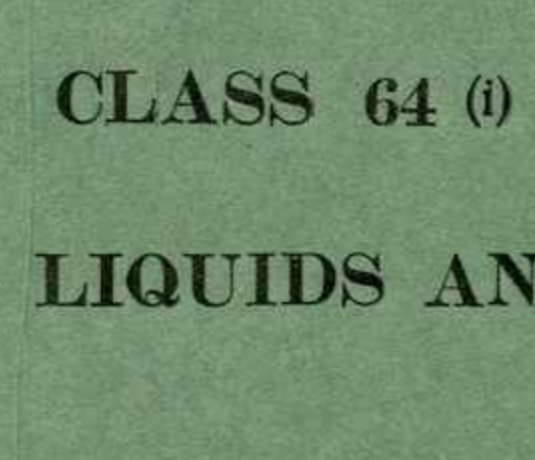
PATENTS FOR INVENTIONS

ABRIDGMENTS OF SPECIFICATIONS

CLASS 64 (i)

HEATING LIQUIDS AND GASES

PERIOD—A.D. 1926-30 [244,801—340,200]



LONDON
PRINTED UNDER THE AUTHORITY OF HIS MAJESTY'S STATIONERY OFFICE
BY THE COURIER PRESS, BEDFORD STREET, LEAMINGTON SPA
PUBLISHED AT THE PATENT OFFICE, 25, SOUTHAMPTON BUILDINGS,
CHANCERY LANE, LONDON, W.C.2.

1933

Price 2s. 0d. [inland]. Postage abroad extra.

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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 classfication of the subject matter of inventions, reference should be made to the *Abridgment-Class and Index Key* (*Vol. I*), published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.2, price 7s. 6d. (inland); 8s. 1d. (abroad).

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by hot solids and molten materials. [*No cases.*]

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Heating water &c.—*cont.*

heating by hot solids &c.—*cont.*
by steam and hot gases—
circulating through pipes and tubes. 244,859. 248,624. 248,897. 250,762. 265,597. 270,537. 271,701. 273,113. 283,739. 288,650. 289,237. 292,296. 297,148. 310,157. 312,112. 316,918. 324,940. 325,770. 331,944. 333,527.
contained in jackets and other enveloping-vessels. 252,373. 272,623. 292,070 316,699. 326,440. 331,944.
other than in jackets and pipes. 250,169. 255,418. 276,761. 278,133.
Perkins and like closed tubes, constructions of and fillings for. *See* Heating systems &c., [*Class* 64 (ii)].

incrustation and corrosion, preventing and removing. *See* Incrustation &c., Preventing &c., [*Class* 123 (i)].
injectors. *See* Injectors &c., [*Class* 71].
kettles, saucepans, and like hollow-ware. *See* Hollow-ware, [*Class* 66].
miscellaneous—
heating by friction. 260,094. 297,158.
motor-vehicle internal-combustion engines, heat from, utilizing for. *See* Cooking, boiling, &c. apparatus, Heat from motor-vehicle internal-combustion engines, Utilizing for, [*Class* 28 (i)].
pipe and tube joints and couplings. *See* Pipes and tubes, Joints &c. for, [*Class* 99 (i)].
pipes and tubes, cleaning. *See* Pipes and tubes, Cleaning, [*Class* 99 (ii)].
pipes and tubes for, metal. *See* Pipes and tubes, Metal, [*Class* 99 (ii)].
pressure gauges. *See* Barometric &c. gauges, [*Class* 106 (ii)].
pressure-relieving devices for fluids. *See* Pressure-relieving devices &c., [*Class* 135].
pumps, heating liquid during passage through. *See* Pumps, Reciprocating, &c., [*Class* 102 (i)].
pumps modified for. *See* Pumps, Reciprocating, &c., [*Class* 102 (i)].
regulating heating, thermostats for. *See* Thermostats &c., [*Class* 64 (ii)].
safety arrangements, (*other than* safety-valves *and* pressure-relieving devices for fluids). 260,753. 329,060.
fusible plugs. *See* Steam generators, [*Class* 123 (ii)].
safety-valves. *See* Valves &c., [*Class* 135].
spray-producers and liquid-distributing nozzles, construction of. *See* Spray-producers &c., [*Class* 69 (iii)].
stove fittings for heating. *See* Stoves &c., [*Class* 126].
stoves and fireplaces, not solely for heating liquids, arrangement and disposition of boilers in. *See* Stoves &c., [*Class* 126].
stuffing-boxes. *See* Stuffing-boxes &c., [*Class* 122 (v)].
submersible heaters. 248,146.
surface-apparatus for effecting transfer of heat otherwise than from combustion products, construction of. *See* Surface-apparatus &c., [*Class* 64 (iii)].

Heating water &c.—*cont.*
tanks and cisterns, of interest apart from heating water, construction of. *See* Tanks &c., [*Class* 69 (i)].
thermostats. *See* Thermostats &c., [*Class* 64 (ii)].
vacuum pans. *See* Distilling &c. liquids, [*Class* 32].
valves and cocks, arrangement and disposition of. *See* water supply &c. *below*.
valves and cocks, construction of. *See* Valves &c., [*Class* 135].
waste heat, utilizing. *See* feedwater &c., heating, (misc.) *above*.
water-circulation, promoting in systems. *See* general arrangement &c. *above*.
water-circulation, utilizing for motive-power purposes. *See* Turbines, Hydraulic, [*Class* 110 (iii)].
water, purifying and softening. *See* Water &c., Purifying &c., [*Class* 46].
water supply and delivery, (*including* arrangements of valves and cocks for). 247,749. 253,847. 255,631. 260,753. 263,513. 266,048. 269,326. 279,753. 283,299. 283,433. 287,704. 298,413. 298,414. 304,590. 308,195. 309,082. 313,796. 317,777. 322,055. 327,314. 329,210. 332,068. 332,401. 333,869. 337,991. 339,475. 339,734.
interconnecting gas and water valve mechanically. *See* Valves &c., [*Class* 135].
valves, construction and actuation of. *See* Valves &c., [*Class* 135].
wheeled water-heaters for field, camp, and like use. *See* Cooking-apparatus, Field &c., [*Class* 28 (i)].

Washing-boilers and setpans.
Excepting Cauldrons, Asphalt, snow-melting, gravel-heating, and like, (*including* Plant for making tar macadam). [*Class* 107].
alloys for. *See* Alloys, [*Class* 82 (i)].
baths, modified for use as. *See* Baths, [*Class* 26].
burners for heating. *See* Burners &c., [*Class* 75 (i)].
chimneys and flues not forming part of boiler or pan settings. *See* Chimneys &c., [*Class* 25].
circulation, promoting. 249,009. 250,483. 250,762. 252,172. 254,995. 256,336. 270,568. 274,855. 285,246. 286,854. 288,332. 296,525. 307,884. 313,345. 318,579. 319,298. 330,358. 336,963. 337,763.
coverings and compositions, nonconductors of heat. *See* Nonconducting coverings &c., [*Class* 64 (ii)]; Plastic compositions, [*Class* 70].
electroplating. *See* Electrolysis &c., [*Class* 41].
frothing, preventing, (*other than* circulation, promoting). 324,035.
furnaces for. *See* Furnaces &c., Combustion apparatus of, [*Class* 51 (i)].
gas supply for heating, controlling, arrangements and applications of valves for. *See* Burners &c., [*Class* 75 (i)].
heating by electricity. *See* Heating by electricity, [*Class* 39 (iii)].

Washing-boilers &c.—*cont.*
heating liquids by direct contact with steam and other gases. *See* Heating water &c.; kinds &c. *below*.
heating-surface, modifications of, (*including* structural alterations to bottoms of pans). 265,597. 285,246. 293,621. 318,004.
hinges for lids. *See* Hinges &c., [*Class* 65 (ii)].
incrustation and corrosion, preventing and minimizing. *See* Incrustation &c., Preventing &c., [*Class* 123 (i)].
kinds or types—
fire-heated. 249,009. 254,995. 256,336. 286,854. 287,733. 324,035.
gas and oil heated. 245,611. 246,398. 256,336. 258,722. 273,578. 279,753. 282,277. 285,246. 286,854. 286,942. 288,332. 306,209. 318,004. 321,836.
injection of steam, heated by. 296,525. 317,421. 336,963.
internal tubes and chambers, heated by. 248,897. 250,762. 265,597. 273,578. 307,884. 313,345.
jacketed, steam and like, (*other than* water-bath and like indirectly-heated pans). 265,597. 273,578. 284,281. 290,496. 336,421.
water-bath and like indirectly-heated pans. 270,364. 304,916. 319,298. 319,391. 336,421.
lids specially modified and adapted for. 245,611. 252,172. 274,855. 279,160. 282,277. 286,854. 288,332.
condensers for vapours. *See* vapours, consuming &c. *below*.
lids not specially modified for. *See* Hollow-ware, [*Class* 66].
liners, baskets, and like arrangements for holding goods treated—
fixed. [*No cases.*]
removable. 249,009. 252,172. 256,336. 274,855.

Washing-boilers &c.—*cont.*
liquid supply and delivery. 274,855. 279,753. 282,277. 285,246.
making by electrodeposition. *See* Electrolysis &c., [*Class* 41].
making by operations of interest apart from washing-boilers and setpans. *See separate headings*, *such as* Casting metals, [*Class* 83 (i)].
materials of pans. 284,281. 337,313.
miscellaneous—
compartments in pans. 285,246.
mixing and agitating appliances. *See* Mixing and agitating machines &c., [*Class* 86].
plastic compositions for. *See* Plastic compositions, [*Class* 70].
preserving-pans, feeding. *See* Jam &c., [*Class* 49].
pyrometers for. *See* Thermometers &c., [*Class* 97 (iii)].
riveted joints for. *See* Riveted joints, [*Class* 83 (iv)].
settings and supports—
flues, arrangement of. 246,398. 258,722.
other than arrangement of flues, and rims and like supports. 251,785. 273,578. 276,209. 276,563. 286,854. 286,942. 287,733. 306,209. 319,675. 321,836.
rims and like supports. 282,277. 314,214. 321,836.
stirrers or agitators for laundry articles. *See* Washing, Domestic &c., [*Class* 138 (ii)].
stoves for. *See* Stoves &c., [*Class* 126].
valves and cocks, construction of. *See* Valves &c., [*Class* 135].
vapours, consuming and trapping. 245,611. 249,009. 253,748. 256,793. 270,059. 282,277. 321,836. 337,763.
water-level indicators. *See* Water &c. levels, Regulating &c., [*Class* 123 (i)].

NAME INDEX

The names of Communicators and Assignors are printed in *Italic* type.

ERRATA

Page 106. Abridgment No. **305,564.** *For* British Area Regulators, Ltd., *read* British Area Regulators, Ltd.

Page 133. Abridgment No. **325,697.** *For* Howden & Co., Ltd. *read* Howden & Co., Ltd., J.

The following abridgments should be *deleted*:—**261,514. 326,601.**

CLASS 64 (i)

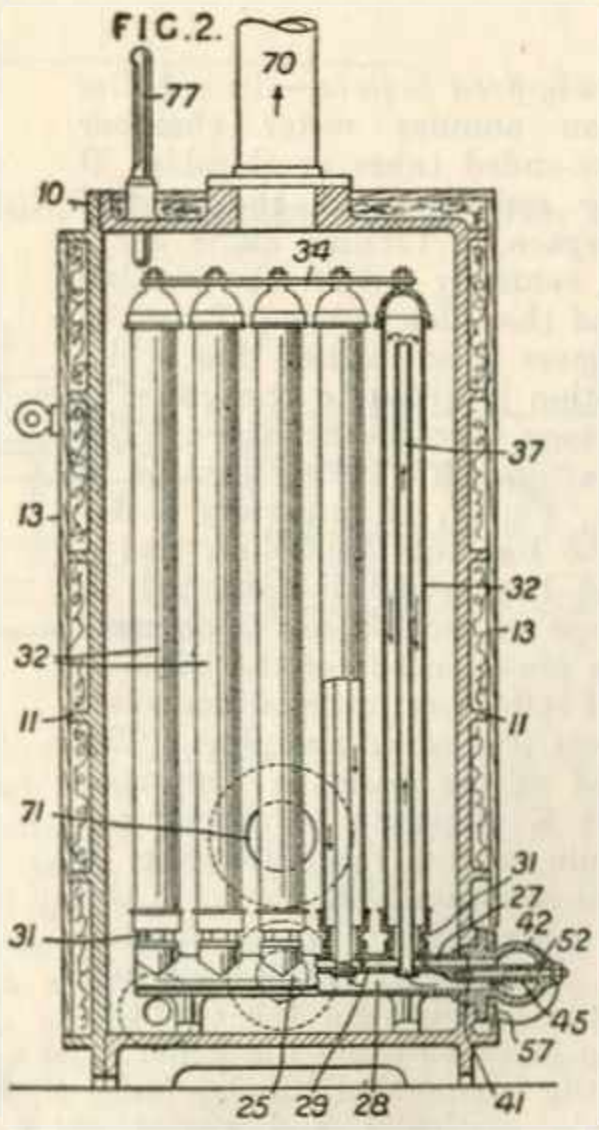
HEATING LIQUIDS AND GASES

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.

244,859. Morton & Co., Ltd., R., and **Robinson, P.** Oct. 16, 1924.

Heating liquids.—In a water heater in which steam is passed through tubes in the water, the headers and connected parts are arranged to permit easy detachability. The container 10 is of rectangular form, with external ribs 11 to support a lagging material, and a wooden covering 13. One of the sides is detachable or may be hinged. A number of tubular headers 25 are each formed with upper and lower passages 27, 28, and tubes 32 are mounted on the upper sides of the headers by connecting members 31. The tubes 32 are closed at their upper ends, which are secured to a bar 34, and each contains an inner tube 37 secured to the dividing plate 29 of the header. One end of the header is closed, and the other end is adapted to be secured against the face 41 of a transverse supply and discharge conduit 42 by means of a bolt 52. The conduit 42 is divided by a partition 45 into two passages for supply and discharge of steam, the partition being thickened to receive the securing bolt 52. The conduit 42 is secured by studs and nuts 57. Each of the headers with its heating pipes, can be removed as a unit. Cold liquid is supplied by a pipe 71 and hot liquid drawn off by a pipe 70. A thermometer 77 is provided.

FIG. 2.



244,930. Clarkson, T. Jan. 16, 1925.

Internally-fired boilers.—In a boiler having an annular water chamber with close-ended tubes or thimbles projecting radially into the central heating space as described in Specification 108,177, the heating gases pass upwardly to a central outlet and a cylindrical baffle is placed centrally in the heating space to direct the gases into contact with the thimbles. The heating

500. Wt. 129/1016. 12/29. C.P.Leam. Ps 2349.

gases may be led into the boiler through a helical passage in a plug D, Fig. 1, of refractory material, and a liquid-fuel burner may be mounted in the passage to provide auxiliary heating. The lower end of the cylindrical baffle E^3 is formed of refractory material and rests upon a boss D^4 formed on the plug. The upper end of the baffle is supported by a bolt F engaging a bridge-piece F^1 extending across the outlet flue A^4. A cylindrical partition G is placed in the annular water space. In modifications a cylindrical baffle formed either of metal or refractory material and extending from the top to the bottom of the flue space between the thimbles is suspended from the top of the boiler casing. A superheater may be placed in the flue space above the thimbles. The baffle U, Fig. 4, is hollow and has bottom perforations U^4 through which air for combustion is delivered to the furnace. The air is supplied through a tube U^2 serving to suspend the baffle from a bridge-piece extending across the outlet flue.

FIG.1.

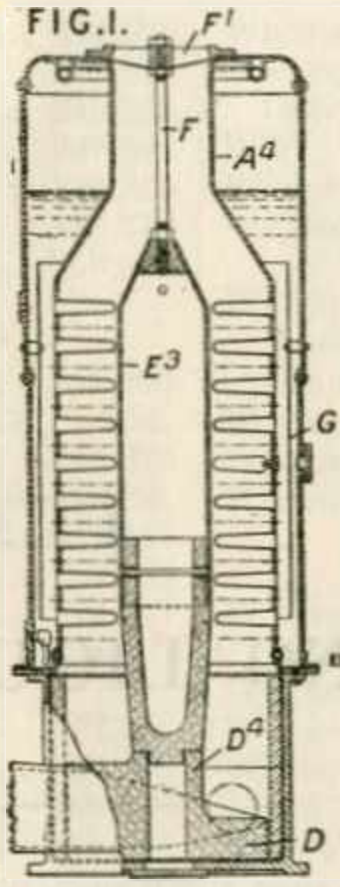
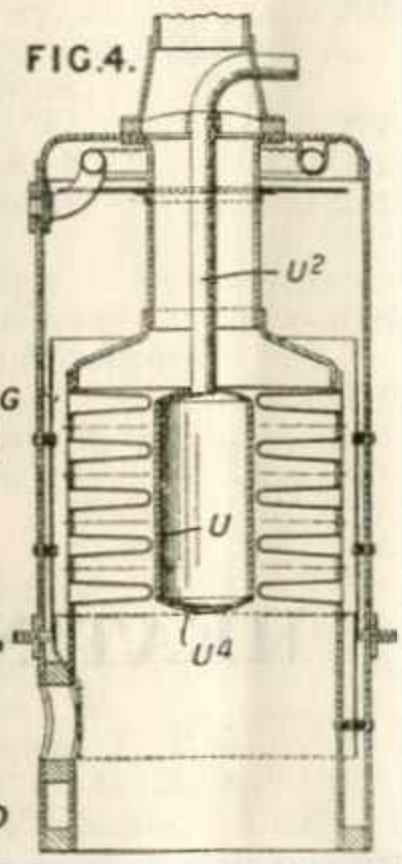


FIG.4.



