fastened by means of slots *c* receiving bent tongues *b* cut without waste, and having a raised bead *a* forming an abutment for the end of the next length.

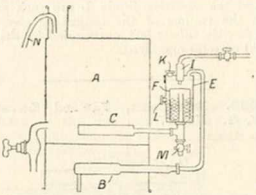
11,120. Träger, H. May 5.

Foot-warmers.—A portable foot-warmer for patients comprises a hollow body portion *a*, provided with depressions *h* for the feet are hinged at *b* to a stand *c*. Stays *d* with studs *f* engaging slots *g* formed in the upturned edges of the stand *c* allow the body portion *a* to be secured in any desired position.



11,308. Claughtons, Ltd., and **Austin, E.** May 7.

Thermostats.—An air-vessel C is connected with an inverted float F which regulates the supply of gas through a valve I to a burner B. The supply of liquid to the vessel E is effected by means of plugs K, L, and the thermostat is regulated by means of a tap M which allows air to escape from the float. The valve may be of any construction, such as a conical lift valve, and has a by-pass. The air-vessel C is placed in an oven or a vessel A containing liquid to be heated; the latter may have an overflow tube N.



11,463. Fyfe, W. W., and **Fyfe, J. W.** May 9.

Thermostats.— A thermostat is provided with a piston-operated lift valve, of the type in which the supply of fluid pressure to the operating-piston *e* is controlled by a double-seated auxiliary valve *c* actuated by an electro-magnet *i* acting through a lever *f* or screw, and which is provided with an adjustable spring stop d^2 and with an auxiliary valve having a hollow spindle c^1 through which the exhaust is discharged. The electro-magnet is switched into circuit, when any predetermined temperature is reached, by utilizing the expansion of mercury in a vessel. A convenient thermally-operated device is shown in Fig. 1, in which the mercury tube *l* is inserted in a cup *o* containing mercury, one contact being formed by the angle-piece *n*, while the other is fromed by an adjustable member *m* screwed into the cap *m*. In a modification for controlling the mixture of hot and cold water to maintain a constant outlet temperature, two valves are employed with their auxiliary valves mounted on a common lever. The electro-magnet is switched into circuit by a relay controlled by a thermally-actuated device in the outlet pipe.

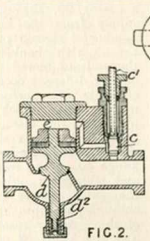


FIG.2.

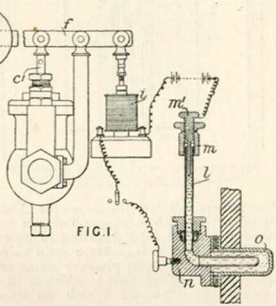
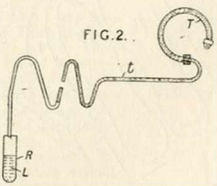


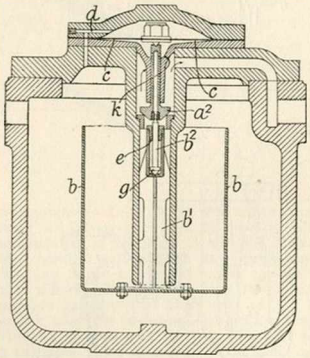
FIG.1.

11,798. Fournier, J. B. May 13, 1909, [*Convention date*].



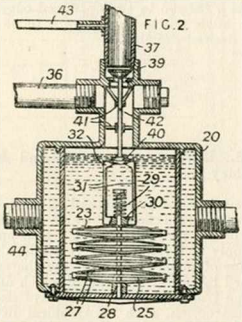
Thermostats.—In means for indicating and regulating temperature, as described in Specification 18,507/05, the volumes of the reservoir R and the sensitive liquid L are each greater than the volume of the indicating element T and flexible tube *t* left unoccupied by the inert liquid or solid employed.

12,068. Davidson, J., and **Larmuth, W. O.** May 17.



Steam-traps.—Relates to means for obtaining a rapid action with minimum force in bucket steam-traps of the kind described in Specification 16,597/09. The trap has a main valve a^2, normally closed by steam pressure acting on the upper side of a diaphragm *c*, which is in communication by a passage *d* with the trap. A pilot valve b^2 is opened by the downward movement of the bucket *b*, to admit steam through the hollow spindle of the main valve to the lower side of the diaphragm; the diaphragm is thereby maintained in equilibrium, and the steam pressure in the trap lifts the main valve. A small hole *k* allows steam and water to leak from the lower side of the diaphragm, so that the diaphragm descends when the float has raised the pilot valve. The pilot valve has a collar *g*, which is engaged by a collar *e* carried by the ribbed support b^1 of the bucket.

12,621. Miller, A. E. May 24.



Thermostats.—The gas supply to the burners of a water-heater is automatically controlled by a thermostat which is operated by the temperature of the water and is provided with means for imparting a sudden opening or closing movement to the gas valve. The thermostat 23 is preferably located in an inner chamber 44, containing oil or other liquid and arranged within a casing 20, through which passes the water supply from the heater, and it comprises a number of elements each composed of a central bar 25 with shouldered ends in which engage the ends of bowed pieces 27, the parts 25, 27 having different coefficients of expansion. The elements are perforated centrally, and slide upon a rod 28, which carries a spring 29 bearing upon the top element. To this is secured a yoke 30, having resilient arms 31 with wedge-shaped heads 32 adapted to engage the bevelled flange 40 on the rod carrying the gas-valve 39 and sliding in guides 41. The Figure shows the valve open. Gas passes to the burner through the pipes 37, 36. As the temperature of the water increases, the thermostat expands and the heads 32 press against the underside of the flange 40, a stop 42 on the valve-rod preventing upward movement of the valve. The heads 32 consequently separate until they pass the edge of the flange, whereupon they spring together and, pressing on the upper side of the flange, force the gas valve sharply on to its seat. As the water cools, the reverse operation effects the opening of the valve. A pilot burner is supplied by a pipe 43.

Reference has been directed by the Comptroller to Specifications 13,761/89, 2177/00, 21,335/01, 11,272/05, 13,175/05, 19,276/05, 4490/06, 15,533/06, and 11,072/08.

13,811. Ogden, J. E. L. June 7.

Steam-traps.—In a steam-trap having a head *c* movable in an arc by the differential expansion of two tubes *a*, *b*, and also a double seated valve *d* of the type described in Specification 286/04, a spring *e* acts on the head to prevent the valve seat from moving away from the valve on the occurrence of a small reduction of the pressure and temperature of steam in the expansion tube *a*. The spring is supported by a lever *f* and a stop *h* permitting upward movement of the valve *d* by expansion of the tube *a*. A displacer rod is placed within the upper portion of the expansion tube *a*, to reduce the escape of steam when the valve is open, and to increase the cooling effect of the water. Means are provided for allowing the movement between one or both of the tubes and their support *i*, such as a nut *j* which rides against two lugs *k* on the support, the end of the tube being screwed into a union piece *m* rounded as shown to work in a countersunk portion of the support; or the tube may have a collar capable of universal movement in a nut fixed to the support.

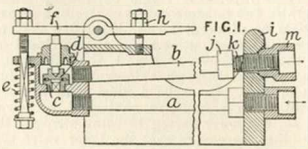


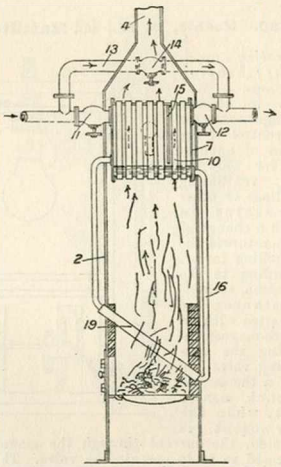
FIG. 1.

13,817. Herbst, G., and Ziegler, J. June 7.

Non-conducting coverings. — Heat-insulating walls are constructed from unpressed peat sods which have been coated with wood, tar, or the like by heating those surfaces of the sods which are to be jointed together by means of a soldering lamp or the like until the coating commences to melt when the sods are pressed on or against one another.

14,632. Parry, H. June 17.

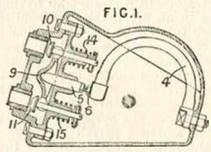
Steam-traps.—Water condensed in a steam-pipe collects in a drum 7, and passes thence through a number of tubes 19, the tubes and drum being heated by a fire, so that the water is re-evaporated to dry steam. The drum may be of circular or cylindrical shape, and has baffle-plates 15, and may be provided with fire-tubes 10, through which the gases from the fire pass to an uptake 4. The drum and the inclined tubes 19, which are connected with the drum at different levels by tubes 16, are located in a casing 2. The inclined tubes may be removable, and may be of different material from the connecting-tubes 16. The drum may be provided with a safety-valve, test-cocks, and a gauge-glass. A by-pass 13 with a valve 14 may be used, and the passage of steam further controlled by valves 11, 12. The drum may be replaced by a U-shaped tube. A number of such traps may be used, each having a separate fire, or with tubes leading to one fire.



14,829. Skipworth, G. P. June 20.

Steam-traps. — A single expanding member operates two or more valves controlling separate outlets at different levels, the valve that controls the lowest outlet being always closed last. In the trap shown in Fig. 1, the valves 10, 11 are operated through a lever 9 and a sliding pin 5, by a bent tube 4 filled with a volatile liquid. The valves are controlled by springs 14, 15, the lower spring 15 being stronger than the other, to ensure that the lower valve closes after and opens before the upper valve. The lever 9 is forked at the ends, and the pin has an adjusting-screw 6. The trap may be fixed directly to a pocket in a steam-pipe, or pipes from the trap may be connected one with the bottom of a pocket, and the other with a steam-pipe, or both may be connected with a pocket, one extending upwards a short distance into

FIG. 1.



the pocket. In another arrangement, the pipes lead from lower and upper parts of the steam-pipe. Instead of springs of different strength, the lever may be supported by the pin at a point nearer one end. The lever may act on similar forked levers to operate four valves.

15,524. Lindemann, O., [*Kartung, Geb.*]. June 28.

Heating buildings.—In steam heating-apparatus, more especially apparatus operated with reduced high-pressure steam, the fresh steam used is reduced in temperature twice or several times by being repeatedly mixed with air on its way to the place where it is used. Heaters arranged for circulation of air, such as are described in Specification 2132/02, are fed with steam mixed with air instead of steam alone.

16,530. Nesbit, D. M., and **Hamilton, N.** July 11.

Heating - apparatus; heating buildings. — Relates to electric arrangements for the control of the valves of apparatus for warming and ventilating buildings, or other apparatus in which a change of temperature is the controlling factor. According to the invention, suitable resistances are connected with an electro-magnet actuating the controlling-valve and with a thermostat in such manner that, when the thermostat is operated, the current through the magnet is increased so as to operate the valve. The invention is described as applied to a heating system. The controlling-valve *a*, Fig. 5, is fitted with an electro-magnet *b* and is normally kept open by a spring *d*. The magnet *b* is in

FIG. 1.