244,931. Clarkson, T. Jan. 16, 1925.

Internally-fired boilers.—In a boiler having an annular water chamber with close-ended tubes or thimbles D projecting radially into the central heating space, a tubular baffle J^3 is mounted centrally within the heating space, and the inlet passage H for the heating gases is so formed that a circular motion is given to the gases in their passage over the thimbles. The gases pass through a helical passage in a plug G, Fig. 1, of refractory material in the base of the boiler, and a liquid-fuel burner H^1 is mounted in the passage to provide auxiliary heating. The lower end J^2 of the baffle is formed of refractory material and rests upon a boss formed on the plug. The upper end of the baffle is supported by a bolt K engaging a bridge-piece K^1 extending across the outlet flue. A cylindrical partition M is placed in the annular water space. Interconnected valves L, L^1 in the inlet passage and in a by-pass H^2 control the quantity of heating gases entering the boiler. In a modification, the open-ended tubular baffle S, Fig. 2, is movable vertically and serves as a valve member for directing the heating gases either around the thimbles or through the baffle to the outlet flue. The baffle rests on a conical member T, and, when raised, closes the passage between the boiler heating space and the outlet flue.

FIG.1.

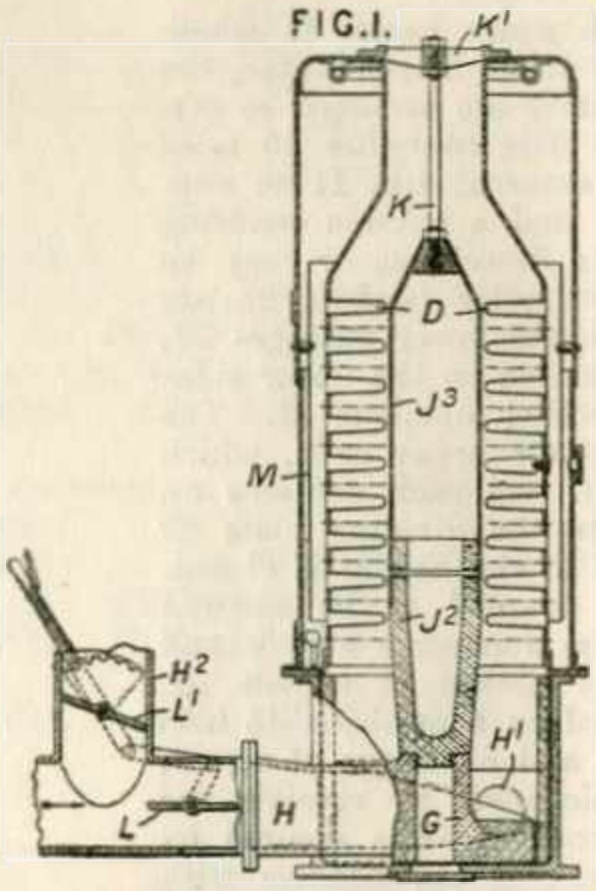
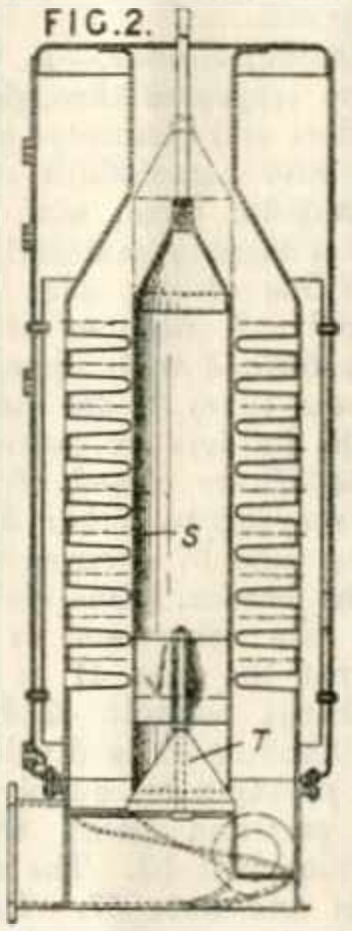
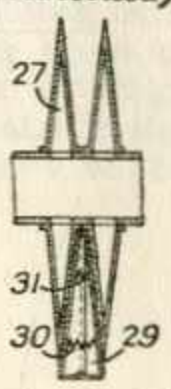


FIG.2.



245,111. Sandberg, A. Dec. 19, 1924, [*Convention date*].

FIG. 10. *(Cancelled)*



Feedwater, heating. — Apparatus of the type in which two different heat exchanging media flow through separate alternate passages between spaced discs comprises rotatable discs mounted on a shaft in a casing and provided with scrapers.

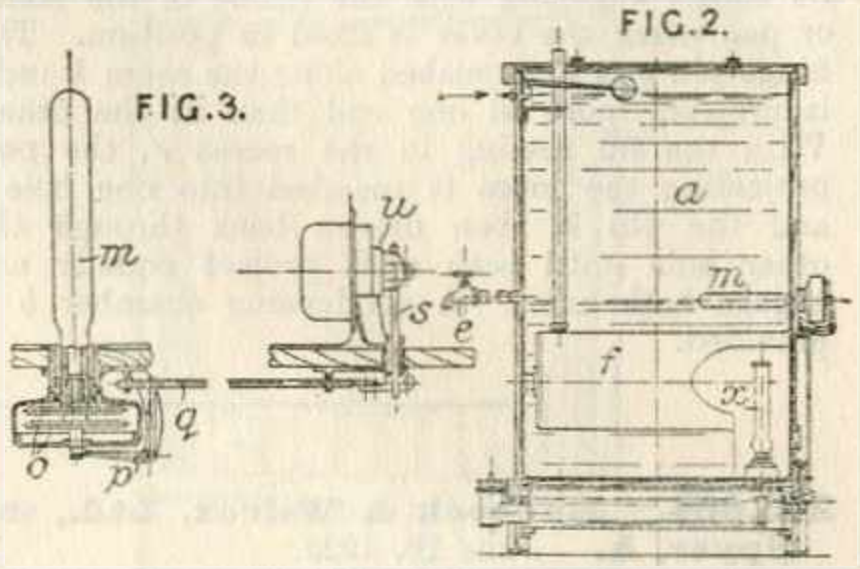
The Specification as open to inspection under Sect. 91 (3) (a) comprises also a form in which hollow discs 27, Fig. 10 (*Cancelled*), are mounted on a hollow shaft through which a third medium such as feedwater is led. Scrapers 29 in this form comprise two parts separated by springs 30, 31. This subject-matter does not appear in the Specification as accepted.

245,214. Beldimano, A. Oct. 6, 1924.

Heating liquids; internally-fired boilers. — A liquid heater comprises a cistern *a* which may be corrugated, a combustion chamber *f* projecting into the cistern, an oil burner *x*, a valve controlling the supply of air to the burner, an automatic governor closing the valve as the liquid reaches a predetermined temperature and a discharge tap *e* so disposed that the liquid cannot be discharged below a level sufficient to operate the thermal element *m* of the governor. The element *m* is in communication with expansible capsules *o* which operate a cross-rod *s* through link-work *p*, *q*. The cross-rod *s* bears a tumbler-

FIG. 2.

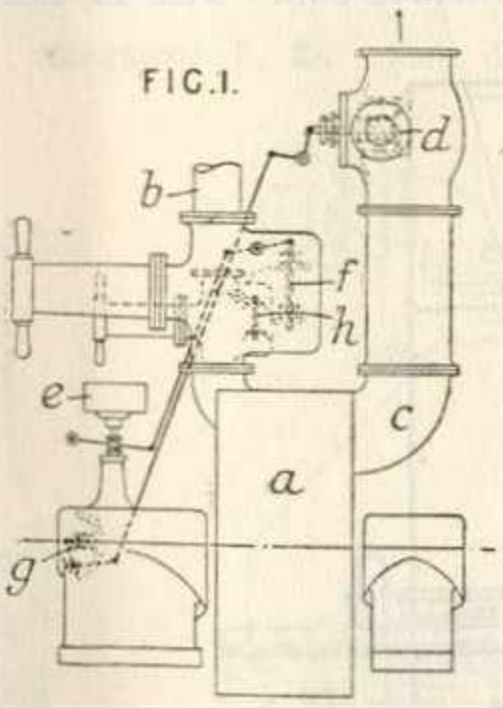
FIG. 3.



weight which tends to open or shut the air-valve *u* definitely. The heater is lagged externally and this lagging may be made in removable sections or in a plurality of layers so that if desired, for warming the room in which it is placed, portions or a layer of lagging may be removed.

245,320. Kirkland, J. W., (*Allgemeine Elektricitäts-Ges.*). April 2, 1925.

FIG. 1.



Feedwater, heating.—In a turbine plant employing an auxiliary turbine controlled by two speed-governors, *e*, *g*, and supplying steam by a pipe *c* to a feedheater, one governor *g* controls an additional live-steam inlet *h*, on the speed dropping below a certain limit, and at the same time, in order to avoid inadmissibly high feedwater temperatures, operates a blow-off valve *d*, which diverts a portion of the exhaust steam, which would otherwise have gone to the feedwater heater, to other points of consumption, such as an additional feedwater heater, or to the condenser.

245,588. Hülsmeyer, C. July 14, 1924.

FIG. 1.

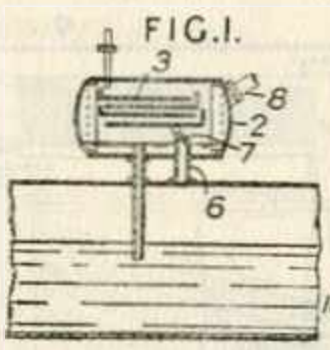
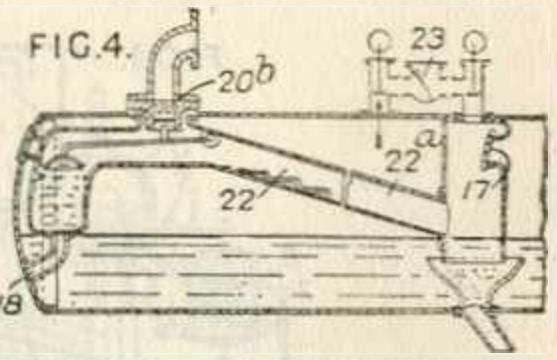


FIG. 4.

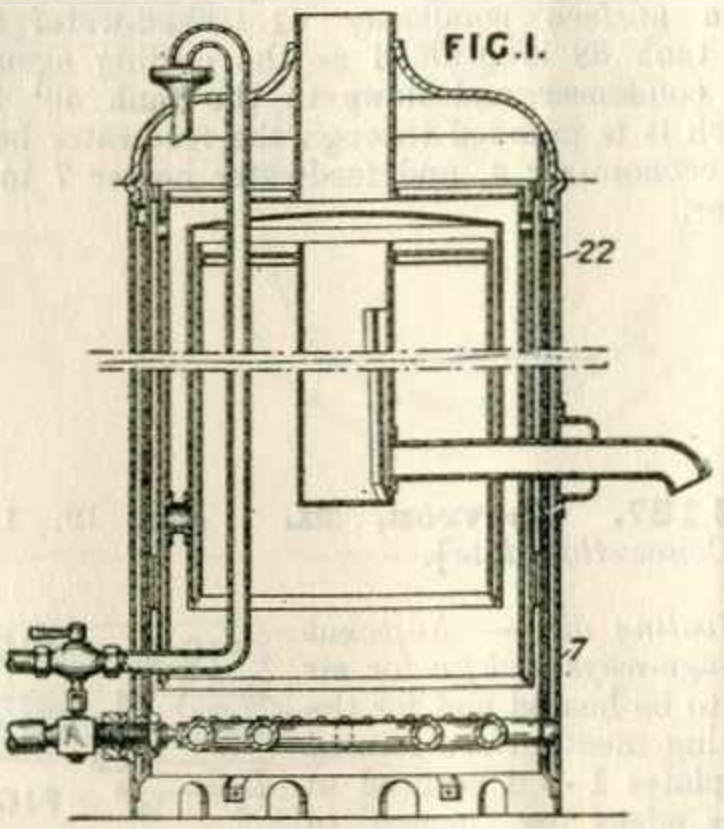


Feedwater, heating.—In apparatus of the kind in which feed is led into a chamber 2, Fig. 1, in communication with the boiler and containing one or more trays or plates 3, a non-return valve 7 is fitted in the steam inlet pipe 6, and steam and gases are led off from the chamber through a pipe 8. The feed may be sprayed against a plate in the chamber. The chamber may be placed inside the boiler and open into a mud collector at the bottom of the boiler. Feed enters a **U**-shaped chamber 22, Fig. 4, inside a boiler through a pipe 18 and flows down an inclined passage 22^a into a compartment fitted with a non-return valve 17 through which boiler steam enters the chamber. A float-operated valve 20^b in the outlet for the steam and gases is opened by the rise of the water level in the chamber. A non-return valve 23 in a duct outside the boiler may be used in place of the valve 17.

in washing the dishes. The water is heated by means of inverted **U** tubes 61, each having a gas burner 62 located beneath one of its limbs. The hot gases of combustion passing through the tubes heat the water and are drawn along the passage 63 and past the dishes to be dried. In a modified form of water heater the **U** tubes are replaced by straight tubes converging at the top the gases coming directly under the dishes. In both arrangements, the hot gases may be mixed with fresh air. Specification 228,480. [*Class* 138 (i), Washing and cleaning buildings &c.], is referred to.

246,547. Andrews, W. F., Tarper, A. H., and **Hellyer, R. H.** Oct. 22, 1924.

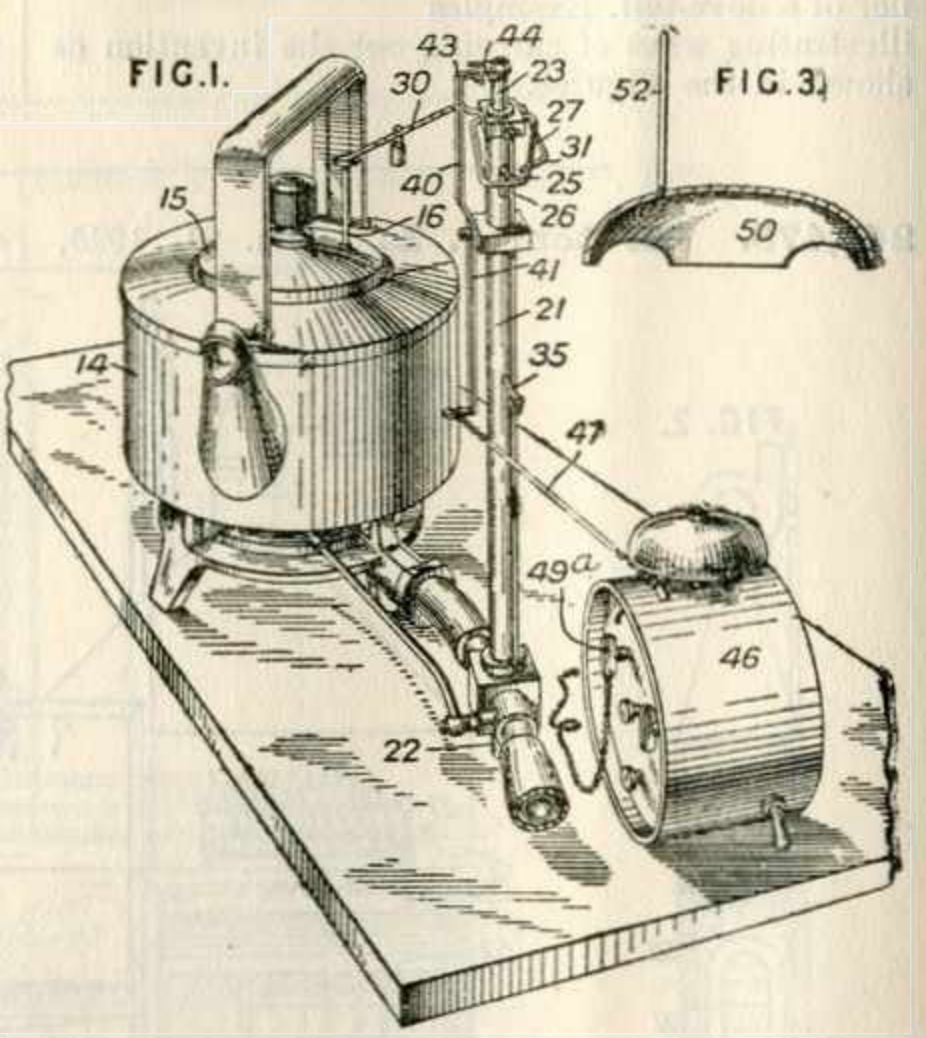
Internally-fired boilers; geysers.—A gas-heated geyser is provided with an outer jacket having a protective coating of vitreous enamel. In the example shown, an iron sheath 7, coated with the enamel, surrounds the water holding elements and may be heat insulated therefrom as by asbestos sheeting 22, and/or an air space, suitable



openings at top and bottom permitting an air circulation.

246,605. Lambert, F. T. Nov. 15, 1924.

Portable heaters.—The container 14 for liquid has a heating means controlled by the movement of an actuating member 15 or 50 moved directly by the heated liquid or the vapour therefrom, and so shaped as to have between it and the bottom of the container a free space for the movement of the liquid or vapour. The connecting element, shown as the lever 30, 31, of the control mechanism tends to move under gravity from a first position (for example an " on " position) to a second position (for example " off "), and is supported upon the actuating member so as to be tripped thereby and fall into the second position. In the example shown, the control mechanism comprises a vertical tube 21 mounted on the body of a gas-cock and having an extension 22. A rod 23 sliding in the tube has a transverse hole at its lower end through which gas passes when the hole registers with the gas-tube. A pin 25 on the rod slides in a slot 26 in the tube to limit the motion, the gas being shut off when the rod is down. If it is desired that the boiling of the water in the container should shut off the gas, the rod 23 is raised until the pin 25 is supported by the detent 27, the gas then being on. On boiling, the rocking of the lid 15, or other actuating member, causes the arm 30 to fall off the support 16 or 52 and moves the detent 27 from the pin 25, allowing the rod 23 to fall in the tube. By the use of stops 35, the rod may be allowed to fall only enough to reduce the flame. For starting the heating at a predetermined time, an alarm clock 46 has a tie 47 connected to the hammer. On movement of the latter, a lever 40, 41 will be rocked and the end 43 will release a fork 44 which up to this time has held the rod



23 in a raised " off " position above the " on " position. The rod then falls till the pin 25 engages the detent 27 and the heating of the kettle proceeds as before. The handle 49a of the clock may be used to withdraw the pin 35 if such has been used. The actuating member may be a lid, baffle or float. A spring-loaded rotary plug gas cock or electric switch may be released by the lever 30, 31 in place of the device described.

246,676. Nelson, W. Feb. 12, 1925.

Heating air.—An air heater of the type in which the heat-exchanging media pass through alternate chambers formed by partitions F on a casing A, the chambers being subdivided into compartments by strips G, is constructed so that the strips G terminate at different heights in the end passages so as to distribute the gases equally over the compartments. The strips may be straight as in Fig. 1, corrugated as in Fig. 2, or spiral. The partitions F separating the chambers may be flat, or corrugated as shown in Fig. 8.

FIG. 1.

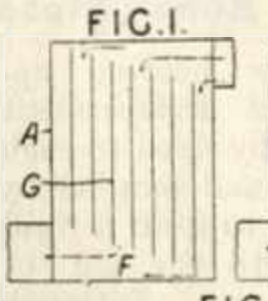


FIG. 2.

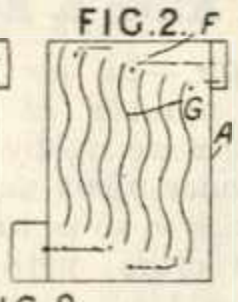
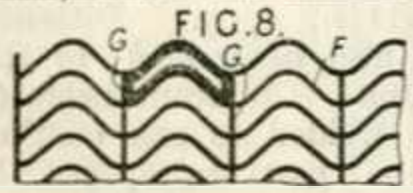


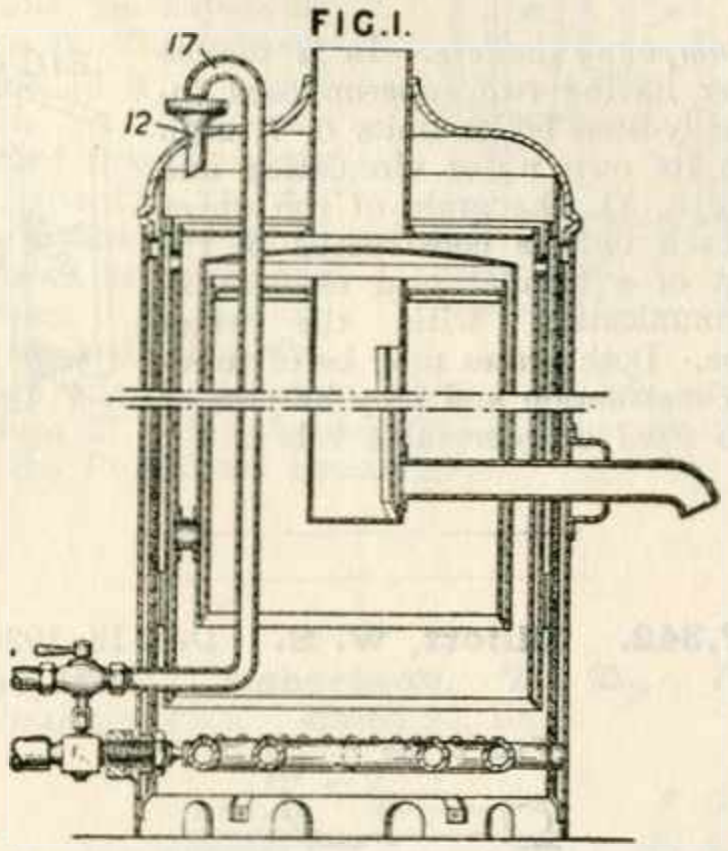
FIG. 8.



246,769. Andrews, W. F., Tarper, A. H., and **Hellyer, R. H.** Oct. 22, 1924.

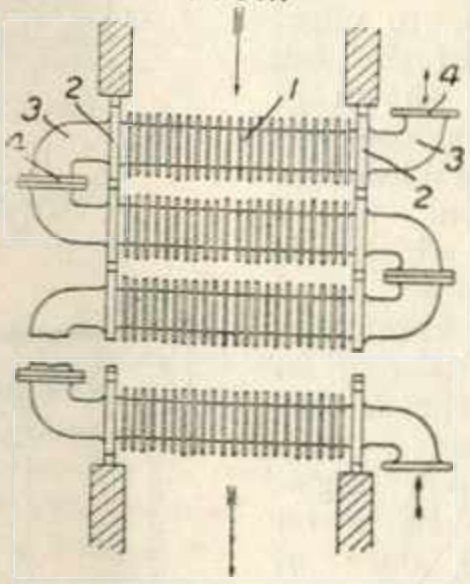
Internally-fired boilers; geysers. — The feed-tube 17 for supplying water, which may lead from the usual interlocking gas and water taps, extends through a heating space within the geyser and delivers into a funnel 12 in the upper part of the casing, the arrangement providing a pre-heater for the water and also a sight feed. Specification 246,547 is referred to.

FIG. 1.



247,101. Babcock & Wilcox, Ltd., (*Deutsche Babcock & Wilcox Dampfkessel-werke-Akt.-Ges.*). Aug. 29, 1925.

FIG. 1.



Feedwater, heating.—An economizer is constructed of ribbed tubes 1 having a bend 3 at each end with flanges 4 so that two adjacent tubes can be connected directly with one another. Intermediate flanges 2, either alone or in conjunction with frame-plates, may form the side closing walls of the economizer. Specification 21017/99 is referred to.

247,104. Winterflood, B. W., and **McDowell, O.** Sept. 9, 1925.

FIG. 4.

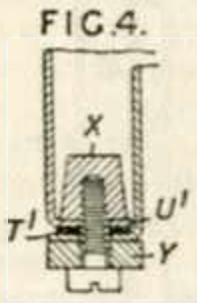


FIG. 5.

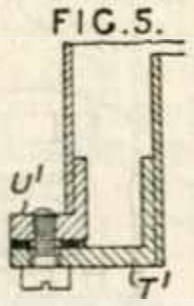
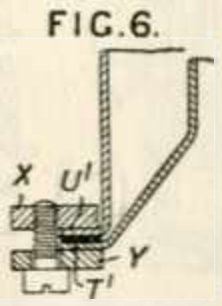


FIG. 6.



Internally-fired boilers.—The meeting edges of each pair of annular walls forming an inner water chamber or chambers in a boiler are provided with flanges, integral or affixed which are bolted together with or without packing, to facilitate the dismantling of the inner chambers for cleaning. In the examples, Figs. 4 and 6 show flanges U^1, T^1 clamped between rings X, Y, and Fig. 5 shows affixed flanges U^1, T^1 directly bolted together.

247,253. Allen & Sons (Tipton), Ltd., and **Weddell, A.** Oct. 15, 1924.

Heating air.—In air heating apparatus, a number of independent heating units *x* are rigidly fixed to each other a distance apart and parallel by direct weldings *m* so as to form a rigid grid-like structure with the aid of welded-on parts *n*, *o*, *q*. Distance pieces *l* may also be welded to the sides of the units. Adjacent nests of units may be welded to one another in situ at the parts *n*, *o*, *q*. Specification 226,315, [*Class* 64 (iii), Surface apparatus &c.], is referred to.

FIG.1.

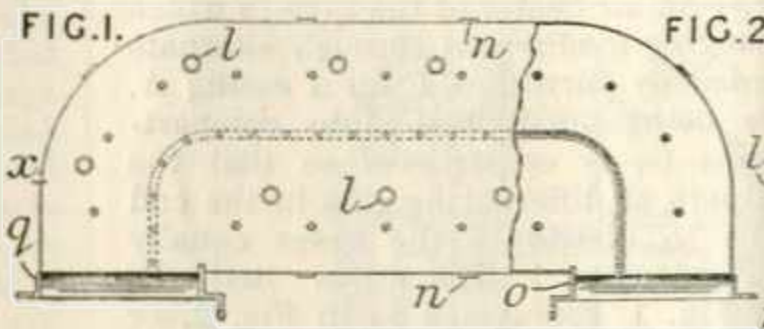
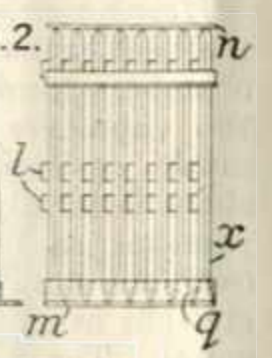


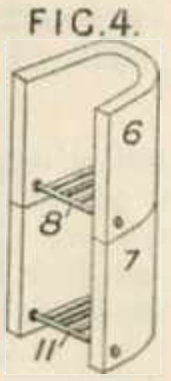
FIG.2.



247,320. Stevenson, A. Nov. 27, 1924.

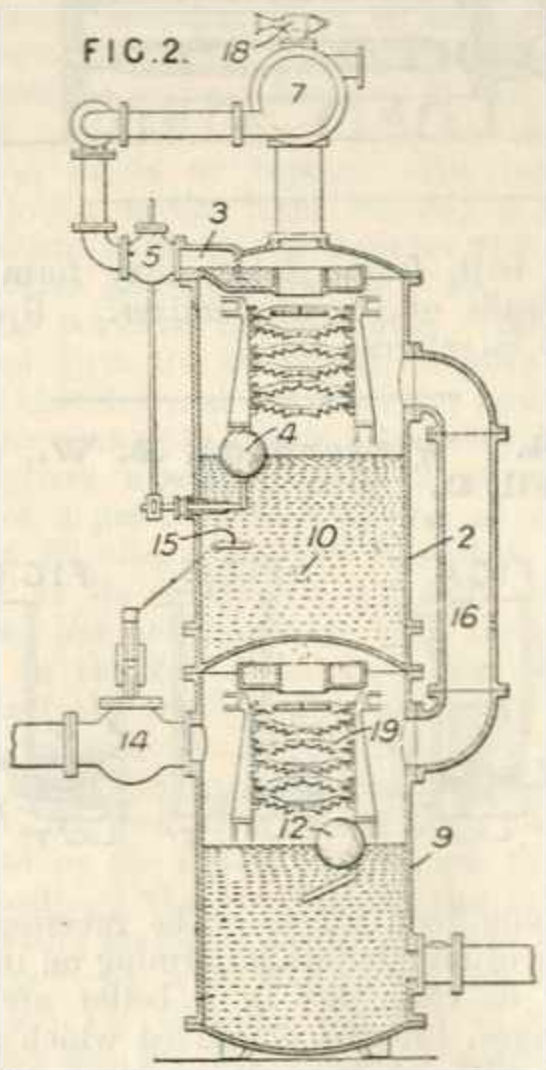
Compound boilers.—In a double boiler having two superimposed internally-fired boiler units 6, 7, each with its own water circulation and grate 8, 11, the grate of the upper or each unit is constructed in the form of a tubular grid element in communicating with the water space. Both grates may be of tubular construction and may be cast or with fixed or removable tubes.

FIG.4.



247,342. Elliott, W. S. Dec. 18, 1924.

FIG.2.

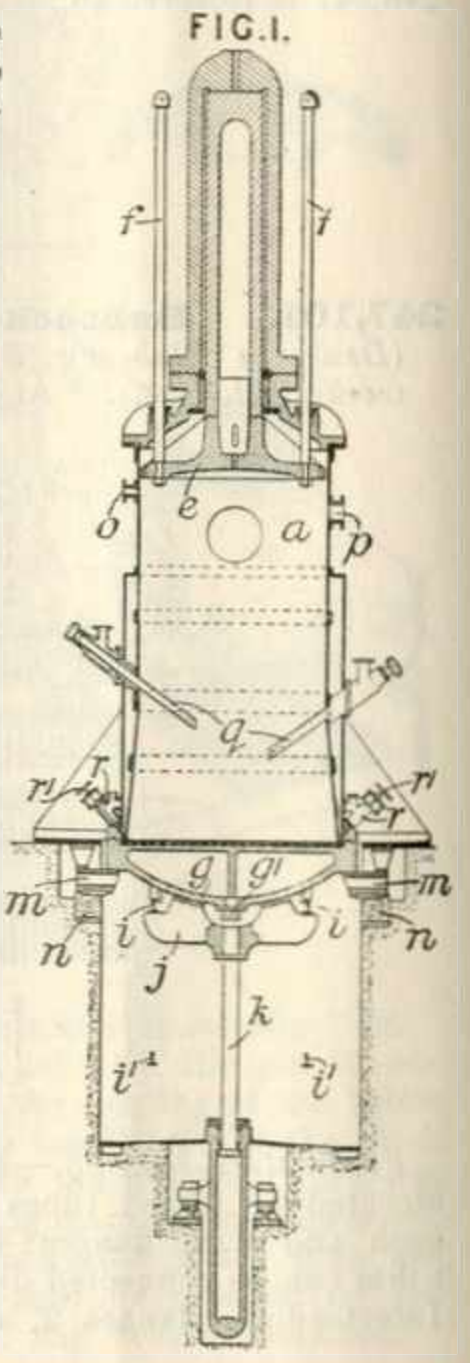


Feedwater, heating. — Feedwater is passed through two feed heaters in series, in contact with steam in counter current, the steam passing through the first heater without much condensation, and the water being de-aerated therein, while the steam is mainly condensed in the second heater, in which the main heating of the water takes place. Water is supplied through the passage 3 to the heater 2, the quantity being automatically regulated by a valve 5 controlled by a float 4. The water passes over a distributor 19 in contact with steam, and then passes through a pipe 10 to the heater 9. A valve in the pipe 10 is controlled by a float 12. Steam is supplied through a valve 14 controlled by a thermostat 15 and passes from the heater 9 through a pipe 16 to the heater 2. A condenser 7 is provided to condense any exhaust steam, and an ejector 18 to induce a flow of steam through the apparatus.

247,437. Phillips, E. B., and **West, W.** May 13, 1925.