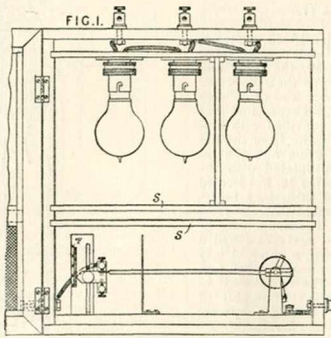
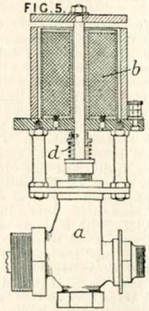


FIG. 5.



series with a resistance, which, in the case of a supply current of 100 volts, may be three lamps *i*, *k*, *l* of 16, 8, and 5 candle-power respectively. The thermostat *m* is arranged as a shunt across the lamps *k*, *l*. With the supply switch closed and the thermostat in its normal position, the

current traverses all the lamps and is then not of sufficient strength to enable the magnet *b* to overcome the spring *d* and close the valve. When, by a rise of temperature, the thermostat completes its circuit, part of the resistance is cut out, thereby enabling the magnet *b* to operate the valve against the action of the spring *d*. In Fig. 3, a supplementary switch *u* is adapted to be closed by the closing of the valve so as to cut out the eight candle-power lamp and introduce a lamp of smaller power, thereby saving energy when the valve is in its closed position. For central control, each unit of the system is fitted with apparatus as above and connected by leads to switches in the boiler room or the like. Fig 1 shows the lamps and thermostat arranged in a box and separated by asbestos partitions *s* with an air space between. The hinged front of the box may be open at the bottom and protected by wire gauze, while the upper part may have windows so that the lamps may be seen; or the lamps may be of different coloured glass and the words "open" and "shut" placed in proximity to the windows. suitable visible or audible signals may be provided on or near the switch-board to indicate the condition of any particular valve.

FIG. 2.

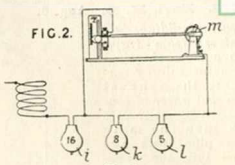
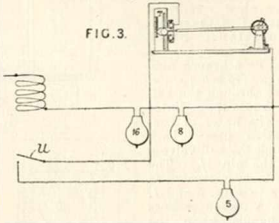


FIG. 3.



16,941. Schröder, K. July 15.

FIG. 4.

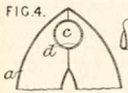


FIG. 5.

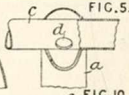


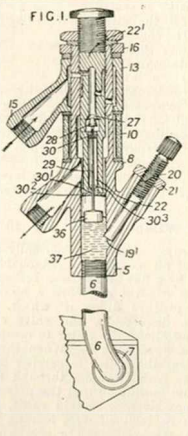
FIG. 10.

Radiators. — Consists in using wrought-iron tubes *a*, bent over and connected at their ends as shown in Figs. 4 and 5, or connected to junction boxes *g* as shown in Fig. 10, the various elements being connected by a cross-tube *c* formed with apertures *d*. The ends of the tube *c* project at each end, and are provided with removable plugs for facilitating cleaning.

17,442. Holmes, E. L. July 22.

Thermostats.—An automatic temperature regulator for gas-heaters comprises a lift-plug valves 28 actuated by a float 36 controlled by an expansible liquid 37 contained in chambers 5, 7, and a pipe 6. The capacity of the chamber 5 is varied by a plunger 19^1 adjusted by a screw 20 secured by a lock-nut 21. The valve-seat 27 is carried by a vertically-adjusted member 22^1, which also carries the guides 30, 30^1 for the valve spindle 29, the lower guide 30^1 being provided with a flange 30^2 to close the float chamber, and with a funnel 30^3 to return mercury condensed in the chamber 22. A sight

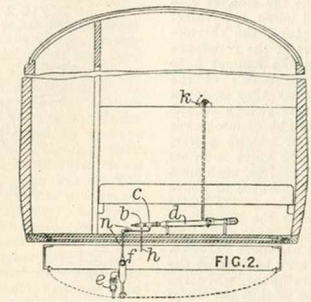
FIG. 1.

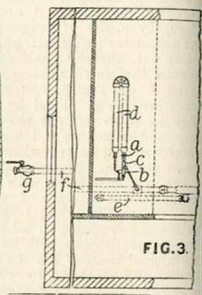


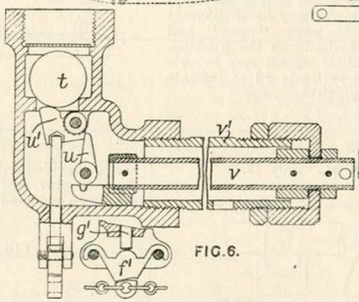
glass 10 is held against a shoulder 8 on the main casing by a nut 16 bearing against a socket 13 formed on the gas inlet 15.

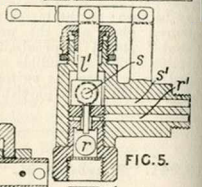
18,572. Earl, H. D. Aug. 6.

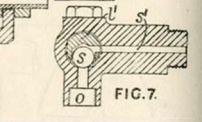
Heating buildings &c.; radiators; steam-traps. — In a steam heating-system for railway carriages, the exhaust steam and water of condensation normally pass back into the main steam-pipe, but are voided into the atmosphere when a radiator is cut out of the steam circulation. Steam from the main pipe *f* passes by a branch pipe *n* to a T-piece *c*, and thence through the ball valve *b* into the radiator *d*. The water of condensation passes back through the ball valve *g* into the pipe *f*. The valve *b* is constructed as shown in Figs. 5 and 7. When a passenger puts the handle *k* in the "on" position, the spindle l^1 is operated by links, and the ball *r* is pushed off its seat, allowing steam to enter by the port r^1. In the "off" position the ball *s* is lifted from its seat, and the ball *r* is seated, shutting off the steam supply. The contents of the radiators then pass to the atmosphere by passages s^1, *o*, and *h*. Water of condensation is released from the pipe *f* by the expansion trap *c*. When cool, the levers *u*, u^1 hold the valve *t* off its seat, allowing free passage to the atmosphere through the tubes *v*, v^1. Expansion of the tube *v* moves the levers *u*, u^1, and the valve *t* drops on to its seat. A spindle g^1 operated by a lever f^1 allows the valve *t* to be held off its seat for flushing-through purposes. When the main valve *g* is closed preparatory to disconnecting the carriages, a port in the valve spindle allows the contents of the flexible connexion to pass away to the atmosphere. Another small port is constantly open to the atmosphere in this position so allowing steam to pass to the end of the main steam-pipe.











19,198. Wilson, C. S. Aug. 16.

Steam-traps.—A float *d*, normally resting on supports a^6 on an inclined detachable base a^2, is secured by a flat arm d^1 to a bell-crank lever, turning on a pivot d^2 above a recess a^5, and having a concave finger d^3 which, when the float rises, displaces a ball valve *c* from its seat b^1, and allows the water to escape through a hollow screwed plug *b*. When the float has again fallen, the ball *c* is carried back to its seat by the rush of steam through the outlet. When steam is shut off and the pressure in the casing drops below a certain value, the ball *c* rolls down its inclined seat, leaving the outlet open. A transverse rod *e* prevents the ball from leaving the recess a^5. The inlet a^3 is provided with a baffle. In a modification, the valve seat b^1 is inclined so that the finger d^3 pushes the ball up the incline when the float rises.

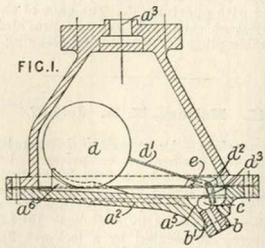
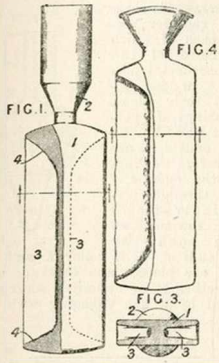


FIG.1.

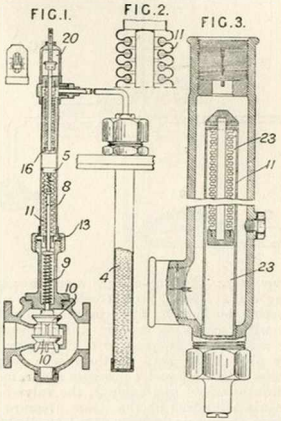
19,317. Farnam, G. D. Aug. 17.



Hot-water bags.—Seamless hot-water bags &c. are made by dipping a former having longitudinal grooves or recesses, which are closed at their ends, so that a portion of the bag is produced on the walls of the recesses, and the remaining portion on the flat faces of the former. The former 1 is of narrow cross-section, and at one end is formed with a funnel-producing portion 2. Grooves or recesses 3 are formed in the longitudinal edges of the former and have inwardly-curved end walls 4, and bottom walls of less extent than that of the grooves at their open sides. The former is withdrawn through the filling-opening which stretches sufficiently for this purpose. Fig. 4 shows the bag with the end walls turned in.

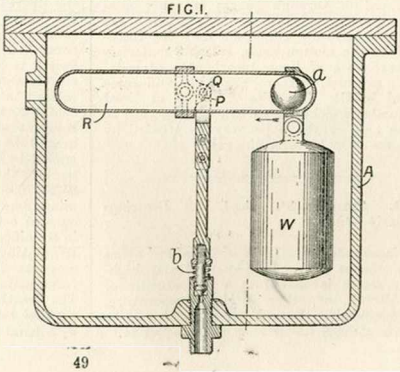
19,500. Sandvoss, C. Aug. 19.

Thermostats; steam-traps.—A thin metal packing-sleeve for a piston-rod operating a valve has deep corrugations of nearly circular section as shown at 11, Fig. 2. In the thermostat shown in Fig. 1, a sleeve 11 is connected between a socket 13 and a piston 5, which is



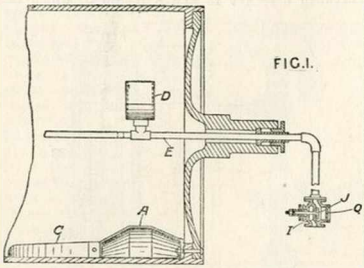
operated by the expansion of a fluid such as glycerine or mercury in a vessel 4, and is connected with a gas-furnace valve 10 or other supply-valve, by means of a spring to prevent over-actuation. A spring 9, coiled round the valve spindle, normally opens the valve. Adjustment by varying the capacity of the vessel 8, may be made by means of a piston 16 having a sleeve, and a collar and scale 20. In a modification, the thermostat controls the damper of a stove or furnace through a lever, and an adjustable connexion. Fig. 3 shows the sleeve 11 applied to a steam-trap, the expanding fluid being contained in a vessel 23.