Digesters. — In the preparation of fish meal, fish offal is cooked by steam in a closed vessel and steam is admitted at the base of the cooking space and directed beneath the charge to effect agitation of the fish offal. As shown in Fig. 1, the cooking-vessel *a* is closed at the bottom by a door *g* which is raised into and lowered from its closed position by an hydraulic ram *k* having a head *j* with rails *i* which register with rails i^1 on which the door *g*, and the cooked, compressed cake of fish offal resting thereon, is wheeled away to a drying-chamber. Locking-bolts *m* having racks which are

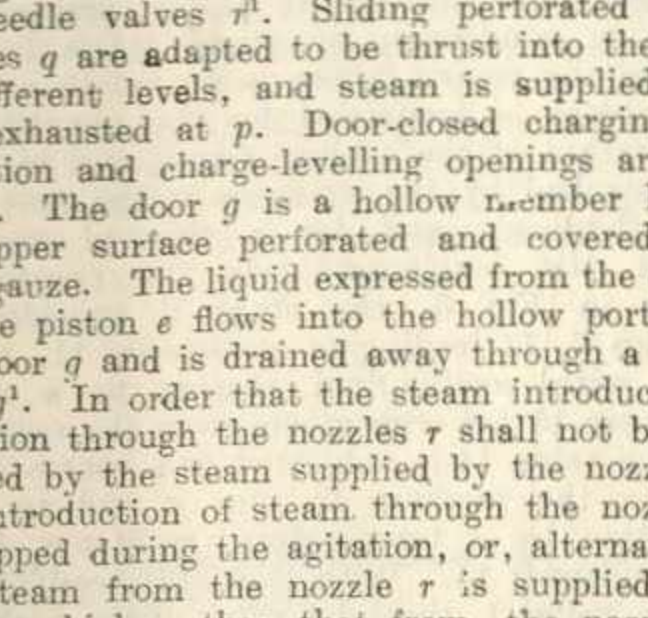
FIG.1.



engaged by pinions n, support the door g when it is closed. The offal is compressed, after the cooking is complete, by an hydraulically operated piston e having indicator rods f ending in eyes to which the counterweight cables are attached. The steam for agitating is supplied through downwardly oblique nozzles r controlled by needle valves r^1. Sliding perforated steam nozzles q are adapted to be thrust into the mass at different levels, and steam is supplied at o and exhausted at p. Door-closed charging, observation and charge-levelling openings are provided. The door g is a hollow member having its upper surface perforated and covered with wire gauze. The liquid expressed from the charge by the piston e flows into the hollow portion of the door g and is drained away through a steam trap g^1. In order that the steam introduced for agitation through the nozzles r shall not be suppressed by the steam supplied by the nozzles q, the introduction of steam through the nozzles r is stopped during the agitation, or, alternatively, the steam from the nozzle r is supplied at a pressure higher than that from the nozzles q. Specification 103,493, [*Class* 28 (ii), Kitchen and like appliances &c.], is referred to.

247,605. Feld, F. W. C. A. Feb. 14, 1925, [*Convention date*].

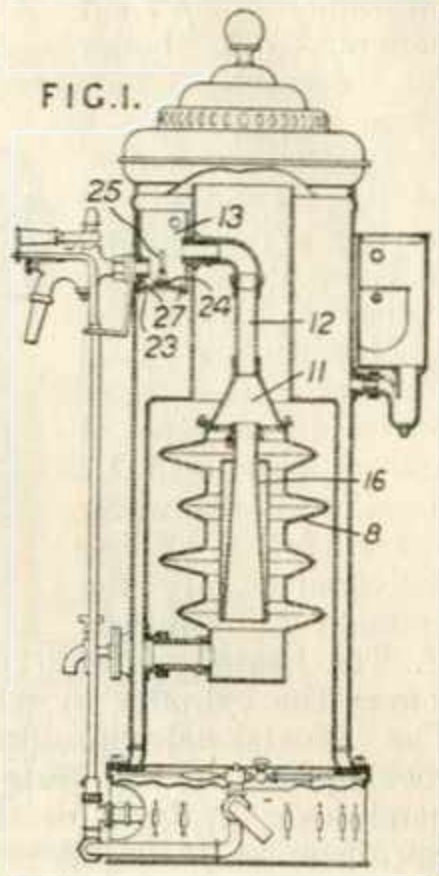
FIG. 1.



Water-tube boilers.—For generating steam or hot water a boiler comprises a number of groups of heating-bodies 8 each constructed from two concentric tubes 17, 18 closed at top and bottom by annular covers 21 and connected laterally at top and bottom by tubes to adjacent units 8. The groups thus formed are united by side connections 27, 28 to adjacent groups and the whole is supplied with water from a pre-heater 25 through a pipe 26 to the lower connections. The upper connections 28 communicate with a steam reservoir 30 by a pipe 29. The tubes 17, 18 of each unit may have removable linings, for example of copper, in contact with the water.

247,749. Jackson Boilers, Ltd., and Davis, A. F. March 4, 1925.

FIG. 1.



Internally-fired boilers; water delivery. — In a self-feeding water heater, a displacer 16 is wholly immersed in the water contained in a heating chamber 8 immediately beneath an expansion pipe 12, a conical member 11 forming the sole connection between the chamber 8 and the expansion pipe 12. The delivery tank 13 is provided with a flap-controlled drain-aperture 23, the flap 24 having a vane 25 adapted to rock it under the stream of boiling water and thus dislodge any incrustation which will fall into the sumps 27. Specification 22332/10 is referred to in the Provisional Specification.

247,763. Robertson, T. E., (*Power Specialty Co.*). March 24, 1925.

FIG. 2.

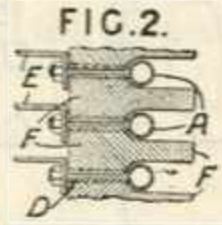
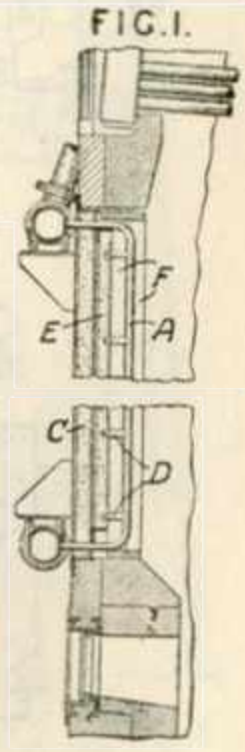


FIG. 1.

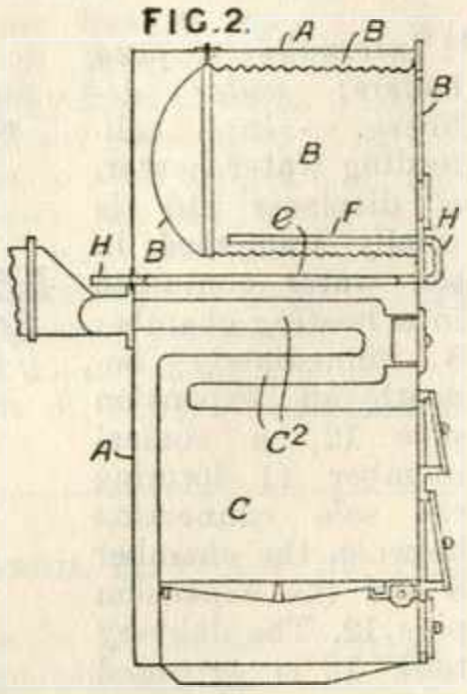


Waer-tube boilers.—A fluid-heating element comprises a tube adapted for exposure on one side to high temperatures and supporting-devices extending away from the opposite side of the tube and rigidly connected to it at intervals along its length, the tube being bare between the supports. As shown in Fig. 1 in combination with a furnace wall C, the tube A has supports D welded to it adapted to be secured as by nuts to angle bars E the holes in which may be slot-like to accommodate expansion. Refractory blocks F, arranged between the tubes A and the bars E, may extend beyond the tubes as shown, or may permit the whole of the tube to be exposed to the heat.

247,765. Wilson, H. H. March 26, 1925.

Heating water; internally-fired boilers. — A boiler for domestic purposes comprises a corrugated water-heating cylinder B having a domed end and enclosed in a boiler A heated by a furnace *c* and flues c^2. The water enters by a pipe H and is preheated by a coil *e* in the water space before being delivered to the cylinder B by a pipe F. The heated water leaves the cylinder by a pipe at its upper part. The Provisional Specification states also that rocking bars in the grate may be operated by a hand lever in front of the boiler and refers to Specification 16405/99.

FIG. 2.



247,924. Siemens - Schuckertwerke Ges. Feb. 18, 1925, [*Convention date*].

FIG. 2.

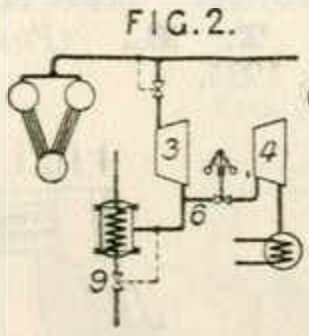


FIG. 3.

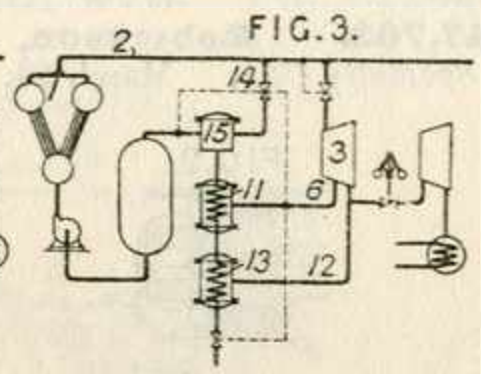
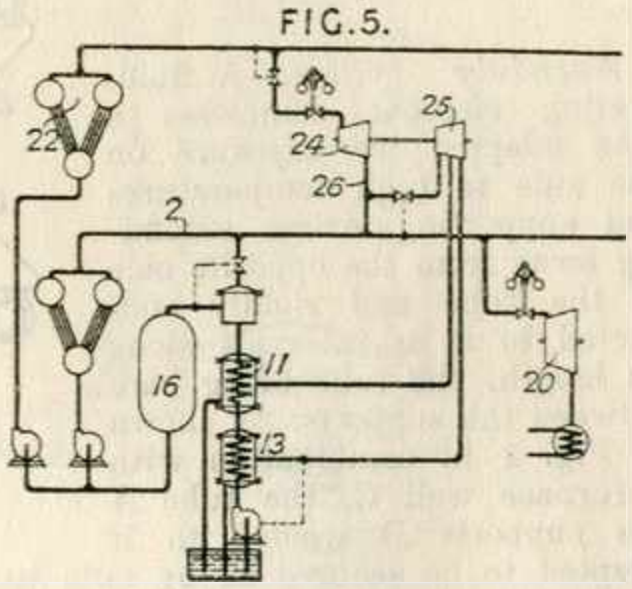


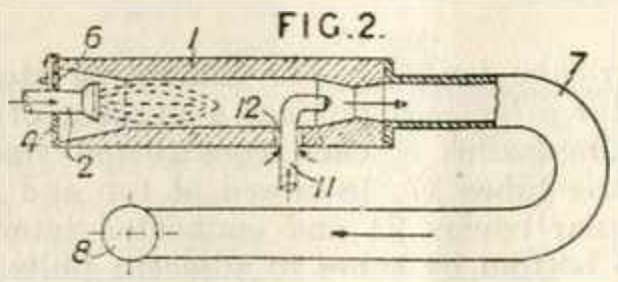
FIG. 5.



Feedwater, heating.—In a multistage engine plant wherein steam is withdrawn and passed through a condenser, e.g. for heating feedwater, the supply of cooling-water is regulated in accordance with the pressure at the withdrawal place. In a plant with high and low pressure stages 3, 4 connected by a governor-controlled passage and having intermediate steam withdrawal through a pipe 6, a condenser is arranged behind the place of withdrawal the cooling-liquid of which is regulated by a valve 9 controlled by the pressure in pipe 6. If the steam is withdrawn from a number of stages, the steam from each stage is condensed in a separate condenser, the cooling-liquid passing through these in succession. The cooling-liquid, heated in stages, passes to a reservoir, and it is additionally heated, preferably in a mixing condenser, by steam taken from in front of the engine before being fed to a boiler. This steam is controlled by the quantity and temperature of the cooling water, and may also be controlled by the pressure at the first place of withdrawal, and by a thermal regulator behind the condenser. In the construction shown in Fig. 3, the stage 3 provides two tappings 6, 12 leading to condensers 11, 13 provided with cooling-fluid passing to a mixing condenser 15 fed with steam from the main pipe 2. The valve 14 is subjected to a coarse regulation by the pressure in pipe 6 and to a fine regulation by a temperature regulator behind the condenser 15. With constant steam generation in boiler 1, the inlet valve of the turbine is controlled by the pressure in the live steam pipe in accordance with the steam withdrawn for the mixing condenser. To avoid disturbing the low-pressure turbine, in a modification it is supplied directly from the main 2 and controlled by the load. In the construction shown in Fig. 5, the auxiliary turbine comprises high and low pressure portions 24, 25 supplied from a high-pressure boiler 22. The withdrawal pipe 26 is connected to the steam pipe 2 and through a regulator controlled by the pressure in pipe 2 is connected to the portion 25 which exhausts to condensers 11, 13. In a modification of this construction, a portion of the steam from part 24 is condensed in a third condenser arranged above condensers 11, 13 by the feedwater which has its temperature raised to nearly the temperature in pipe 26. The excess steam of the system is condensed in a further condenser connected to the reservoir 16, the condensing feedwater being regulated by the pressure in front of the main turbine 20.

248,146. Pharos Feuerstätten Ges., and **Schmuck, H.** Jan. 22, 1925.

FIG. 2.

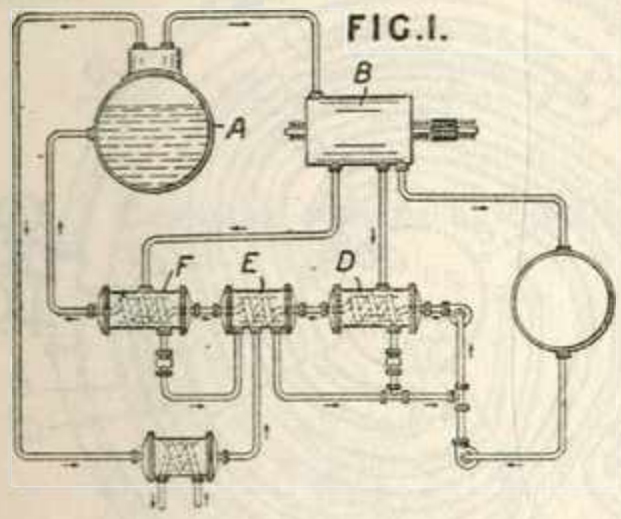


Submersible liquid-heaters.—In a gas-heated heating element for heating water and other liquids, a mixture of pressure gas and air or pressure air and gas is burnt by one or more burners 2 projecting into a refractory combustion chamber 1 the inlet end of which is completely closed to the external air by a plate 4

having a small lighting opening 6. The combustion of the gas mixture takes place practically entirely within the combustion chamber and the heating gases obtained pass directly into a straight or bent metallic heat-transferring tubular body 7 connected to a waste-gas flue 8. In order to regulate the temperature and pressure of the heating gases, compressed air may be introduced by a conduit 11 into the exit end of the combustion chamber, with or without the simultaneous aspiration of air at ordinary pressure through an opening 12 surrounding the conduit 11. The waste gases may be used to preheat the air supplied to the burners or the aspirated air, or they themselves may be aspirated.

248,264. Krupp Akt.-Ges., F. April 4, 1925, [*Convention date*].

FIG.1.

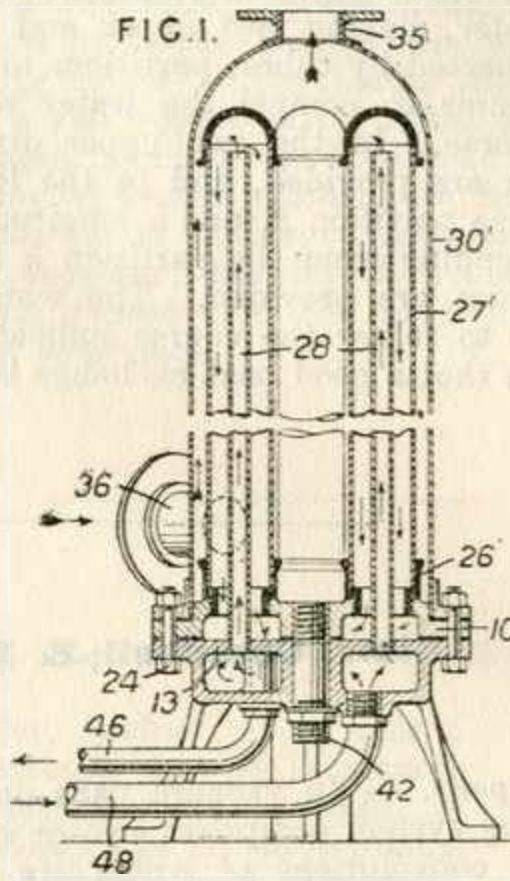


Feedwater, heating. — In a multi-stage feed-heater particularly for condensing locomotives, between two stages D, F heated by steam a stage E is interposed in which the heating medium is condensate from a later steam-heated stage F. In the example shown a boiler A supplies a turbine B from which steam is tapped for the heaters D, F. In a modification there is only one tapping but the steam to the heater D passes first through an auxiliary turbine.

248,624. Morton & Co., Ltd., R., and Robinson, P. July 16, 1925.

Heating liquids.—A tubular heater for liquids comprises a horizontal header 10 divided into two compartments by a horizontal partition 13 formed on the lower portion, which is separate from the upper portion. The upper portion is formed with openings which receive connecting members 26 carrying heating tubes 27 formed of copper and closed at the top. Each tube 27 is provided with an inner tube 28 secured to the partition 13 and open at the top. The tubes are enclosed by an outer casing 30 of thin metal, e.g., copper, which is fitted with a flange at the bottom and secured to both parts of the header by bolts 24. Liquid to be heated is admitted at 36 and discharged at 35. Steam &c. is admitted at 48 and

FIG.1.



discharged at 46, passing through the heating tubes as shown by the arrows. A drain tube 42 passes downward through the header.

248,831. Douglas, A. M. Dec. 10, 1924.

FIG.1.