19,548. Burgess, E. Aug. 20.



Steam-traps.—As water accumulates in the vessel A, the upthrust on the float W increases until the float rises sufficiently to cause a ball *a* in the hollow beam R to run to the other end. A pin Q on the beam then strikes the upper end of a slot P in the valve spindle, and opens the valve with a jerk. The spring *b*, or a suitably-arranged counterweight, causes the spindle to follow the beam and take up the lost motion

19,584. Happer, J. R., and **Horsburgh, J. K.** Aug. 22.



Steam-traps.—Drying-drums used in paper-making &c. are freed from condensation water by causing buckets A, fixed to the drums and fitted with scoops C, to tip their contained water into a pan D fixed to a stationary discharge pipe E. A trap on the discharge pipe comprises inlet and outlet passages separated by a perforated web I and valve J, the valve being held against the web by the steam pressure and a spring, and periodically rotated to discharge the water, automatically or otherwise. A glass plate Q allows observation of the inlet side.

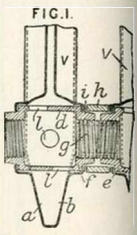
19,808. Ribbe, F. Aug. 24.

Non-conducting coverings.—Volcanic or other fusible rock is insufflated with air or gas when in a melted condition, so as to form pores in the cast material. Before the temperature has fallen to 500° C., the material is re-heated and annealed at 800° C.; it is then slowly cooled. Air may be introduced through tuyeres into the melting pot or through quartz or other non-fusible pipes; or substances which produce gas at the temperature employed may be introduced into the molten mass, suitable materials being carbonate of lime, bicarbonate of soda, gypsum, sawdust, carbon, graphite, and some kinds of basalt. Crucibles made of or lined with plumbago, coke, or carbon may be used to give the gas; or the pores may be created by using cores or by blowing like gas.

21,233. Jensen, F. Sept. 12. *Drawings to Specification.*

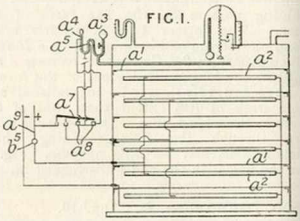
Heating-apparatus.—In heating bakers' ovens &c. by means of superheated steam, high-pressure steam is heated to a temperature of about 550° C., or other desired temperature, and, after passing through the apparatus to be heated, is utilized for driving a steam-engine.

21,735. Thiel, R. Sept. 19.



Radiators.—To connect two radiator sections V, each of which is constructed of two similar sheet-metal portions *a*, *b* welded together at their edges, hollow casings *d*, perforated at *l* and having polygonal ends *e*, *f*, are inserted before welding, so that the ends *e*, *f* protrude through correspondingly-shaped orifices in the sections. Between each two adjacent ends *e*, *f*, a collar *h* and suitable washers *i* are placed, and the ends are then drawn together by an oppositely screwed nipple *g* operated by a key engaging with internal projections.

22,046. Rorke, T. J., Thame, J., Rorke, E., and **Benson, H. S.** Sept. 22.



Thermostats.—In vacuum apparatus in which the degree of heating and vacuum, as well as the degree of drying, concentration, or evaporation of the material heated, are automatically controlled, a thermostatically-controlled relay switch is employed which controls the heating-circuit and also the circuit closed by the thermostat in operating the switch. The drying-chamber, shown in Fig. 1, is furnished with roller-fitted trays a^1 &c., and is electrically heated by elements a^2. The heating is controlled by adjustable thermostat a^3, which may be of the type described in Specification 25,254/09. This thermostat has maximum and minimum contacts a^4, a^5, which control the current actuating the relay switch a^7 described in Specification 12,175/08, [*Class* 38, Electricity, Regulating &c.], which is actuated by electro-magnets a^8 and controls the heating-current from mains a^9 and also the actuating-circuit. The heating-elements are arranged in two parallel series, one of which may be cut out by a hand switch b^5. In place of using a single

adjustable thermostat, two thermostats working at different temperatures may be arranged so that either may be brought into operation. The heating may be controlled as described in Specification 9481/08, a relay switch putting the heating-elements either in series or in parallel.

22,397. Rorke, T. J., and **Rorke, E.** Sept. 27.

Thermostats.—A valve for regulating the flow of gases or liquids for heating purposes is operated by thermally-controlled electro-magnets a, a^1, Fig. 2, with cores a^2, a^3, which are connected with the valve spindle c^3 by means of an adjustable flexible member such as a chain a^4. Specification 9481/08 and 12,175/08, [*Class* 38, Electricity, Regulating &c.], are referred to. A pulley b on the valve spindle carries the chain, and is provided with a lost-motion device, consisting of two pins d^1, d^2 which are fitted in holes on the pulley, and are engaged by a projection d on the chain. The cores carry contact-members consisting of nickel pins b^5, b^6 dipping into mercury-cups b^2, b^4 and carrying hollow perforated vessels b^8 of nickel or steel, from which mercury escapes slowly so as to ensure that the circuit is broken after the valve has been operated. The movement of the cores is limited by nuts b^7. Washers $b^{7\times}$ prevent the escape of mercury. In the position shown in Fig. 2, the circuit through the electro-magnet a^1 is opened by the contact b^5, and the circuit through the electro-magnet a closed by the contact b^6. In the arrangement shown in Fig. 5, a relay is connected between the contact-thermometer and the electro-magnets, and is arranged to open the circuit of the thermometer. The relay consists of electro-magnets f^1, f^2 with a rocking armature carrying a tube f^3, which has contacts at the centre and ends, and contains mercury to control the circuit through the relay magnets and thermometer. The armature also carries contacts g^2 dipping into mercury-pots g^3 in the circuits of the electro-magnets operating the valve. The contact-thermometer consists of a U-tube with maximum and minimum contacts, the bore of the tube being restricted at the contacts. The valve is of the ordinary sluice type, and may have parallel faces, or be wedge-shaped. An indicator may show the settings of the valve.

FIG 5

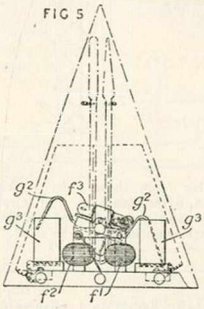
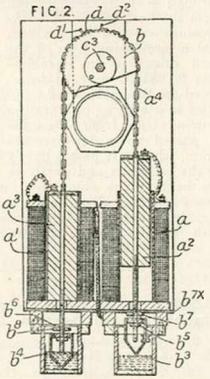


FIG 2.



23,621. Turner, H. R. Oct. 12.

Non-conducting coverings for heat and sound.—A non-conducting covering in sheet, block, or slab form is made with a layer of asbestos &c. in corrugated or corrugated and plain sheets, and the interior is divided into cells by similarly-constructed partitions, and filled with silicate of cotton, asbestos fibre, magnesium carbonate, infusorial earth, cork, &c. The covering may be suitably proofed or coated.

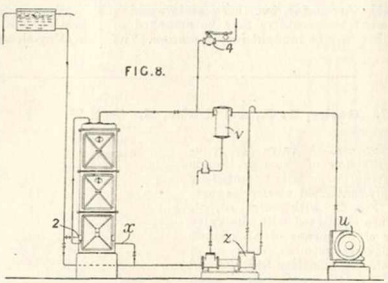
FIG. 2.

24,573. Nesbit, D. M. Oct. 22.

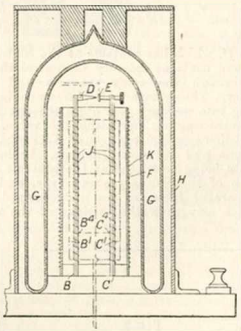
Heating buildings.—Relates to apparatus for heating water by direct contact with steam, for cooking and washing apparatus, buildings, &c. In one application, shown in Fig. 8, exhaust

steam from an engine *u* is freed from grease in a separator *v* with a trap, and passes through the heater, hot water from which is withdrawn through a pipe *x* and fed by a pump *z* to one or more boilers. Make-up water is supplied from a tank through a valve 2 operated from the float valve. A back-pressure valve 4 is provided, and a circulating trap of the kind described in Specification 25,234/02 may be interposed in the system. As applied to a heating or warming system, steam from an engine is passed to a low-pressure drum, whence it passes partly to the radiators and partly to the heater; the steam and water from these pass to another drum, and thence, after straining, to the heater, the water being pumped back to the boiler. In another application to cooking, washing, &c., a storage tank and circulator are used; while in a system of heating large buildings two circulators may be used.

FIG. 8.

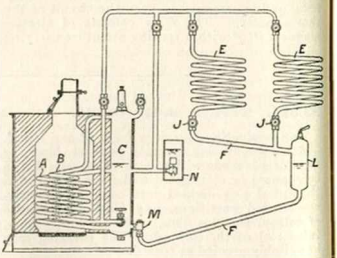


24,668. Cambridge Scientific Instrument Co., and **Darwin, H.** Oct. 24.



Thermostats.—The temperature of the cold junction of a thermo-electric circuit for measuring or recording temperature is kept constant by means of a bimetallic thermostat, which is placed at or near the junction, and controls a heating-device; the thermostat may itself form the cold junction. In the arrangement shown, two bimetallic strips B, C are formed of brass and invar nickel steel, to which are soldered in several places wires of copper and constantan, which form the elements of the wet junction, the copper wires B^1, C^1 being connected with the brass strips, and the constantan wires B^4, C^4 with the nickel-steel strips. The strips carry adjustable contacts D, E, and also electric heating-coils J, another heating-coil K being wound on a brass cylinder F. When the temperature of the cold junction is too high, the contacts engage and close a circuit shunting the heating-circuit; or a thermostat may open the heating-circuit. The thermostat may control a gas-tap regulating a heating-flame. The cylinder F is surrounded by a double-walled glass vacuum-chamber G and by an outer casing H.

25,415. Carrington, H. C. J. *May 2, 1911.*



Heating by circulation of fluids.—A low-pressure closed-circuit apparatus using superheated vapour for obtaining temperatures between 500° F. and 1500° F. for heating stoves or ovens for japanning, lacquering, baking, drying, or for boiling liquids, comprises a generating-coil A and a superheating-coil B

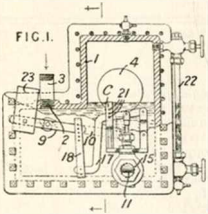
placed in the same furnace. The coil A is connected to a reservoir C so as to be always flooded, and the coil B is connected to the top of the reservoir and leads to the heating-coils E. The condensate from the coils flows by a pipe F to a collecting-box L and thence to the reservoir through the valve M. The proper level in the reservoir C is maintained by the filling-box N, which contains a pair of submerged valves, the lower a gravity valve for admitting fresh liquor when the apparatus cools, and the upper a loaded safety-valve. The superheated vapour of oil or mercury may be used in the apparatus, with or without a suitable stable gas, such as hydrogen.