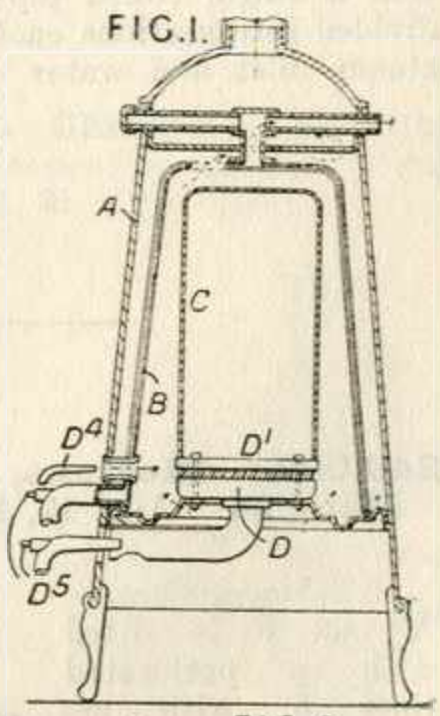
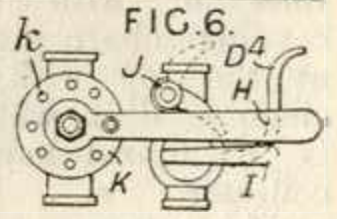


FIG.6.

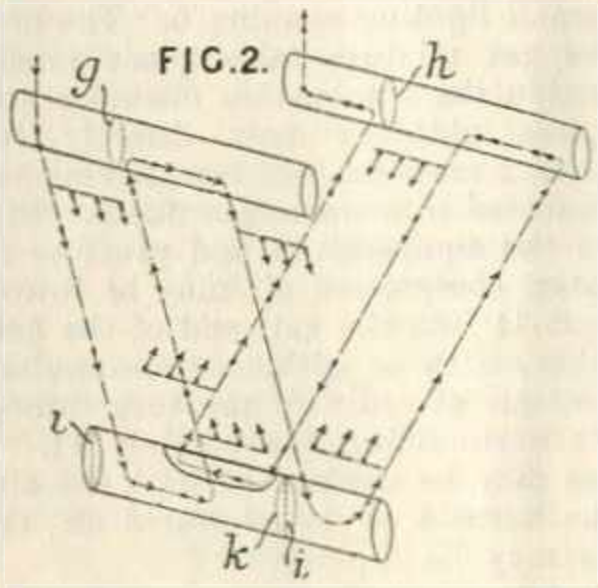


Internally-fired boilers.—A bell-shaped water chamber B is mounted within a preferably white enamelled casing A and a displacer C in the form of a drum is secured to a plate D^1 forming the top of the burner D. The water and gas valves have inter-engaging handles H, I. The handle H must be turned before the handle I can be moved and before the gas valve can be opened fully a pivoted stop J must be swung on one side since normally the stop prevents the handle I of the gas valve from being moved more than is sufficient to admit gas to the pilot burner D^4. If a screw down water valve is used holes *k* on a plate K enable the position of the handle H to be suitably adjusted. The gas and water pipes may be provided with screw control-valves D^5 to determine the amount passing when the inter-connected valves are fully open.

248,853. Stirling Boiler Co., Ltd., and **Mackay, H. J. S.** Dec. 15, 1924.

Feedwater, heating.—In an economizer or feed-water heater, having two upper and one lower drum connected by tubes, partitions are provided in the drums to compel the water to follow a zigzag course. In the two upper drums partitions *g*, *h* are provided, and in the lower drum a transverse partition *k*, and a longitudinal partition *i* extending from the partition *k* to the end of the drum are provided. The water is thus compelled to follow the course indicated by the arrows, so that a good heat exchange is obtained.

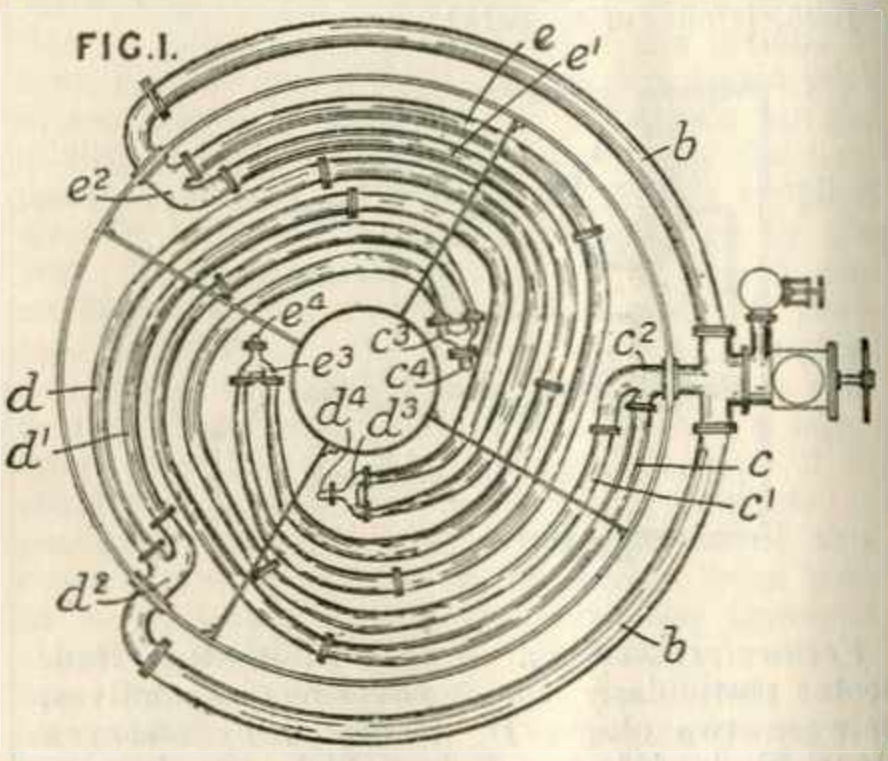
FIG. 2.



248,897. Blair, Campbell, & McLean, Ltd., and **Blair, A.** Feb. 9, 1925.

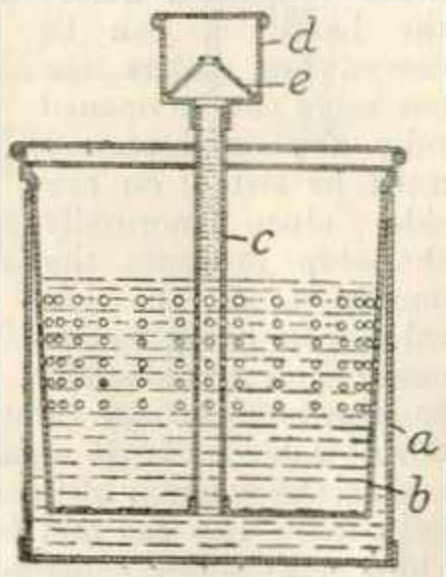
Boiling-pans. — In vacuum pans and the like the heating system comprises two or more coiled pipes the convolutions of which are all in the same plane each pipe being independently connected to the steam supply pipe and provided with a discharge outlet for the steam condensed. The steam pipe *b* is connected by coupling pipes c^2, d^2, e^2 to three pairs of pipes *c*, c^1, *d*, d^1 and *e*, e^1 the inner ends of which are joined by couplings c^3, d^3, e^3 connected by discharge pipes c^4, d^4, e^4 to a common discharge pipe by which the condensed steam is withdrawn. In a modification a single coiled pipe is employed which is divided into sections each having an independent steam inlet and water outlet.

FIG. 1.

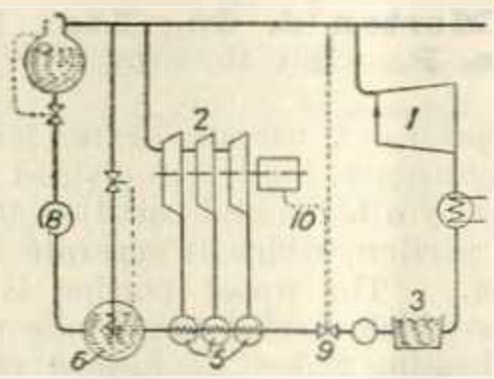


249,009. Mertens, R., Horn, E., and **Nöle, P.** Aug. 17, 1925.

Washing-boilers.—A pan *a* is fitted with a perforated liner *b*, with ascending tube *c* fitted at the top with a chamber *d* in which is a funnel-shaped collector *e*. In action steam and boiling lye rise in the tube *c* and deposit dirt &c. in the chamber *d*, the steam being condensed and the lye falling back through the tube *c*.



249,159. International General Electric Co., Inc., (Assignees of *Allgemeine Elektricitäts Ges.*). March 14, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].



Feedwater, heating.—In a steam power-plant, condensate from a main turbine 1 is stored in a vessel 2 from which it is fed to preheaters 5, heated by steam tapped from the stages of an

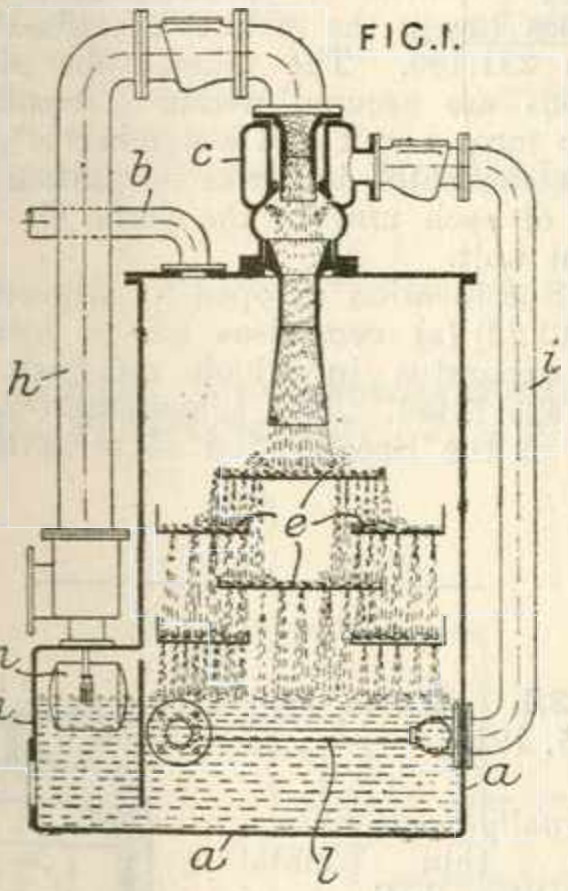
auxiliary turbine 2, and thence to a storage vessel 6 where additional heat may be supplied by live steam. The feed may be further heated in an economizer before passing through a pump 8 to the boiler. The valve 9 controls the supply of feed in accordance with the boiler pressure and may also be controlled by a device 10 influenced by an electric generator driven by the turbine 2, in accordance with the output of the generator.

249,223. Hick, G. M., and **Hick, N. G.** Dec. 22, 1924.

Digesters.—A closed dental boiler, for use in hardening dentures formed of a phenol-aldehyde condensation product such as Bakelite by heating under pressure in porous moulds, is charged with alcohol or methylated spirit in place of water to obtain a higher pressure at a given temperature.

249,283. Caird & Rayner, and **Tomlinson, W.** Feb. 10, 1925.

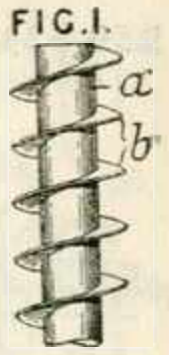
FIG.1.



Feedwater, heating.—In apparatus for removing gases, e.g. air, from liquids, of the kind in which the heated liquid falls upon a series of perforated baffle plates or dishes *e* arranged in a closed vessel *a* in which reduced pressure is maintained by means of an air pump or the like connected to the vessel by a tube *b*, the vessel is provided with a mixing nozzle *c* in valved communication with the supply of liquid to be treated and with a supply of steam through pipes, *h*, *i*. The nozzle discharges the mixture of steam and liquid above the plates *e*, the liberated gases being drawn off through the pipe *b*. The treated liquid collecting in the bottom of the vessel is maintained at a temperature sufficient to prevent re-absorption of the gases by means of tubes *l*, which are heated either by the steam passing to the nozzle or by steam from another source. The admission of liquid to the nozzle may be controlled by a valve operated by a float *n* arranged in the treated liquid in the bottom of the vessel *a*. A series of vessels, which may be operated at the same or at different pressures, may be connected together, the liquid treated in one vessel being passed into the succeeding vessel for further treatment.

249,432. Leissner, O. Oct. 28, 1925.

FIG.1.



Feedwater, heating. — A tube *a* for economizers &c. has a smooth internal surface and inclined or spiral disc-like ribs *b*, surrounding, and cast integrally with, the tube. The ribs may form single spirals as shown or double or multiple spirals. Adjacent tubes may have the spirals of opposite hand or the same hand but with the ribs intermeshing.

249,479. Soc. E. Chaboche et Cie. March 19, 1925, [*Convention date*]. *Void* [*Published under Sect. 91 of the Acts*].

FIG.1.

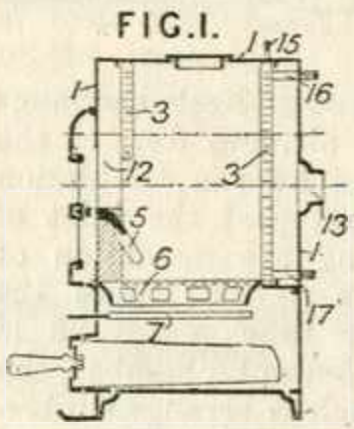


FIG.8.

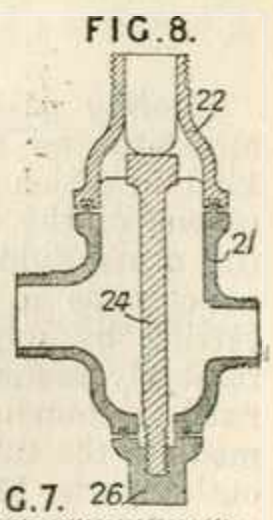
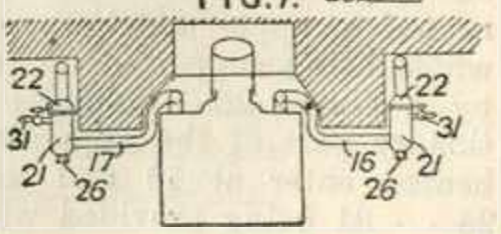


FIG.7.



Annular boilers.—A boiler for placing in front of an ordinary fireplace for heating circulation-water and for warming the room comprises a waterspace 3 in a housing 1, fuel in the central fuel space resting upon a comb-like grid 5, a

perforated ring 6 and a bottom shaking-grate 7. Air for combustion passes in through the grid 5 and products of combustion emerge at the opening 12 and traverse the annular space between the boiler and housing to the exit 13. Flow and return pipes 16, 17, connect to the circulation system, and, where the flow pipe 16 is, for convenience, bent down to floor level before passing up to the expansion tank, an upwardly directed pipe is fitted between the connection 15 and the higher part of the pipe 16 to accelerate the flow. To allow of ready removal of the boiler when desired, the pipes 16 and 17 join the circulating pipes by joints shown in Figs. 7, 8, comprising casings 21 detachably held to the unions 22 by cap-nuts 26 on bolts 24. Drain cocks 31 are provided.

249,534. Chavanne, L. March 19, 1924, [*Convention date*].

FIG.7.

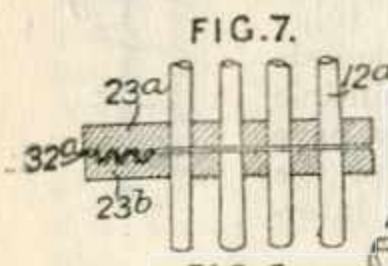


FIG.5.

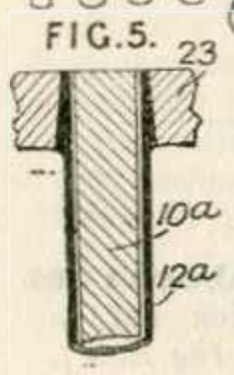
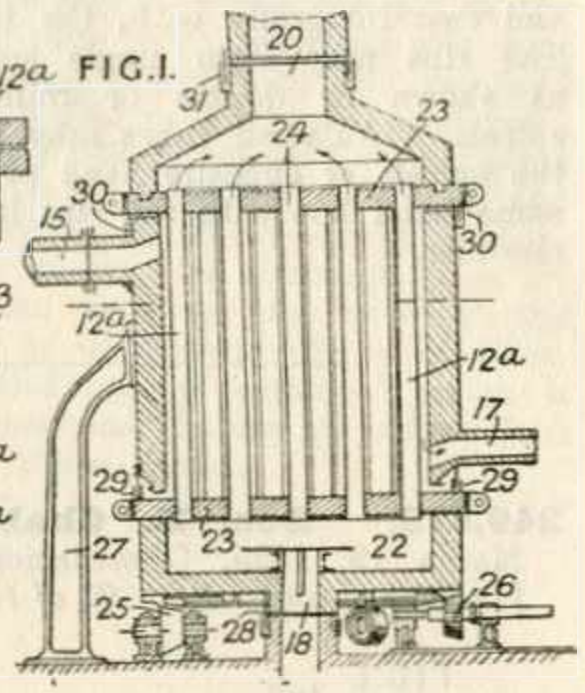


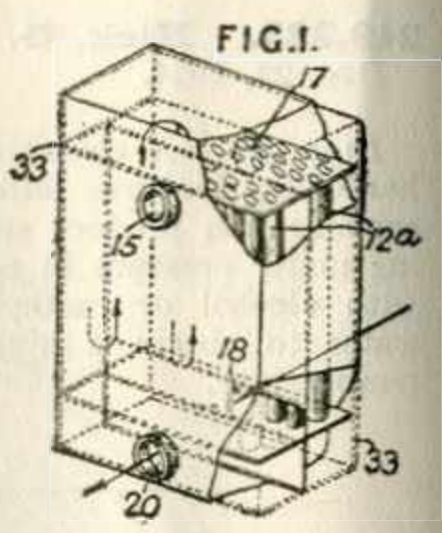
FIG.1.