25,764. Nielsen, H. Nov. 10, 1909, [*Convention date*]. *Void.* [*Published under Section 91 of the Act.*] *Drawings to Specification.*

Thermostats.—A heat-regulator for stoves and other ovens comprises a body, such as a thin wire or chain, exposed to changes of temperature of the air in the room in which the stove is placed, and adapted to be connected to the air-supply valve or flap of the stove. The wire or chain may be led over rollers to a remote part of the room.

26,091. Burby, J. M. Nov. 9.

FIG. 1.



Steam-traps.—A float 4 in an L-shaped chamber 1 is attached to an arm of a rocking shaft, which passes through a bearing in the side of the chamber, and carries a two-armed lever 9 with a counterweight 23. The lever 9 is adjustably linked at 18 to a lever 17, connected to a valve 11 in the outlet pipe 15. The apparatus is arranged so that the level of the water in the casing, which is indicated by a gauge 22, is always above that of the inlet 2, thus closing the steam-pipe 3 by a water-seal. A pin inserted in any of several holes in a guide *c* limits the movement of the lever 17 and the opening of the valve, and may be removed to allow the valve to be opened by hand to discharge sediment from the casing. In a modification, lost motion is allowed between the lever 17 and screws set adjustably in a loop on the valve stem.

26,342. Dormus, F. R. von, and **Fleischmann, J.** Nov. 12, 1909, [*Convention date*].

FIG. 5.

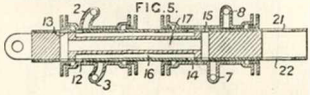
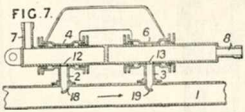


FIG. 7.



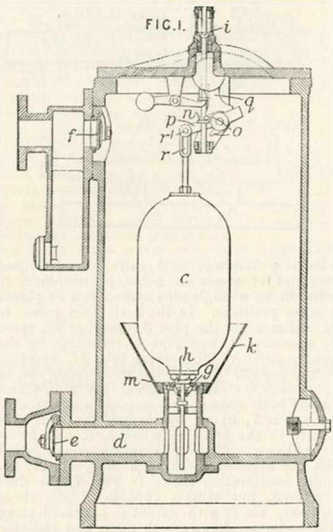
Heating buildings.—A valve for controlling the inlet of steam or other heating-fluid to radiators on a single-pipe system can be placed in three positions. In the first, fluid passes to the radiator via the pipe 3, aperture 12, space 16, aperture 14, and pipe 7, returning by the pipe 8, aperture 15, central tube 17, aperture 13, and pipe 2. The central piston slide can be moved into the position shown in Fig. 5, which cuts off both main connexions 2, 3 and radiator connexions 7, 8; or, by moving the slide still further to the left, the tubes 7, 8, and hence the radiator will be put into communication with the atmosphere through the ports 21, 22. In the modification shown in Fig. 7, the slide is altered, but still is capable of the three positions, viz.: with radiator communicating with main, as shown; both main and radiator connexions cut off; and the extreme position, when the ports 12, 13 are outside the supports 4, 6, with radiator open to the atmosphere. The pipes 2, 3 are formed with scoop-like ends 18, 19 projecting into the main pipe 1, so as to cause a circulation of the fluid through the heater.

26,407. Millington, W. E. W. Nov. 14.

Steam-traps.—In a float trap for discharging liquid at pressures either above or below that of the atmosphere, the liquid enters by a non-return valve *f* and raises a float *c*, which directly opens a discharge valve *h*, allowing the liquid to enter a passage *d*. If the pressure in the trap is above atmospheric, the liquid escapes through a non-return valve *e*. If the pressure in the trap is less than atmospheric, the liquid collects until the bottom of a slotted link *r* on the float engages a pin r^1, and thus causes a tumbling lever *p*, *q* to fall over and, by the engagement of lugs *o* with a collar *n*, to open a valve *i* and admit the atmosphere or other source of pressure to the trap, while simultaneously closing a similar valve communicating with the system to be drained. The liquid can then escape through the non-return valve *e*. The discharge valve *h* may be simple, or may

consist, as shown, of a pilot part connected directly to the float, and a loose valve g connected to the float with some lost motion. The opening of the pilot part alone is sufficient to

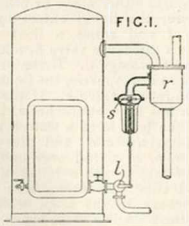
FIG. 1.



discharge the liquid when the pressure in the trap is considerably above atmospheric. A sheet-iron funnel k, having small holes m at the bottom, is provided to ensure the discharge of oil from the surface of the water. Specification 20,348/00 is referred to.

26,495. Morison, D. B. Nov. 15.

FIG. 1.



Heating by circulation of fluids.—In systems such as are employed, for example, on ships, in which exhaust steam from auxiliary engines and steam generated in an evaporator are utilized conjointly for supplying steam to feed-water heaters, low-pressure turbines, or other steam-heated or steam-driven devices, the steam generated in the evaporator is controlled in accordance with the steam pressure in the system or the temperature in the heater, so as to compensate for any surplus or deficiency in the supply from the auxiliary engines, and thus furnish an approximately constant joint supply. As shown in Fig. 1, the cock l which regulates the admission of steam to the heating-coils of an evaporator is controlled by a diaphragm s subject to the steam pressure in a reservoir r, into which the joint supply is delivered. In a modification, the diaphragm controls the discharge of drainage water from the heating-coils.

26,526. Smidth & Co., F. L. June 15, [*Convention date*].

FIG. 1.

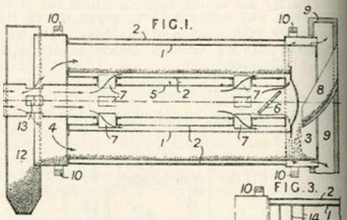
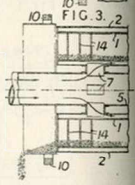


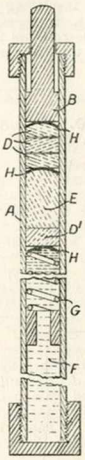
FIG. 3.



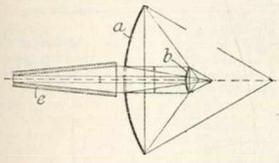
Heating-apparatus.—In apparatus for heating granular material the material passes from a hopper 8 through jacketed drums 1 arranged round a central cylinder 5. The drums are connected to end casings fitted with rings 10 which rest on rollers so that the whole apparatus may be rotated. Air supplied to the cylinder 5 may pass through passages 7 to the space between the jackets 2 and the drums 1. Air may also pass through apertures 13 to the interior of the drums. A valve 6 controls the flow of air through the cylinder 5. The ends of the casing 3, 4 may be enclosed in housings 9, 12. In a modification, Fig. 3, the housing 12 may be omitted, and the drums may be provided at their delivery ends with partitions 14 having openings. The openings in successive partitions are not in alinement with each other, so that material can pass out of the drum without allowing external air to enter.

26,713. Horne, A. D. Nov. 17.

Steam-traps. — In an expansion trap, the expansion of a fluid F in a cylinder A operates a piston B, the packing of which consists of disks of rubber D, D¹ and metal H, with a layer of gutta-percha E, and layers of plumbago (not shown), a spring G being used to keep the packing compressed.



26,782. Joh, F., and **Wolf, J.** Nov. 17.



Solar heat, utilizing.—Rays from the sun are reflected by a system of mirrors *a*, *b* into a thermopile *c*, the elements of which are so placed as to form a hollow cone, the large end of which is turned toward the mirrors.

27,228. Goodwin, W. G. Nov. 23.

Thermostats.—Consists in means for maintaining constant the temperature of a mixture of combustion products and steam produced in chambers D^2, E^2. The supply of water to the jacket H^2, Fig. 6, is controlled by a valve B^2, Fig. 8, in the suction passage of the water pump. This valve is loaded by a spring S^2 and carries a piston A^2 subjected to the pressure of air in a pipe P connected to a chamber N^4, Fig. 6, into which the open ends of air tubes N^2 heated by the mixture, project. The amount of opening of the valve B^2, and therefore the amount of water returned, is less when the temperature of the mixture in L^2 rises and vice versa.

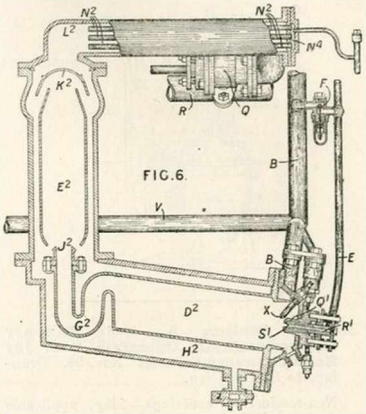


FIG. 6.

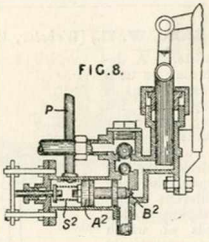
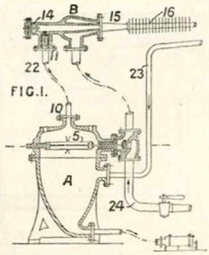


FIG. 8.

27,243. Marks, E. C. R., [*Heintz & Co., A.*]. Nov. 23.

Heating by circulation of fluids.—Relates to heating-systems in which the steam supply is automatically controlled, and consists in using a circuit which is closed indirectly by the steam introduced to make up losses in the circuit. The circuit comprises radiators 16, return pipe 23, steam-trap A, injector B, and flow-pipe 15. The upper part of the vessel A contains a thermostat 5 which governs the supply of compensation steam by controlling a valve in the steam pipe 24. The vessel A communicates with the injector B by a pipe 10, 22, a non-return valve 11 being provided. The injector B has a valve 14 which allows air to enter until the pressure rises to atmospheric, whereupon a complete steam flow only occurs. In a modification, the air-valve on the injector is discarded, and

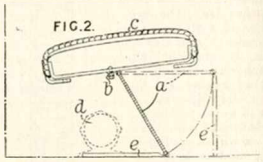
a non-return valve placed between the vessel A and the separator.



27,645. Muller, A., and **Veltener Schwermmstein Industrie Ges. für Schlackenverwertung.** Nov. 28. *Drawings to Specification.*

Non-conducting coverings.—Slag, applicable as an insulating filling for walls, floors, and ceilings, is separated from uniformly-ground furnace residues in a special centrifugal apparatus, the other products being coke and ashes.

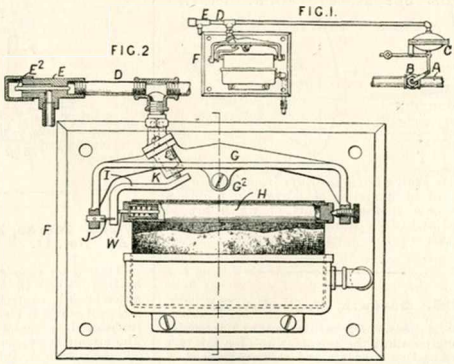
27,799. Woods, E., and **Woods, M.** Nov. 29.



Heating vehicles.—The radiator or heating-device *d* fitted under the seat *c* of a vehicle is screened by a perforated or wire framework *a* pivotally supported at *b* so that it slopes outwards. A support *e* may be provided to prop it clear of the floor.

27,961. Lake, W. E., [*Webster, W.*]. Dec. 1.

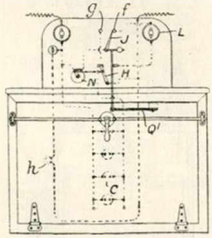
Thermostats. — A device which may be used as a thermostat but is specially applicable for maintaining air or gas at a constant degree of humidity, consists of a dry expansible body and a wet expansible body having different coefficients of expansion, the free ends of which bodies are operatively connected to a common lever or device for operating a controlling-valve or the like. The device F is adapted to open and close a vent K in a pipe D, which conveys compressed air past a pressure-reducing device E to a diaphragm motor C. A valve B in a pipe A conveying air, gas, steam, or other fluid for effecting the heating or moistening is operated by the motor in accordance with the fluctuations of pressure created by the opening and closing of the vent. The pressure-reducing device consists of a contracted passage fitted with a plug E^2, preferably comprising a round wire with one side filed away. The dry expansible body comprises a casting G of inverted U-shape, and preferably of aluminium, secured by a screw G^2 to a wall-plate or base, and supporting at one end a detachable plug connected by a spring hinge J to the vent-controlling lever I. The wetted expansible body H consists of a tube, preferably of hard rubber, supported at one end by the casting G, the other end pressing against the vent-controlling lever I through the medium of a spring-actuated pin W. The temperature of the bodies A, G respectively correspond to those



of a wet and dry bulb hygrometer. The spring-actuated pin takes up any extra expansion of the tube H after the vent K has been closed thereby.

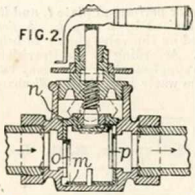
28,129. Ogden, G. J., Hay, M. M., and **Templeton, J.** Dec. 3.

Thermostats.—An electric oven has a thermostatic switch J with a hand switch L, which may be set to keep open the main switch H in the heating circuit C when opened by the thermostatic switch, or the latter may act independently of the hand switch to open and close the main switch. The main switch H is operated by an induction motor N, the circuit through which is controlled by the arm J moved by a bimetallic bar Q^1 between two contacts *f*, *g*. When the temperature rises, the arm J engages with the contact *g* and causes the motor to open the main switch. If the switch L is open, the main switch remains open, but if the switch L is closed, the motor closes the main switch when the arm J is moved into engagement with the contact *f* as the temperature falls.



28,189. Ahrens, H. Dec. 3.

Heating buildings.—Installations for heating by hot water with continuous circulation are provided with valves in the descending pipes so arranged that, while the passages to the radiators may be wholly or partly closed, the descending pipe can only be partly closed. Fig. 2 shows a valve for effecting this purpose. A sliding cylinder *m* has on the inlet side an opening *o* extending down to the bottom of the cylinder, so that the inlet is not interfered with by any movement of the cylinder. On the outlet side is an opening *p*, of such size that, on raising the cylinder, the outlet is partly closed, but not entirely. The passage to the radiators is controlled by a rim *n* on the cylinder *m* forming a lift-valve.



28,273. Shuman, F., and **Sun Power Co.** Dec. 5.

Solar heat, utilizing.—Hollow plates for heating and boiling water by solar heat are formed of two sheets of metal, one or both of which are provided with dot-like projections. The two sheets are fastened together at their edges and at the dots by dipping into molten metal.

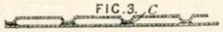


Fig. 3 shows such a plate in section, *c* being the metal securing the sheets together.

28,527. Relph, W. Dec. 8. [*Cognate Application*, 9315/11.] *Drawings to Specification.*

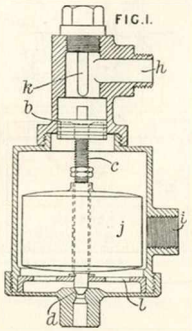
Foot-warmers.—A foot-warmer in the form of a hollow foot-plate is made of sheet-metal plates furnished with upstanding ribs or partitions arranged so as to form a tortuous passage for the hot water flowing therethrough.

28,689. Jenkins, A. D., Brook, E. T., and **Davidson, W. S.** Dec. 9.

Steam-traps.—In a trap for discharging water from the pipes of pneumatic signalling or other compressed-air systems such as are used on railways, the discharge valve *d* is normally closed by an unbalanced diaphragm or piston *b*, the space above which is connected to the pipes

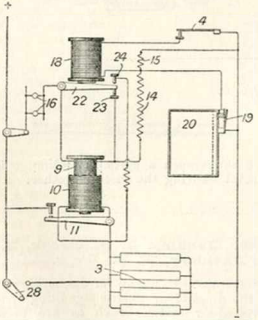
at h, the space below being connected to the pipes at i so as to receive the drainage water. As water collects, the excess pressure below due to the head in the inlet pipe i causes the diaphragm or piston to rise and open the discharge valve. The valve stem c is guided at the bottom

FIG. 1.



in a spider or perforated plate l, and its upward travel is limited by a stop k. A float j may be mounted on the valve stem c to help to open the valve. According to the Provisional Specification, a supplementary valve may be provided to close the water inlet during discharge.

29,463. Geissinger, H. G. Dec. 22, 1909, [*Convention date*].



Thermostats.—Means for regulating an electric heater consists of an electro-magnetic switch having two coils which act together to lift an armature 11 to close the heating-circuit, one coil 10 being short-circuited by the movement of the armature, and the other then holding up the armature until it is short-circuited by a relay, controlled for instance by a thermal device 4. The retaining-coil 9 is in circuit with resistances 14, 15 and lamps 16. When the circuit through the coil 18 is opened by the thermal device 4, the armature 22 drops on to a contact 23, thereby short-circuiting the retaining-coil, and the armature 11 opens the circuit through the heater 3. When the thermal device is closed, the armature 22 engages with a contact 24, and completes the circuit through the coil 10 to lift the armature 11. A switch 19 short-circuits the resistance 15 and the coil 18 when the door 20 is open, so as to open the heating-circuit. The controlling-circuit may be cut out by means of a hand-switch 28.

30,201. Trümpler, W. E. Jan. 10, [*Convention date*].

FIG. 1.

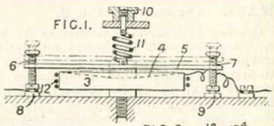
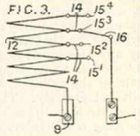


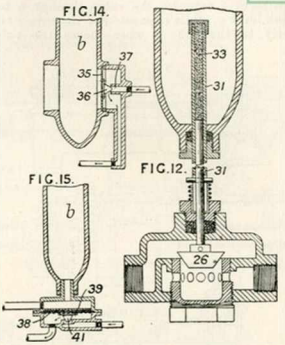
FIG. 3.



Thermostats for regulating electric heating-apparatus. A closed capsule or box 3 has a wall constituted by an arched or buckled diaphragm 4 adapted to change suddenly from a concave to a convex form or vice versa owing to the expansion or contraction of an electric medium enclosed in the capsule. The diaphragm 4 carries a conducting-strip 5 on which are mounted screws 6, 7 adapted to make and break contact with terminals 8, 9. The temperature at which the device operates can be regulated by adjusting the tension of a spring 11 by means of a screw 10. A heating-coil 12, inserted in the heating-circuit of the apparatus to be controlled, is mounted around the capsule. Portions of the capsule heating-coil 12 may be cut out by providing tapping-wires 14 connected to contact-studs $15^1 \ldots 15^4$ in the path of an arm or brush 16. Each side of the capsule may be constituted by a diaphragm adapted to buckle as above described.

30,228. Pulsford, F. C., and **Nesbit, D. M.** Dec. 29.

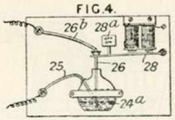
Thermostats.—Thermostatic gas regulators for gas-heated steam radiators are shown in Figs. 12, 14, 15. The regulator shown in Fig. 12 consists of a spring-loaded valve 26 controlled by a tube 31 with a filling 33 of gutta-percha, mercury, oil, spirit, or other material or liquid with a considerable coefficient of expansion. Fig. 14 shows a regulator consisting of a metallic diaphragm 35 with a conical valve 36 operated by the pressure in the radiator so as to uncover a gas inlet 37, and Fig. 15 shows a regulator consisting of two corrugated disks 38, 39 enclosing an expansible liquid and heated by water of condensation so as to operate the gas valve 41. The valves described in Specification 6819/09 may also be fitted so as to regulate the gas supply according to the temperature of the room.



A.D. 1911.

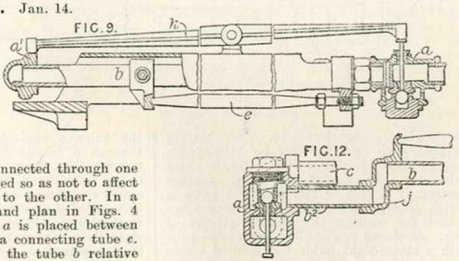
79. Nightingall, V. Jan. 2.

Thermostats.—The heating of an electric oven is controlled by a contact-thermometer operating a mercury-break electro-magnetic switch. The thermometer may be in circuit with a battery, or in the secondary circuit of a transformer. It has several contacts with a switch. The electro-magnetic switch has an armature 28, Fig. 4, carrying an indicator 28^a, and a plunger 26 dipping into mercury contained in a vessel 24^a, connexions being made by a flexible conductor 26^b and a rod 25.