Heating gases.—In continuous heat exchange apparatus for fluids such as air, gas &c., of the kind in which a nest of flues for the circulation of one of the fluids is rotated past the inlet of the other fluid, thus avoiding the formation of a hot zone at the inlet, the nest of tubes 12^a carried by upper and lower tube plates 23 is rotatably mounted in a fluid-swept chamber the fixed surrounding wall of which is arranged intermediate the tube plates and carries the inlet and outlet ports 15, 17. The tubes plates are connected to upper and lower chambers 24, 22, the whole being supported on rollers 25 and rotated by a pinion 26. Columns 27 support the stationary part of the apparatus. The gases to be heated enter at 18 and leave at 20, packings 28 - - 31 being provided where the rotary parts connect with the fixed parts. Refractory radiating bodies 10^a may be arranged within and around the tubes 12^a, which may be soldered to the plates 23 as shown in Fig. 5. For heating air to a very high temperature nests of tubes 12^a are arranged in series, adjacent tube plates 23^a, 32^b being jointed together by asbestos packing 32^a, Fig. 7. The material of which such nests of tubes and their internal and external radiating bodies are formed may be progressively of a less refractory nature as they become further removed from the hot gas inlet or burner 15.

249,535. Chavanne, L. March 19, 1924, [*Convention date*].

FIG.1.

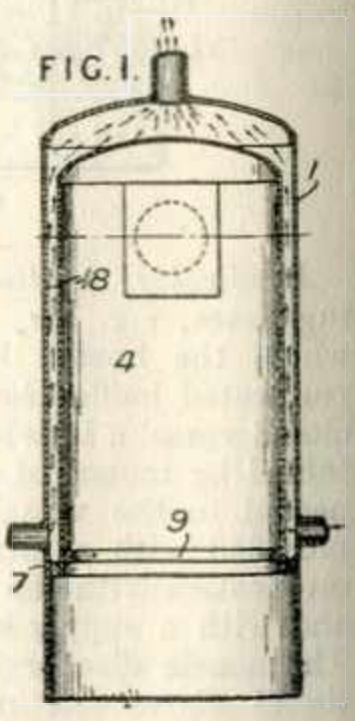


Heating gases. — In heat exchangers comprising a chamber 33 divided into a middle compartment and two end compartments by tube plates carrying tubes 12^a, the middle compartment having a baffle, an inlet 15, and an outlet 17 for hot gases and one end compartment being divided into two parts by a partition so that the gas to be heated, supplied at 18, circulates through the tubes 12^a and passes out at 20, heat-radiating bodies are arranged within or without or both within and without the tubes 12^a in the manner described in Specification 231,186. The tubes, tube plates, and partitions are secured within a box-like metal shell to form a unit and a number of such units may be connected in series by joining the ports 15, 20 of each unit to the ports 17, 18 of the adjacent unit.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also a form of the above apparatus in which no heat radiating bodies are fitted. This subject-matter does not appear in the Specification as accepted.

249,732. Gaul, R. Aug. 5, 1925.

FIG.1.



Internally-fired boilers. —Two thin metal thimble-like shells 1, 4 are united at the lower end by a welded joint or ring 7 to form a thin water space 18 enclosing a combustion chamber. A further ring 9 may be welded in to support the grate and the outer shell 1 may extend below the ring to enclose the ash-pit.

249,817. Akt.-Ges. Brown, Boveri, et Cie. March 24, 1925, [*Convention date*]. *Drawings to Specification.*

Feedwater, heating. — In power stations in which the feedwater is pre-heated by steam from an auxiliary turbine this turbine drives two generators, one supplying current for driving auxiliary machinery whilst the other is connected to the main supply. Any demand for pre-heating steam in excess of that obtained through the requirements of the auxiliary machinery is met by loading the second machine, and when the said demand falls below that sufficient to drive the auxiliaries the second runs as a motor to supply the deficient power. Preferably this machine generates alternating current and that supplying the auxiliaries direct current. The steam supplied by the auxiliary turbine may be governed by keeping its back pressure constant or when run as a tapped back-pressure turbine by keeping constant the pressure of one tapping point say the first from the high-pressure end. Alternatively it may be governed by the final temperature of the feed water, e.g. by a thermostat. When, as upon a breakdown of the main generating plant, the steam from the auxiliary turbine is in excess of that required for pre-heating, a valve may be opened to allow steam to flow into a condenser.

250,055. Donald, W. June 4, 1925.

Block-form boilers. — A liquid heater comprises a horizontal cylindrical vessel *a*, divided by plates *l*, *m* into compartments through which the liquid flows in series, and traversed by fire-tubes *b* passing diametrically or transversely and shown as arranged in groups alternate of which have the tubes at right-angles. A series of burners *c* is arranged below the vessel *a* in a casing *d*. A feed-heating or fuel-heating tank *e* is arranged in the upper part of the casing.

FIG. 1.

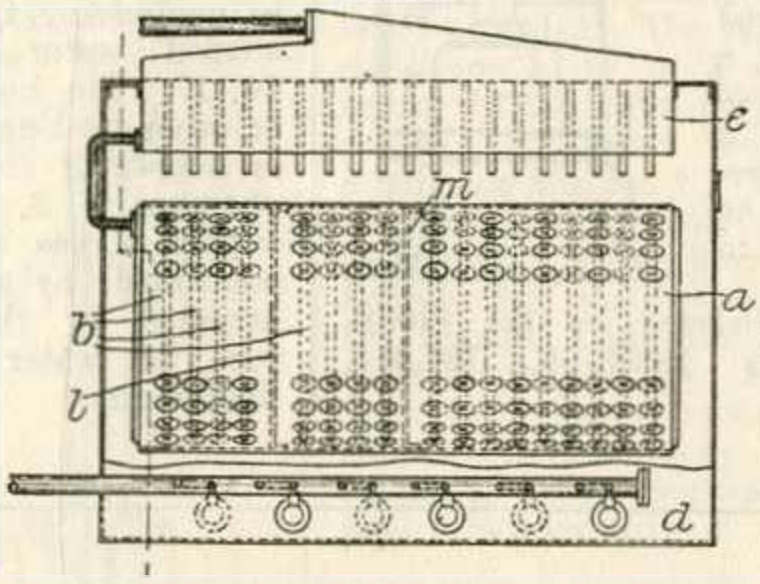
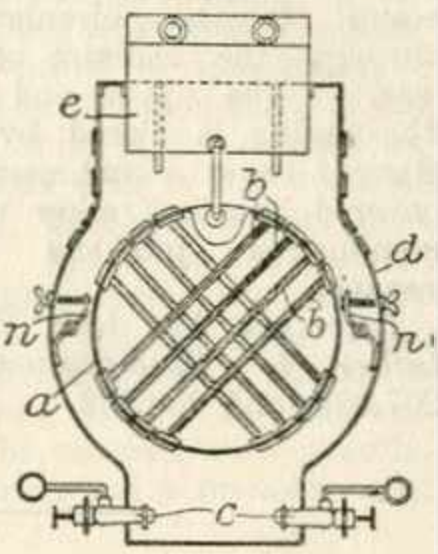
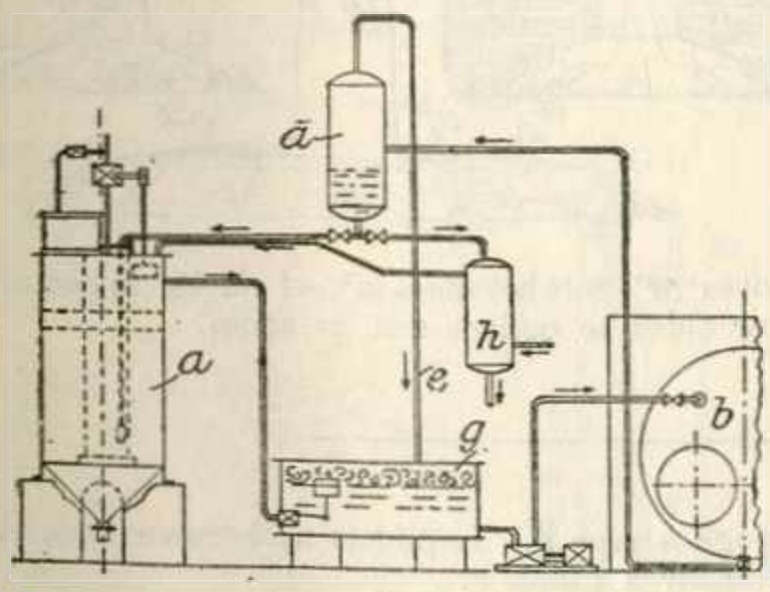


FIG. 2.



Movable baffles *n* may divide the casing horizontally.

250,061. Neckar Waterreiniger Maatschappij, and **Heringa, J.** June 16, 1925.



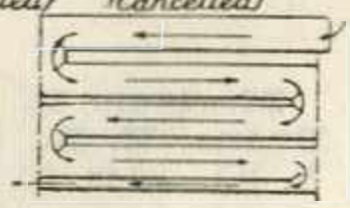
Feedwater, heating. — Water and impurities blown down from a boiler *b*, on their way to a purifier *a* from which the boiler is supplied with water, are led through a pressure relieving chamber *d*. Steam is taken from the chamber *d* through a pipe *e* to the feed-supply tank *g*. Fresh feed and purifying substances are supplied to the purifier. Sludge and hot water may be led off from the chamber *d* through a pre-heater *h* for the fresh feed.

250,169. Compagnie Nationale des Radiateurs. April 4, 1925, [*Convention date*].

FIG. 2.

FIG. 6. (Cancelled)

FIG. 7. (Cancelled)



Heating water. — A water heater comprises a reservoir and a heating element formed by a hollow body adapted to be traversed by a hot fluid, the hollow element being formed of two shells

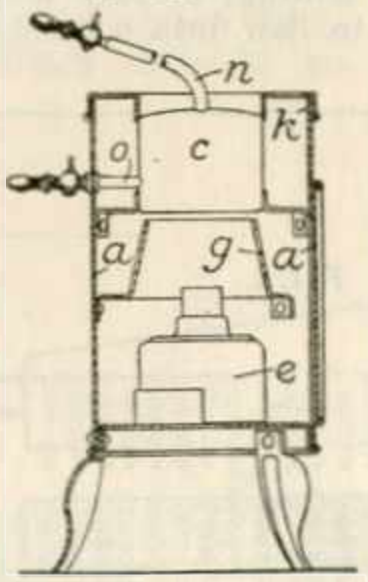
connected at their edges the plates being corrugated from end to end as shown in section in Fig. 2 and discs or plugs being soldered or welded to the plates to close the ends of the ducts formed by the opposed corrugations. In a modification the plates are annular in form.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also variations in the form of the flat elements two of which are shown in Figs. 6 (*cancelled*) and 7 (*cancelled*). Others mentioned comprise tubular grid-like arrangements. This subject-matter does not appear in the Specification as accepted.

250,361. Cook, A. J. Feb. 11, 1925.

Portable water heaters.—In a portable heater for use in garages, a lamp *e* and boiler *c* are arranged within a casing *a* together with a conical sleeve *g* to concentrate the heat, and flow and return pipes *n*, *o* are provided to enable hot water to be circulated through the radiator of a car. The upper end of the casing is closed by a flanged cover *k* and gauze-covered openings allow the combustion products to escape.

FIG. 2.

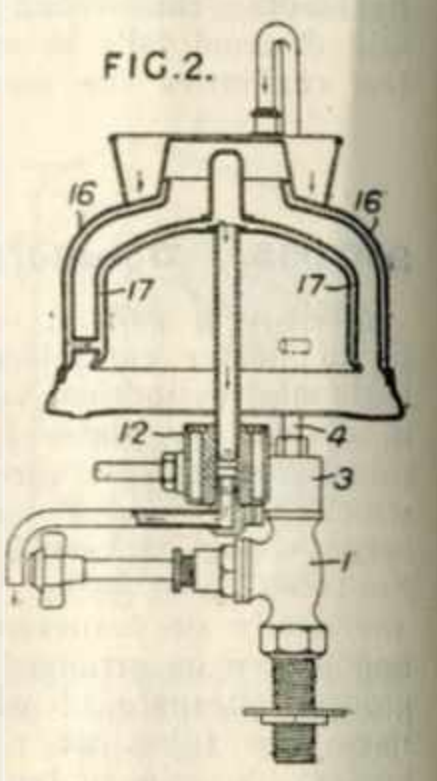


Reference has been directed by the Comptroller to Specifications 18383/08, 124,674, 207,625, and 209,922.

250,406. Tilley, F. C. May 6, 1925.

Geysers; internally-fired boilers.—A water-cock 1 acts as a pedestal to support a chamber 3 from which leads a pipe 4 supplying water to the upper end of a heater shown as comprising two bell shaped water jackets 16, 17. The burner 12 or other heating means is supported from the chamber 3. The supply of gas may be controlled by a valve actuated by the pressure of water on a diaphragm.

FIG. 2.



250,483. Engelbrecht, A. Nov. 2, 1925.

Boiling-pans.—A circulating-device is provided with a conical pipe *b* furnished at its closed top with slots b^1 so that hot water rising in the pipe flows out of the slots in broad streams forming concentric rows at different distances from the pipe. In modifications the number of effective outlet openings b^1 can be varied by a sliding sleeve b^6, Fig. 2, or by a telescoping slotted head. Jet nozzles b^0 arranged tangentially or guide vanes *d* may be used to give the circulator a twisting movement under the influence of the water flow. The inlet openings a^1 in the base are countersunk inwardly. In further modifications the top b^2, Fig. 4, may be arranged to lift under the pressure of water against a weight b^3 or an adjustable spring. The base *a* may have grooves or protuberances a^0, a^x on its upper and lower sides to collect dirt or scum.

FIG. 1.

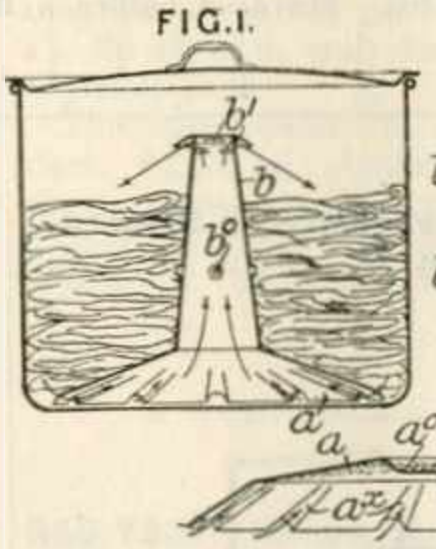
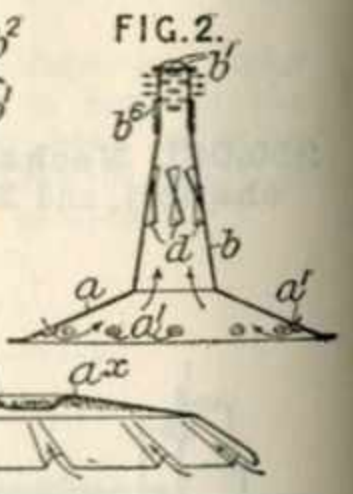


FIG. 4.

FIG. 2.



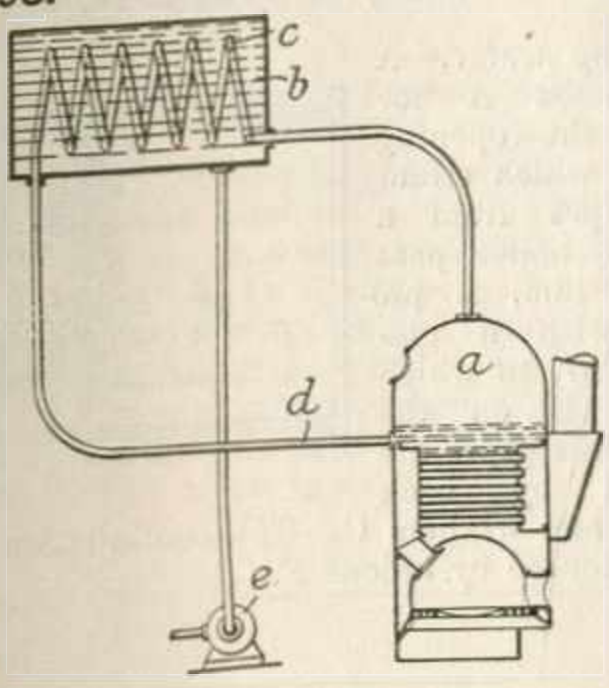
250,693. Morison, R. B., Tucker, R. E., and **Evans, H. R.,** (Representatives of *Morison, D. B.*). Jan. 23, 1925.