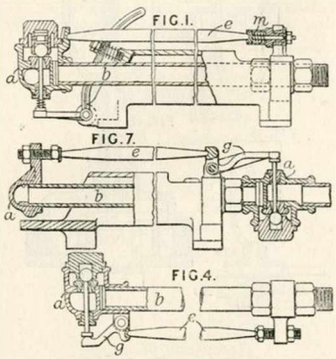


1070. Paterson, R. H. Jan. 14.

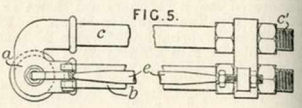
Steam-traps.—In a trap operated by the expansion of a tube relatively to a freely-mounted strut, rigid connexions are provided in the trap frame for the external steam and drain pipes, the expansion tube being secured to one, and its free end connected through one or more rigid tubes, arranged so as not to affect the working of the trap, to the other. In a trap shown in elevation and plan in Figs. 4 and 5, the valve chamber *a* is placed between the expansion tube *b* and a connecting tube *c*. Longitudinal expansion of the tube *b* relative



to a strut e actuates the valve through a bell-crank lever q, while expansion of the tube c relatively to the tube b only moves the valve-

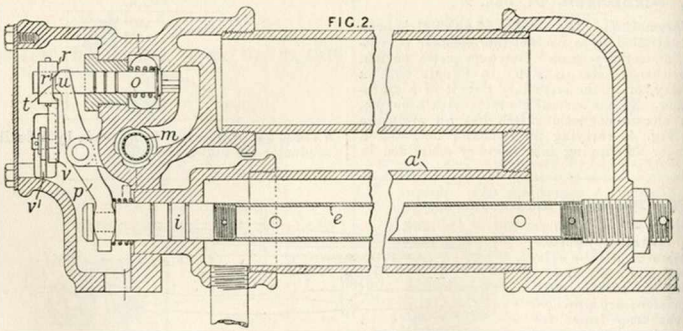


chamber transversely and therefore does not influence the valve-opening. In a modification, shown in Fig. 7, the valve-chamber is secured to the frame at the outlet, and the tubes are connected by a U-piece. In another modification there are two struts, mounted above and below the tubes, with a rocking abutment at the free end. In the trap shown in Fig. 1, the



strut is mounted above the tube b so as to cause depression of a valve-chamber a, placed between the tube b and the connecting-tube, when the tube b contracts. In a modification, the expansion-tube b is connected to the upper part of the valve-chamber, and the connecting-tube c is bent so as to be connected to the lower part. In another modification shown in Fig. 12, the valve-chamber is placed between a tube c and a lower tube b^2 connected to the tube b through a cored fitting j. In another modification, shown in Fig. 9, the valve-chamber a is secured to the frame at the outlet, and the tubes are connected by a U-piece a^1, the lateral motion of which is communicated to the valve by a rocking beam k. The strut e may in all cases have a resilient abutment consisting of a strong spring m, Fig. 1, or a spring-pressed wedge. Specification 28,182/08 is referred to.

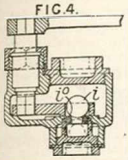
1447. Peters & Co., G. D., and **Le Clair, L. J.** *July 19.*

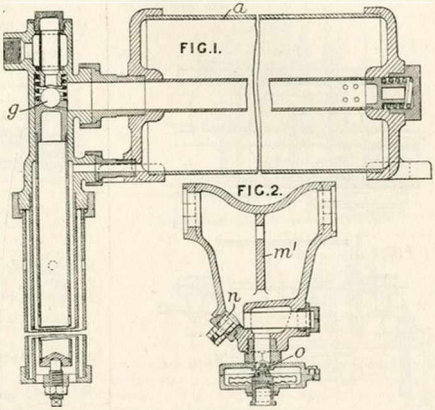


Thermostats; radiators.—In steam-heating apparatus, such as a radiator for railway-carriages, in which the outlet tube forms the outer member of a thermostat, the inner member consisting of a tube or rod, the inlet valve is operated through a rocking lever; means are provided for putting the thermostat out of action. As shown in Fig. 2, a perforated tube e with a steam-tight guide i is secured inside the outlet tube a^1 of a radiator, and operates the valve o against the action of a spring through a forked lever p. The lever bears against the collar r having a recess r^1, the collar being provided with an arm v, which may be operated by hand through a rod v^1 so as to turn the collar and bring the recess into engagement with a projection u on the lever, as in the position shown, to render the thermostat inoperative. A strainer m is provided.

2980. Sawyer, R. Feb. 6.

FIG.4.





Heating vehicles; radiators; steam-traps; thermostats.—In a system of steam-heating primarily intended for railway trains, having interposed between the main steam-pipe and the radiators a manually-operated valve, Fig. 4, and a pressure-reducing valve, an arrangement whereby the hand operation merely shifts into or out of operative position a ball valve *i*, which, in the closed position is kept on its seat i^0 by the pressure of steam. The reducing-valve *g*, Fig. 1, is thermostatically operated and is attached to the radiator *a*, the steam in the radiator itself being at atmospheric pressure. A drip pocket, Fig. 2, for interposition between the railway carriages is also included in the system, with a transverse diaphragm m^1 having holes for the free passage of steam. The water is retained and may be discharged by a thermostatically - controlled valve *o* or a hand-operated valve *n*.

3252. Wierz, M. Feb. 8. *Drawings to Specification.*

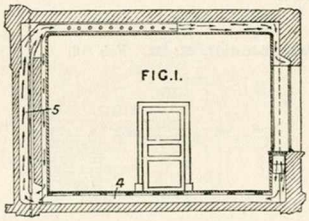
Heating buildings. — A vacuum is initially produced in a steam heating system by means of a pump &c. with a view to obtaining a selected temperature of steam below 100° C., the regulation of the system being effected subsequently by attention to the firing of the boiler producing the steam for circulation. A vacuum chamber is interposed between the exhauster and the heating-system, of such a size as to minimize variation of the vacuum due to fluctuations in the steam supply.

3337. Kleinschmidt, C. Feb. 9.

Heating buildings.—A room is warmed by causing air heated in a suitable space 5 to be distributed above the ceiling and to pass between the walls of the room and those of the building downwards to a space 4 below the floor, whence it is taken and again heated.

(*For Figure see next column.*)

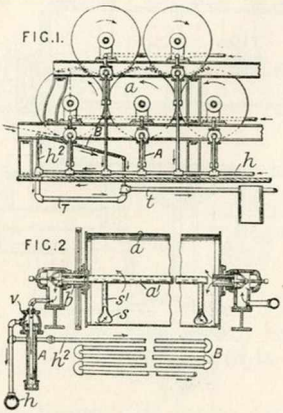
3337.



3600. Dexter, T. F. Feb. 17, 1910, [*Convention date*].

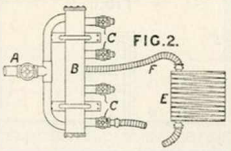
Steam-traps.—A machine for drying fabrics by passing them over steam-heated rollers is so arranged that low-pressure steam can be used, each roller being provided with a steam-trap, by means of which, and of other traps and condensers, uncondensed steam is prevented from passing to the exhaust main. The cylinders *a* are mounted on hollow trunnions *b*, Fig. 2, by one of which the steam enters. The steam and water of condensation leave the cylinder by a pipe a^1 and the other trunnion, scoops *s* and pipes s^1 conveying the water of condensation to the pipe a^1. The steam then passes to a trap A, constructed as shown, with a vent hole *v*. The steam and water pass from the trap A to a pipe *h*, Fig. 1, whence the water passes through a water seal T to the exhaust main *t*, and the steam by a pipe h^2 to

a condensing-coil B arranged below the fabric, and serving as an auxiliary heater. The water



from the condenser B passes to the exhaust main *t*.

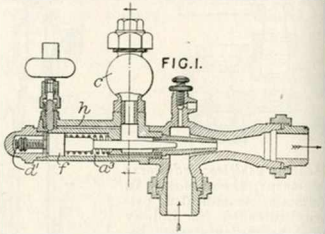
3890. Liddell, H. M. Feb. 16.



Heating ships and vehicles. — Comprises a distributing-apparatus for heating-systems. A pipe A conveys heated liquid to a main distributing-pipe B. Flexible tubes F leading from stop-valves C on the pipe B to radiators E located at suitable points, and flexible return tubes lead back from the radiators to a main return pipe similar to the pipe B and situated beneath it. A pipe conveys the liquid from this pipe back to its source.

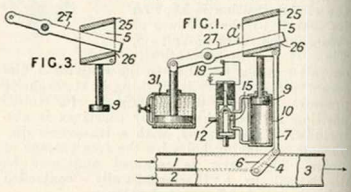
3923. Lees, W., Lees, T. W., and **Lees, A.** Feb. 16. [*Addition to* 25,569/07.]

Heating buildings. — In the apparatus for supplying a mixture of steam and air for circulation, described in the parent Specification, if the pressure of steam rises above the normal, the piston *f* is forced inwards along the chamber a^3 and the spindle d^1 into the injector cone. If the pressure falls, the reverse operation occurs. Steam enters past the valve *c* and



is admitted behind the piston *f* through the passage *h*, the pressure on the other face of the piston being that of the return main.

4270. Geissinger, H. G. Feb. 20.



Thermostats.—The movement of a regulating-valve is retarded during a portion of its travel in either direction, while the extent of its unrestrained movement varies with the position from which the valve is moved, the object being to obviate large oscillations of temperature due to the time lag in the operations of the thermostat. A valve 4, controlling hot and cold air supplies from ducts 1, 2 to a common duct 3, is operated by fluid under pressure admitted from a pipe 12 to an operating-piston 9 connected to the valve by links 6, 7. The fluid pressure from the pipe 12 is distributed by a piston control valve 15 operated by an electro-magnet under the control of a thermostat 19 situated in a room the temperature of which is to be regulated. A double-ended dash-pot 31 is connected to a lever 27, engaging between the inclined lugs 25, 26 of the head 5 mounted on the operating-piston 9. From the extreme position shown in Fig. 1, the valve may be moved unstrained through a distance *a* until the lug 25 strikes the lever 27, further movement being restrained by the dash-pot. From the opposite extreme position, obtaining in Fig. 3, the whole of the movement of the valve is under the restraint of the dash-pot. From intermediate positions of the valve the distances *a* of free movement vary with the respective positions of the valve.

4271. Geissinger, H. G. Feb. 20.

Thermostats.—Air to be supplied to rooms or a heating-system is passed through a heating-chamber 2 and a by-pass 4 in proportions controlled by a damper 10, actuated by a thermostat 18 placed in a chamber through which passes a mixture of the cold aid and the supplied air from pipes 21, 22, respectively, so as to be approximately at the desired temperature of the room. In the form of apparatus shown in Fig. 1, the proportions of cold air and supplied air admitted to the chamber 20 are controlled by a hand-valve 27, and the thermostat consists of two tubes having different coefficients of expansion, the free end of the inner tube actuating, through multiplying-levers, a rod 15 which actuates the air damper 10, and also a valve 7 controlling the supply of heating-fluid to the pipes 5. In another form, a bimetallic strip controls a reversible electric motor, actuating by screw-and-nut gearing a rod controlling the valve 7 and damper 10. In a third form, the blower is situated between the heater and the duct 1, and the valve 7 and damper 10 are actuated by a shaft driven in either direction by an electric motor through a reversing magnetic clutch controlled by a bimetallic-strip thermostat. Pneumatic control may also be used. The air may enter the blower through a washing-chamber. The mixture affecting the thermostat may be passed into the supply to the rooms. The system is applicable to cooling instead of heating apparatus.

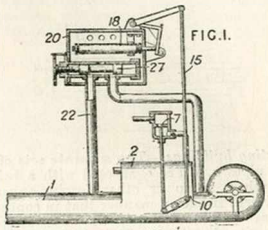
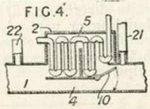


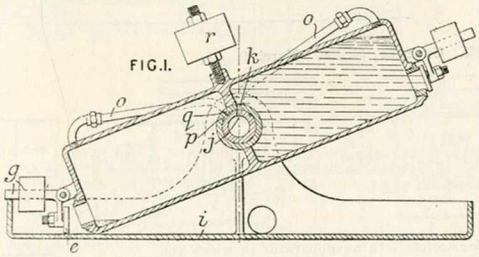
FIG.4.



5035. Ogden, J. E. L. Feb. 28.

Steam-traps.—A steam-trap for use at pressures either above or below atmospheric consists of a divided rocking vessel, each part of which is placed alternately in communication with both the water and the vapour spaces of the vessel to be drained and with the atmosphere. In the form shown, water enters at one end of a hollow bearing and passes through a port *j* and a corresponding port or series of ports *k* in a hollow shaft to the upper chamber, which is also in communication through a pipe *o* and a pair of apertures at the opposite end of the shaft and bearing with the vapour space. Meanwhile the lower chamber is in communication with the atmosphere through an aperture *q* and a groove *p* the water escaping through a valve *e*, which is opened either by the head of water or by the abutment of a weighted lever *g* against the raised part of a trough *i*. When sufficient water has collected in the upper chamber, the positions are reversed, this being controlled, if desired, by a balance-weight *r*. In a modification, the valves *e* are of the equilibrium type.

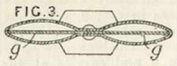
FIG.1.



5391. Hager & Weidmann Ges. March 3, 1910, [*Convention date*].

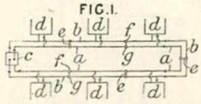
Radiators. — Elements made of sheet metal and having parts of elliptical or like cross-section are fitted with plates *g* or bars extending on the line of the major axes of these parts, to prevent deformation under internal pressure.

FIG.3.



5542. Griffiths, E., and **Darque, Griffiths, & Co.** March 6.

FIG. 1.



Heating buildings.—Two separate sets of hot-water pipes *a*, *b* are connected with a boiler *c* and with a pump or other forcing-apparatus (not shown) in such a manner that in contiguous portions of the two systems the water is flowing in opposite directions. If it is desired to cut out a building or part of a building *d*, three-way cocks *f*, *g* are turned so that the water flows through the cross-pipes *e* and then through the return pipe.

5608. Gobert, H., and **Meyer, P.** March 12, 1910, [*Convention date*].

Radiators.—Rooms are warmed by heated air under pressure passing through a radiator to which it gives up some of its heat and then into the room thereby ventilating the same. Air heated in an oven *a* is delivered by mains *c* and branch pipes *h* to radiators *g* situated in the rooms to be heated. The temperature of the air delivered is regulated by an injector device and a sliding sleeve, whereby a quantity of cool air may be mixed with the hot medium. The

FIG. 2.

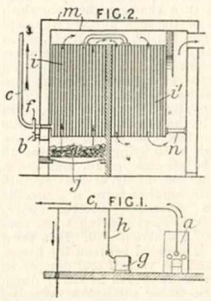
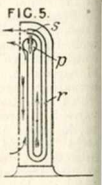


FIG. 5.



radiator comprises an horizontal pipe *p* communicating through screw valves with U-tubes *r*. The air is finally delivered to the room through nozzles *s*. The oven consists of a series of tubes *i*, *i*¹ through which air is circulated. The tubes are heated by hot gases rising from the grate *j*.

5982. Cramer, S. W. March 9.

FIG. 2.

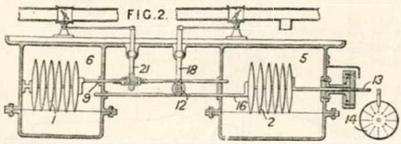
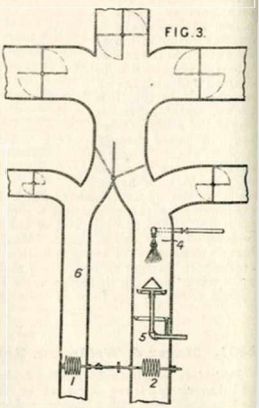


FIG. 3.

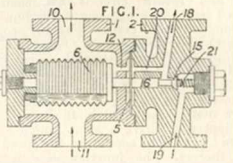


Thermostats.—In an apparatus in which the moisture and temperature of air are regulated by wet and dry thermometric elements, as in the apparatus described in Specifications 1769/06, 12,945/07, and 12,361/09, the thermometric elements consist of metallic shells containing expansible fluids and directly connected to a member which receives a motion proportional to the difference of the expansion of the two elements. Fig. 3 shows the dry and wet bulb elements 1, 2 placed in trunks 6, 5, the supply of air to which is controlled by dampers as shown. The air for the two elements may come from the same or different sources as desired, and a spray 4 is placed in the trunk 5. The thermometric elements consist of a series of shells, as shown in Fig. 2, which may communicate with each other or not. The dry-bulb element 1 is attached at one end to the wall of the trunk 6 and carries at the other end a rod 9, to which is adjustably connected a lever 21 operating a valve controlling the supply of

steam to a heating-device. On the rod 9 is formed a rack engaging with a pinion 12. The wet-bulb element 2 also carries a rod 16, on which is a rack engaging with the pinion 12. The pinion 12 is carried on a lever 18 operating a valve controlling the supply of water to the air-moistening sprayers; the movement of the lever 18 will be proportional to the difference in the expansions of the elements. To allow of adjusting the humidity, the element 12 is carried on a screwed rod 13, passing through a nut 14 with a graduated head.

6414. Pollard, F. A. March 26, 1910, [*Convention date*]. [*Addition to* 18,734/08.]

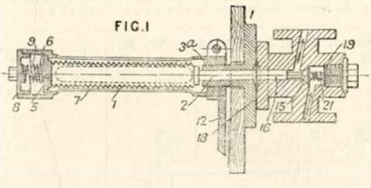
Thermostats.—In apparatus for the automatic regulation of liquefied-gas refrigerating-apparatus, such as that described in the parent Specification, the valve 15 controlling the flow of liquefied gas from the condenser to the refrigerator is operated by an expansible tube 6 containing some of the liquefied gas, and acting through a flexible membrane 5, the sides of which are in contact with the gas passing to and from the refrigerator. The membrane 5 is held between two casings 1, 2, the casing 1



having a passage 10 leading to the suction of the compressor and a passage 11 connected to the outlet from the refrigerator. The container 2 is fitted with a valve 15 having a rod 16, which is pressed against the membrane by a spring 21; a passage 19 is connected to the condenser outlet, and a passage 18 leads to the inlet of the refrigerator.

6415. Soc. Française des Wagons Aérothermiques. March 26, 1910, [*Convention date*].

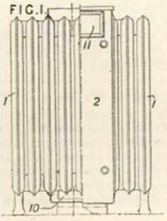
Thermostats.—A thermostat for regulating a supply of cooling or heating fluid, more particularly for use in a refrigerating-system, consists of an elastic tube 1 supported in a perforated casing 7, which screws on a bushing 3^a, and to which a pointer 12 is clamped by a band, a valve 15 being opened by the expansion of liquid in the tube, through a rod 2 passing through the bushing. The valve may otherwise be arranged so that it is closed by the expansion. The casing 7 carries a plug 8 with a spring 9 supporting a disk 5 on the tube 1, the disk being provided with a plug 6. A diaphragm 18 is interposed between the rod 2 and another rod 16 acting on the valve. A stop 21 limits the movement of the valve.



The Specification as open to inspection under Section 91 (3) (*a*) comprises also the use of alcohol or a solution of calcium chloride as the expansible liquid. The valve box may be placed in a shunt to a pipe conveying refrigerating-fluid to a chamber to be cooled, so that the thermostat regulates the quantity of fluid passing directly to the compressor. This subject-matter does not appear in the Specification as accepted.

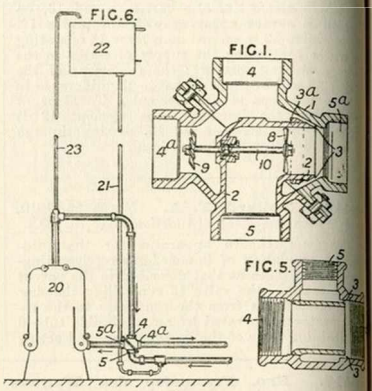
6791. Bourdon, C. April 4, 1910, [*Convention date*].

Radiators.—A part only of an ordinary heating radiator 1 is enclosed in a casing 2 which fits closely round certain of the elements. An inlet opening 10 communicating with the outside air and an exit opening 11 fitted with a regulator for heated air are provided.



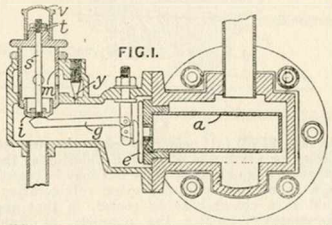
6813. Kite, C. F., and **Skelt, M. H.** March 18.

Heating buildings &c.—Apparatus for promoting circulation in a hot-water system comprises a junction piece through which the 'flow' and 'return' circuits pass, means being provided for by-passing some of the liquid from the 'flow' into the 'return' circuit; propelling-devices are also used, which are adapted to be driven by the 'flow' current. The junction piece 1, Fig. 1, has a sleeve 2 with adjustable piece 3^a forming a by-pass 3 from the 'flow' 4, 4^a to the 'return' 5, 5^a. A shaft 10 carries a screw motor 9 situated in the 'flow' circuit and adapted to drive a screw pump 8 in the 'return' circuit to accelerate the speed of the water therein. The junction-piece is in two parts adapted to be easily bolted together. In modifications, two screw motors are used to drive the screw fan, or the fan may be driven by an electric or other independent motor, or in other cases the screw pump may be dispensed with. When the junction-piece is for use with radiators, is has three pipe connexions, as shown in Fig. 5, the junction-piece being enlarged around the sleeve to allow the return water from the radiator free access to the by-pass. The circulator is preferably inserted in the system near the boiler 20 at the end of the return pipe, as shown in Fig. 6. The feed-pipe 21 for the system leads from a cistern 22,



which also receives water from expansion pipe 23 of a low-pressure system.