Heating liquids.—Water or other liquid in a heater *b* is heated by circulating steam from a fired boiler *a* through a coil *c* in the heater. Condensate is returned from the coil to the boiler through a pipe *d*. Liquid is withdrawn from the heater by a pump *e*.

Reference has been directed by the Comptroller to Specifications 8713*/88, [*Class* 123, Steam generators], 25681/13, 195,989, 210,749, and 215,764, [all in *Class* 123(ii), Steam generators].

(For Figure see next page.)

250,693.



250,762. Blair, Campbell, & McLean, Ltd., and **Webster, R.** April 25, 1925.

FIG. 1.

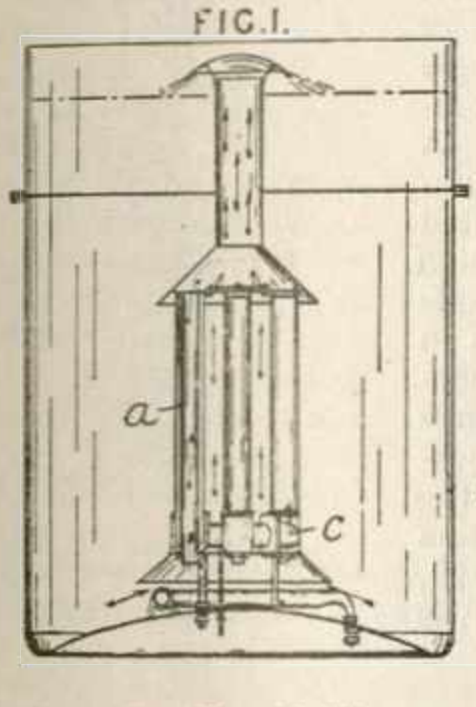
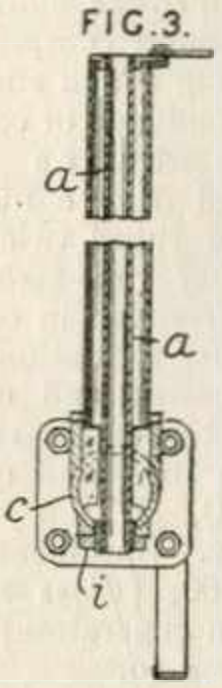


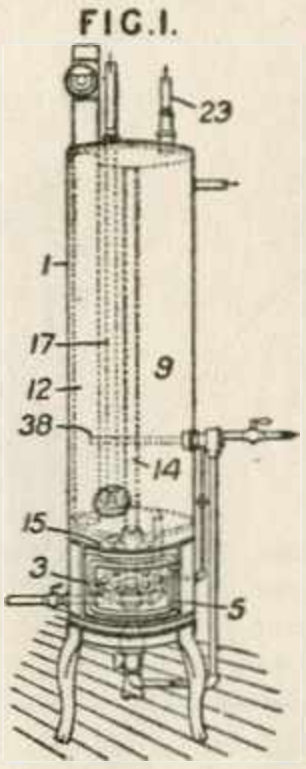
FIG. 3.



Heating liquids; boiling-pans. — A boiling-device for a copper &c. comprises a series of open-ended jacketed tubes *a* secured at their lower ends to a header *c* each by a single nut *i* screwed on the inner pipe.

250,918. Paige, A. E. April 16, 1925, [*Convention date*].

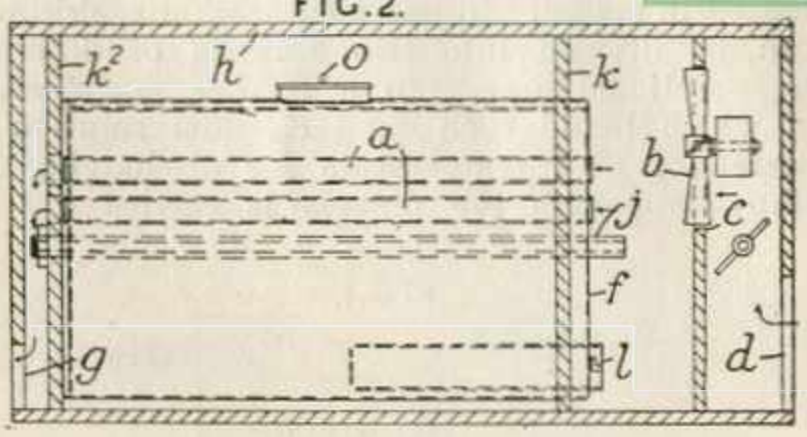
FIG. 1.



Block-form boilers. — A water heater comprises a main water-space 9 with flue 12. A spreader 15 above the burner 3, is connected with the water-space 9 by an axial opening in the bottom and has a flow pipe 14 leading to near the top of the main body of water. The gas supply is thermostatically controlled.

251,099. Wilkinson, G. Oct. 5, 1925.

FIG. 2.



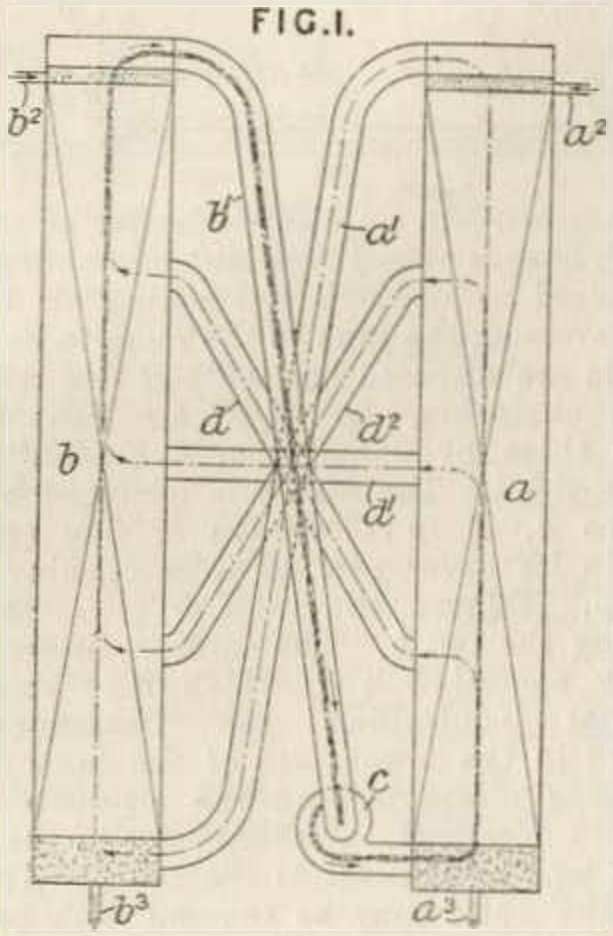
Heating air.—In an electric heater of the type in which heat is stored in a tank containing water and utilized as required by passing air through ducts traversing the tank to the room to be heated the ducts are disposed horizontally and open into vertical chambers, so that air cannot pass through them by convection, a circulating fan being provided. The tank *f* is arranged between partitions *k*, *k*² in a wooden or like casing *h* having in its lower part an inlet opening *d* and outlet *g*. Behind the inlet *d* is a partition *c* carrying the fan *b*. The tank is supported on a hollow central bolt *j*, which may contain a thermostat controlling the heating-current. Pockets *l* in the lower part of the tank contain the heating elements, and the air-ducts *a* traverse the upper part. A thermostat in the apartment to be heated controls the fan *b*. The surface of the water may be covered with paraffin, oil &c. to check evaporation and a pressure-relief pipe *o* is provided.

251,344. Soderlund, O., Gram, T., and **Techno-Chemical Laboratories, Ltd.** Jan. 30, 1925.

Heating liquids.—Heat is transferred from one liquid to another by circulating a gaseous mixture of vapour and a carrier between a hotter and a cooler chamber so that the amount of the carrier in the mixture is varied in order to maintain a more or less constant temperature-difference between the carrier and the liquid, the volume of carrier passing different temperature regions of a chamber being varied as the heat-carrying capacity of the carrier varies. Two vertical towers or chambers *a*, *b* filled with transverse plates on edge and spaced apart are connected by ducts. The tower *a* is traversed by a hot liquid which is to be cooled, this liquid at a temperature of 90° C. entering by a pipe a^2 and leaving at a temperature of 50° C. by a pipe a^3. The cold liquid to be heated is supplied by a pipe b^2 at a temperature of 40° C. and is withdrawn by a pipe b^3 at a temperature of 80° C. A fan *c* draws the gaseous medium from the top of tower *b* through duct b^1 and delivers it to the bottom of the tower *a*. This medium rises in tower *a* absorbing vapour from the hot liquid and passes by ducts *d*, d^1, d^2, a^1, which connect

the parts of the towers of corresponding temperatures, to tower *b* wherein the vapour is condensed in stages. In one modification each tower can be divided into two sections of different cross-sectional area. In a further modification in which liquid such as a colloidal solution is heated at high temperature for discharging its slimy properties the process is carried out in

FIG.1.

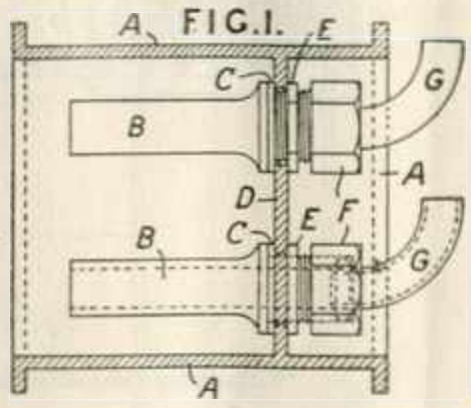


apparatus comprising a warm and cool tower situated side by side and in conjunction with a warm and cool tower arranged one above the other, the lower temperature exchange being at atmospheric pressure and the higher temperature exchange in the superimposed towers being under increased pressure.

251,407. Wilson, G. March 26, 1925.

Heating water.—A junction-box A for closing the opening through which circulation-pipes from a domestic boiler pass from a flue, is provided with a diaphragm D, to which ferrules B on the ends of the pipes are attached by back nuts E and washers C. The continuation pipes G are secured by unions F.

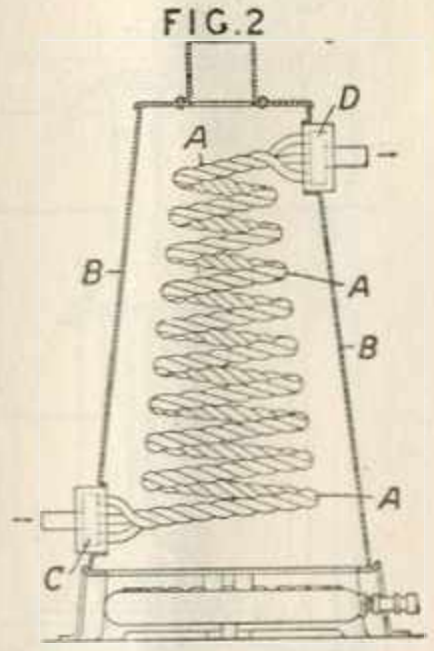
FIG.1.



251,424. Roper, H. J. April 17, 1925.

Water-tube boilers.—A heater comprises a casing B and single or a multiple of composite tubes A formed from a number of tubes twisted together rope-fashion and arranged in coils or other formation in the casing and connected at their ends to an inlet and outlet C, D on the casing. Specification 5918/00, [*Class* 123, Steam generators], is referred to.

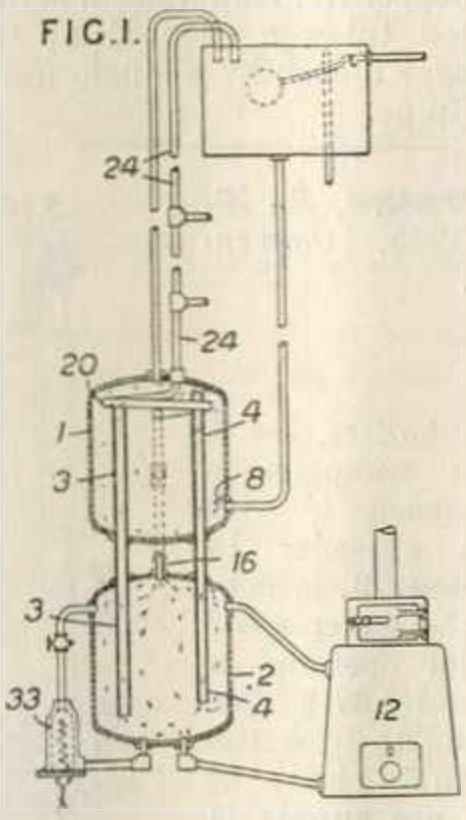
FIG.2



251,465. Fisher, R. R. June 15, 1925.

Heating water.—A water-heater comprises a plurality of superimposed vessels 1, 2, placed in communication with one another by means of two conduits 3, 4. The greater portion of the contents of the lower vessel must first be heated before circulation begins, for example by arranging the pipes 3, 4 to extend nearly to the bottom of the vessel 2. A circulating-boiler 12 may be the source of heat and a reserve electrical heating unit 33 may be fitted. The draw-off pipe 24 may be connected to the top of the vessel 2 at 16 and may extend in a loop 20 through the upper vessel. The cold water inlet is at 8.

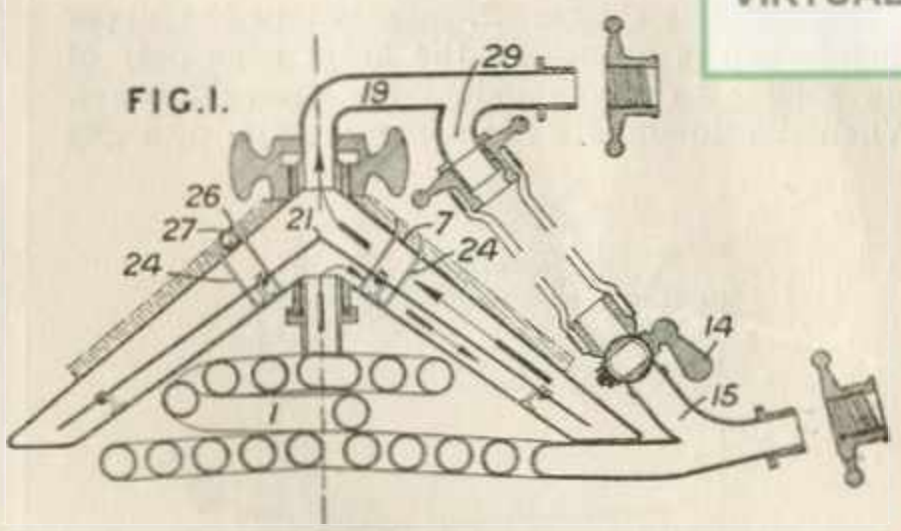
FIG.1.



251,466. Carlin, D. J. F. L. June 15, 1925.

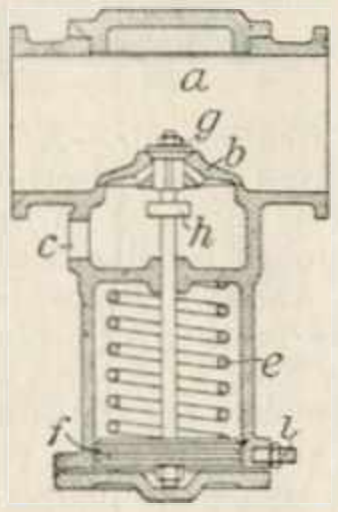
Boilers.—A water-heater forming part of a portable shower-bath consists of a copper tube 1 in the form of a double spiral connected to a funnel-shaped receptacle 7 divided into two chambers by a partition 21 so that water is conveyed down the lower chamber and up the upper chamber to the outlet tube 19. The apparatus is disposed over a source of heat, and is provided with air-ducts 24, which may have closing members 26 attached to chains 27. A by-pass tube 15, 29 for cold water is controlled by a tap 14 as desired.

FIG. 1.



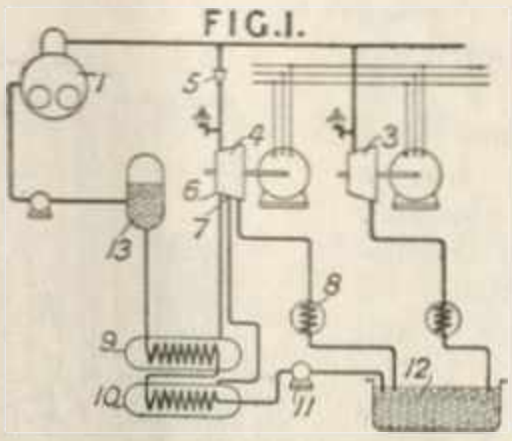
251,560. Knorr-Bremse Akt.-Ges., and **Juliusburger, P.** Dec. 24, 1925.