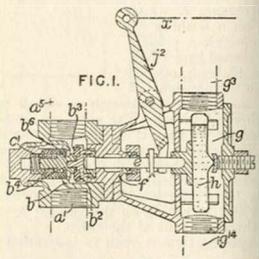
7210. Davis, H. N., and **Twigg, W. R.** March 22.



Thermostats.—Apparatus for controlling the gas supply to a burner for heating water in a circulating system, consists of a container *a* located in a part of the system, and an expansible chamber *e* outside, both being filled with oil or other liquid, a ported piston valve *i* being operated through a lever *g*. The valve seat consists of an adjustable screwed sleeve *m*. The valve is carried by a stem *s* with lock-nuts *t* to limit its movement inside a cap *v*. A by-pass *y* is provided.

8338. Laycock, W. E., and **Wild, A. G.** April 3.

Heating vehicles; thermostats.—In apparatus for heating railway-carriages &c., of the type in which the supply of steam to a radiator in the carriage is controlled by a thermostatic diaphragm exposed to the exhaust steam, the diaphragm is made of a circular form and placed with its axis at right-angles to the path of the steam. Means are also described for shutting-off the steam from within the carriage. The diaphragm

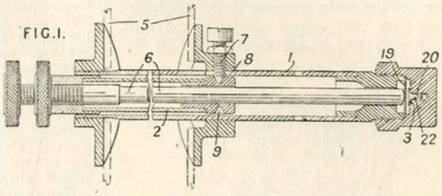


h is contained in a chamber *g* with a steam inlet g^3 and outlet g^{14} at diametrically opposite points. The diaphragm *h* bears against a rod *e* passing through the stuffing-box *f* and carrying at its other end a valve consisting of a disk b^2 with a vulcanized fibre ring b^3 to bear on a seating *b*. The ring b^3 is held in place by a nut b^4, provided with a collar against which presses a spring c^1. The valve controls the passage of steam from the inlet a^1 to the outlet a^5, and a wire-gauze cylinder b^6 is provided to prevent grit &c. from getting into the valve. The valve can also be closed by a lever j^2 and chain *x* communicating with the inside of the carriage.

8513. Kitson Empire Lighting Co., and **Noblett, A.** April 5.

Thermostats. — A thermostatic device for use in vapour-burning apparatus, of the type described in Specification 13,785/02, [*Class* 126, Stoves &c.], allowing oil to pass only when a vaporiser is at a sufficient temperature, comprises two or more concentric tubes arranged externally to the vaporiser and connected together and to a valve-rod so that the amount of effective movement of the valve-rod relatively to the valve seating is dependent upon the number of tubes employed. In an arrangement having two tubes, the outer tube 1 is provided with the valve seating 3 at one end and is secured at the other end to the casing 5 of the vaporizing-apparatus. The inner tube 2 is attached at one end to one end of the valve-rod 6 and at the other end to the casing 5 by a screw 7 passing through a longitudinal slot 8 in the tube 1 and engaging an annular groove 9 in the tube 2. The valve-rod 6 acts directly or through a steel or other flexible diaphragm 19 on a valve 20 having the portion 22 within the oil inlet of conical shape so as to cause the oil to have a cleaning action on the valve and its seating.

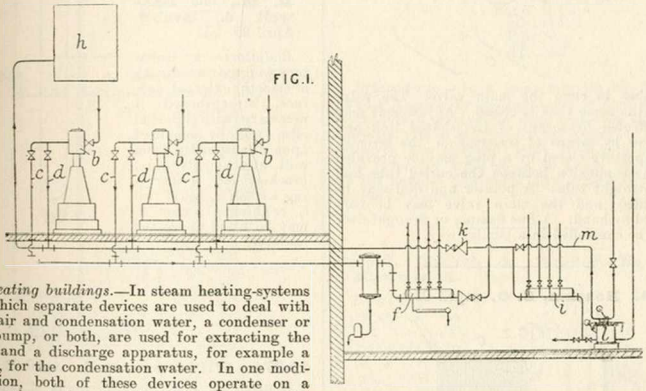
FIG. 1.



9611. Nesbit, D. M. April 20.

Heating buildings.—In steam heating-systems in which separate devices are used to deal with the air and condensation water, a condenser or air-pump, or both, are used for extracting the air, and a discharge apparatus, for example a trap, for the condensation water. In one modification, both of these devices operate on a separating-tank into which the return from the system delivers. In the form shown in Fig. 1, a condenser *h* acts directly on one portion *d* of the exhaust from a set of engines *b*, the other portion *c* delivering to the distribution drum *f* of a heating-system. The return drum *i* of the system delivers into the trap *l* discharging water into a heater, and is also in communication through the pipe *m* and vacuum reducing-valve *k* with the condenser *h*. Specifications 25,234/02 and 24,573/10 are referred to.

FIG. 1.



9612. Jennings, F. W. April 20.

Thermostats.—A Bourdon tube operates two pilot valves to control a diaphragm valve for admitting steam or liquid to a heater or radiator, or for other purposes. A straight tube *a*, Fig. 4, containing expansible liquid such as alcohol, is located in a heater *c*, and connected with a Bourdon tube *d*, Fig. 1, operating two pilot valves *n*, *h* through a slotted link *f*, adjustable pin, and lever *g*. When the temperature in the heater is below normal, the valve *n* is opened against the action of a spring *p* and opens the diaphragm chamber of the main valve *l* to the atmosphere, thereby allowing springs *m* to open the valve *l* to admit heating-

fluid. During this time, the valve *h* is closed, but when the temperature is excessive, the valve *h* opens and admits water, steam, or other medium under pressure to the diaphragm

FIG.1.

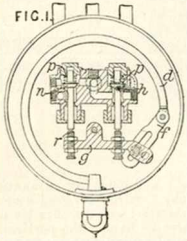
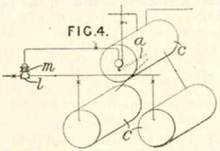


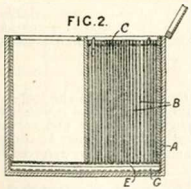
FIG.4.



chamber to close the main valve. The valve *n* at the same time is closed. Adjustment may be effected by means of the slotted link and pin, or by means of screws *r* on the lever *g*. An aperture closed by a plug may be provided in the connexion between the curled tube and the straight tube. A pointer and dial may be provided, and the main valve may be controlled by hand. A flue damper or draught door may be controlled in a similar way.

9794. Bastian, C. O. April 22.

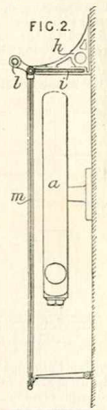
FIG.2.



Heat-storing apparatus.—Heat produced electrically is accumulated in a mass of divided material enclosed in a casing, so that the heat may be given up to air at a high rate by passing it through the divided material, which may be metal plates, turnings, chips, or powder, or sand, or a metallic salt. In the form illustrated a number of aluminium or other plates B, Fig. 2, are spaced by steatite washers on bolts C. One or more blocks of plates thus formed are contained in a box with double walls. The plates may be slotted to receive an electric heater, or the heater G may be situated beneath an openwork support E for the plates. One or more air inlets and outlets are provided, and may be controlled independently or simultaneously by valves. An automatic switch and a valve may be provided to prevent the temperature from rising above a predetermined limit. The plates may be adjustably mounted. The hot air may be circulated through pipes, or passed into ovens, or used for heating water.

Non-conducting coverings. — The space between the double walls of the box contains sheets of polished metal, or the walls may be of wood with a polished metal lining. Specification 1924/83 is referred to.

FIG.2.



10,028. Nesbit, D. M., and **Ashwell & Nesbit.** April 25.

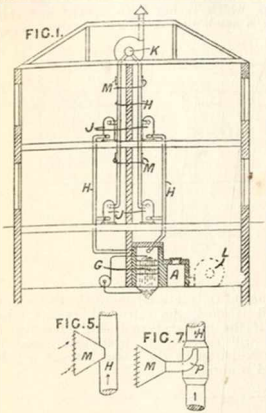
Radiators.—A radiator *a* is constructed with a smooth external surface, strengthened if necessary with internal ribs, and is mounted upon or suspended from wall attachments only, brackets &c. *h* carrying a shelf *i*, towel rail *l*, or hinged screen *m* may be fitted above the radiator.

10,274. Williamson, F. E. April 28.

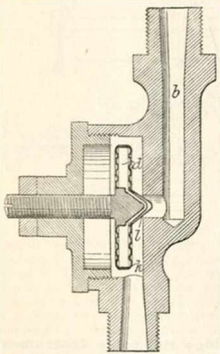
Heating buildings &c.—Products of combustion from a furnace A, or waste hot gases are diluted with steam or other gases by passing over suitable solutions sprayed into a chamber G and then circulated through a system of radiators J arranged 'in parallel' by forcing or induction by a fan or the like at L or K. The radiators may be used for heating buildings or for industrial heating. Rooms heated by this system may also be ventilated by the use in the conduits H of valves, such as M, Fig. 5, in the case of induced circulation, or M, Fig. 7, when forced circulation is employed. In the latter case, the air of the room is abstracted through an ejector nozzle P.

(*For Figures see next page.*)

10,274.

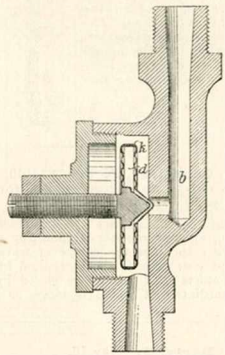


10,844. Still & Sons, W. M., Still, E. H., and **Adamson, A. G.** May 4.



Steam-traps.—In a steam-trap in which the inlet *b* is closed by the expansion of fluid in a capsule *d*, the front wall of the capsule is protected by an affixed jacket *k*, having a valve-piece *l*, preferably separated from the front wall of the capsule by an air-space to make the trap less sensitive. The capsule may or may not have the conical front wall shown. The jacket *k* may extend around the edge and overlap the rear wall of the capsule so as to protect the soldered joint from the steam.

10,845. Still & Sons, W. M., Still, E. H., and **Adamson, A. G.** May 4.



Steam-traps.—In a steam-trap in which the inlet *b* is closed by the expansion of fluid within a capsule *d* having its edge free, the edge is covered with a tightly fitting jacket *k*, which protects the soldered joint from the steam and grips the walls so as to lessen the stress at the angles. The cover may extend inwardly as far as desired.

11,317. Bickel, A., Roeder, H., and **Hartwig, R.** May 10.

Heating-apparatus.—A vessel 1 for solids or liquids jacketed with a non-conducting covering 4 is fitted with a cup-shaped lid 6 bearing a depending tube or tubes 8 for heating or cooling. The space between the lid 6 and cover 7 may be filled with a non-conductor as shown or may carry some heating or cooling medium. This medium may be the same as or different from the means in the tube 8. The tube 8 may contain any source of heat.