Feedwater, heating.—In the cleaning of boiler feedwater heaters more particularly for locomotives the scavenging fluid is discharged into the open by means of valves operated mechanically or by pressure without reversing the direction of flow of the scavenging fluid. A pipe *a* leading from the feedwater heater to the boiler is provided with a valve *b* leading to a branch *c*. A piston *f* working against a spring *e* raises the valve *b* by steam pressure from pipe *i*. A smaller valve *g* secured to the piston-rod opens first until a flange *h* raises the valve *b* which only opens when the pressures above and below the valve have been approximately balanced.



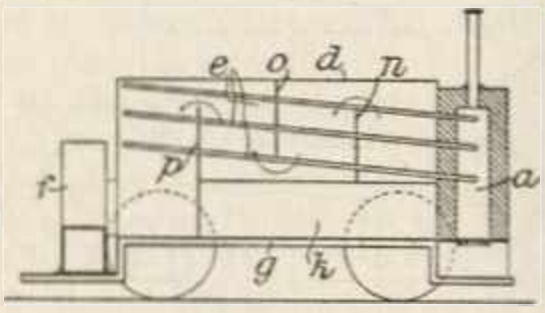
251,598. Siemens - Schuckertwerke Ges. April 28, 1925, [*Convention date*].

FIG. 1.



Feedwater, heating. — In motor installations from which steam is tapped for heating purposes, such steam is taken solely from an auxiliary prime mover 4 which exhausts into a condenser 8 and is arranged in parallel to the main prime mover 3. The turbine 4, which is tapped at two stages 6, 7, receives through a nozzle 5 a constant predetermined quantity of steam. A pump 11 forces water from the tank 12 through feed water pre-heaters 10, 9 to an accumulator 13 supplying the steam generator 1. The turbine 3 is regulated solely in accordance with the load. In a modification the tapped turbine 4 is connected in parallel with the low-pressure section only of the main turbine 3.

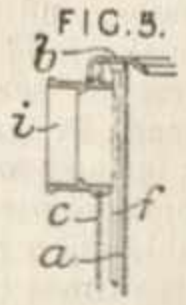
251,720. Wells, G. F. Feb. 25, 1925.



Heating air.—Apparatus for heating air, particularly for use in drying, japanning and enamelling, is carried on a wheeled frame *g* and comprises a fire-box *a* adapted to heat the ends of Perkins tubes *e* which extend, in an upwardly inclined direction, into a chamber *d* having vertical baffles *n*, *o*, *p*, and through which air is drawn from a chamber *k* by a fan *f*. When long tubes are used they are exhausted of air, before being finally sealed, by boiling the contained water, the air escaping through a small hole which is subsequently plugged.

251,785. Radiation, Ltd., and **Yates, H. J.** May 23, 1925.

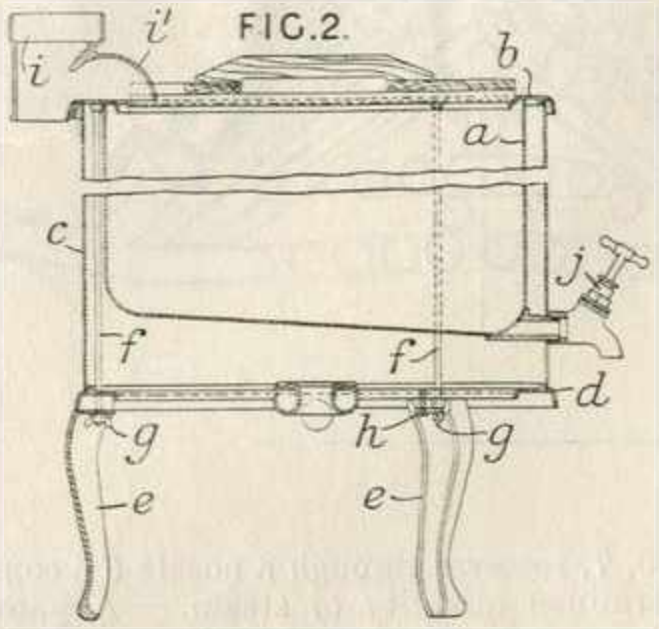
FIG. 5.



Washing-boilers.—The pan *a* is formed integrally with or secured to a top ring *b* and the outer casing *c* is held between the rings *b*, *d* by tie rods *f*. Feet *e* are secured to the bottom ring by the nuts *g* on the tie rods and set-screws *h*. When the flue-nozzle *i* is formed integral with

a steam outlet i^1, Fig. 2, attached to the upper ring, a gap is formed in the lower edge only of the shell *c* to accommodate the draw-off tap *j*. When the flue-nozzle *i* is separate, Fig. 5, a gap

FIG.2.



is also formed in the upper edge and the nozzle is held in it by a groove and the edge of the top ring.

251,895. Mercier, E. F. H. Dec. 15, 1925.

FIG.1.

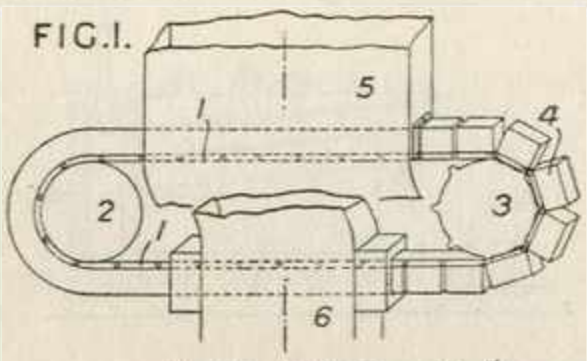
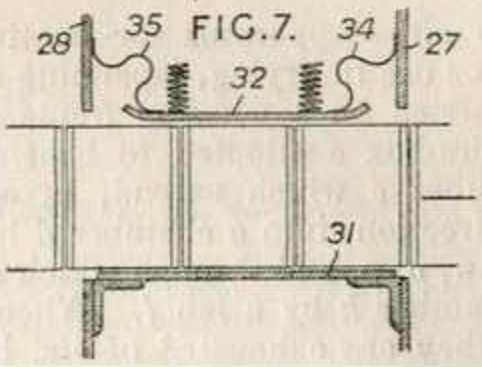


FIG.7.



Heating liquids.—Heat is conveyed from one point to another by means of an endless chain which receives heat at one point in its travel, and releases it at another point. An endless chain 1 passing over wheels 2, 3 consists of bottomless boxes 4 containing metal bars arranged in staggered formation. The upper side of the chain passes through a conduit 5 through which fluid passes, and the lower side through a conduit 6 for the fluid to be heated. The metal bars are arranged across the path of the fluid, and are spaced by discs threaded on them. Fig. 7 shows an arrangement for preventing leakage of gas. This comprises the wall 28 of the flue for heating fluid, and a parallel wall 27 at a distance of about three times the length of one of the boxes of the chain. The latter passes between a metal sheet 31 and a spring-pressed sheet 32 connected with the walls by yielding metal sheets 34, 35. Several different arrangements of conduits for the heating gas and gas to be heated are described. Each side of the chain may pass through one or both of the gas flues, the direction of the currents being preferably such as will make the gases to be heated leave the apparatus through those parts of the chain through which the heating gases enter.

251,963. Modine, A. B. May 6, 1925, [*Convention date*].

FIG.4.

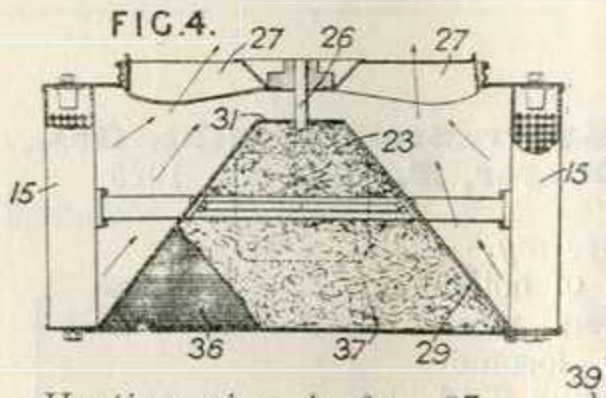
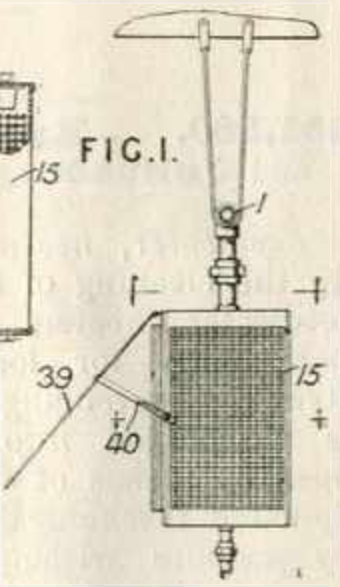


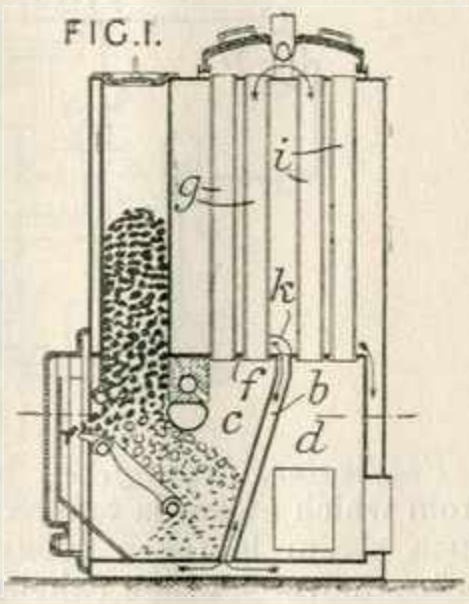
FIG.1.



Heating air.—A fan 27 driven by an electric motor 23 is mounted to draw air through tubular heaters 15. A variable baffle-plate 39, the position of which can be fixed by a strut 40, directs the air flow. The complete apparatus is connected to a steam pipe 1 and a discharge pipe by unions so that it can be rotated to deliver air in any direction. Fig. 4 shows in a cross-section a bent plate 29 forming a chamber in which the motor is set, the shaft 26 passing through an aperture 31 through which air for cooling the motor is drawn by the fan, the air entering at the bottom through a gauze 36 covered by a pad 37 which may be chemically treated.

252,140. Reck's Opvarmnings Co. Aktieselskab. May 16, 1925, [*Convention date*].

FIG.1.



Internally-fired boilers.—A hot-water boiler with a fuel-magazine and flue tubes *g*, *i*, has a lower chamber divided by a double-walled partition *b* into a fire-box *c* and smoke box *d*. The partition *b* connects the lowest part of the water space with that immediately above the tube-plate *f*, and may have, above its upper opening, a curved baffle *k*.

252,163. Löffler, S. May 15, 1925, [*Convention date*].

FIG.3.

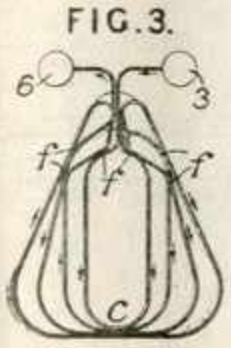
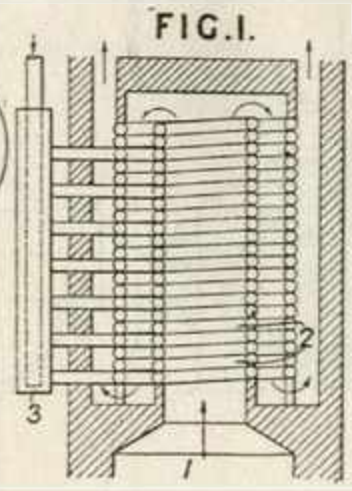


FIG.2.

FIG.1.

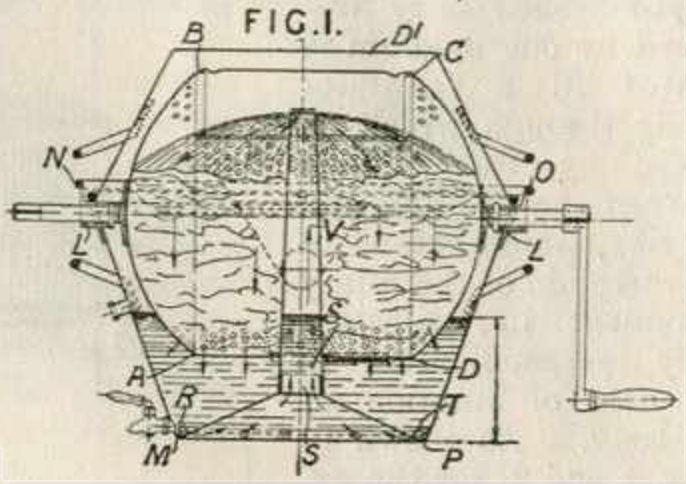


Water-tube boilers; heating gases.—Coiled pipe apparatus for heating fluids comprises units located in the path of heating gases and connected in parallel, each of which consists of coils with their individual turns in juxtaposition and so arranged as to form boundary walls for the gas current and to equalize the heating effect on the fluid in each unit. In an arrangement providing a superposed series of units as shown in Fig. 1, fluid is supplied from a distributor 3 to the units 2 which form concentric flues for gases rising from a combustion chamber, the sectional area of the flues being adapted to maintain uniform or increase the velocity of the gases. Fig. 2 shows the course of the fluid in each unit from the distributor to a collector 6; the piping is increased in sectional area from the stages d^1 to d^2 as the fluid temperature rises. In the form of coil shown in Fig. 3 the weight of the coils is supported at the base *c*, and points *f*, at which the coils mutually contact, transmit lateral forces. In another form in which the units are arranged side by side forming a parallel arrangement of flues several turns are superposed at certain parts of the coil and at others the piping is exposed on all sides to the gases. The connection between each turn is effected alternately by crossed and parallel lengths of pipe, those passing transversely through the gas current being preferably offset so that none lies directly behind the preceding length. Specification 222,823, [*Class* 123 (ii), Steam generators], is referred to.

252,172. Clémencet, L. E. May 12, 1925, [*Convention date*].

Washing-boilers.—A washing-machine adapted for scalding, washing, rinsing and draining materials without handling comprises a container M.N.O.P. with revoluble perforated drum A.B.C.D. mounted in bearings L in the walls of the container, a circulating device R.S.T. with removable nozzle or nozzles V, and a lid D^1 also adapted if removed and upturned to act as a tub or receptacle. In modifications the nozzle or nozzles V may extend into the upper part of the drum from one side of the container or may be mounted within the drum, in which case the drum is retained during the scalding operation so that the lower opening of the nozzle is directly above the tubulure *s* of the double bottom R.S.T. The double bottom R.S.T. may be provided with

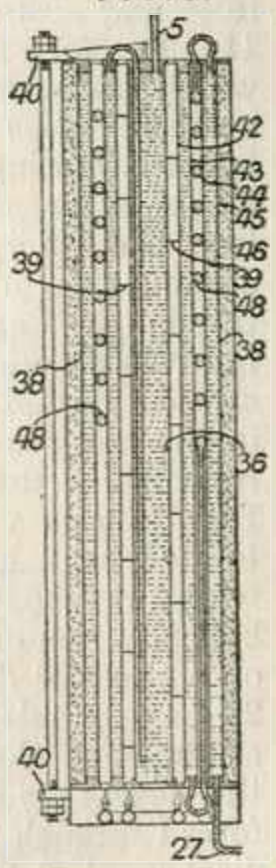
FIG.1.



non-return valves or bent tubular inlets for the circulating liquid.

252,352. Soc. P. Navarre et Fils. May 19, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

FIG.9.



Boilers.—A boiler for heating rinsing water in connection with a dish-washing machine comprises a number of vertically-arranged concentric tubes forming angular spaces to contain water which is heated by fumes from a gas heater or other source of heat located at the bottom of the boiler. In the construction shown in Fig. 9, a central tube 36 is surrounded by tubes 42 - - 46. The water entering by the pipe 27 flows through the annular space between the tubes 44, 45, through a coiled tube 48, through the space between tubes 42, 43 and into the central tube 36 leaving by the pipe 5. Baffle plates 39 and a covering 38 of non-conducting material are provided. The parts are connected by perforated end plates 40. Two other constructions of boiler are described. Specification 227,863, [*Class* 138 (i), Washing and cleaning buildings &c.], is referred to.

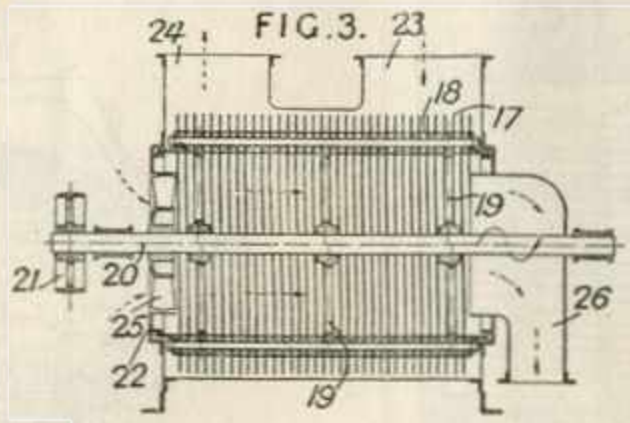
252,354. International General Electric Co., Inc., (Assignees of *Allgemeine Elektricitäts Ges.*). May 23, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

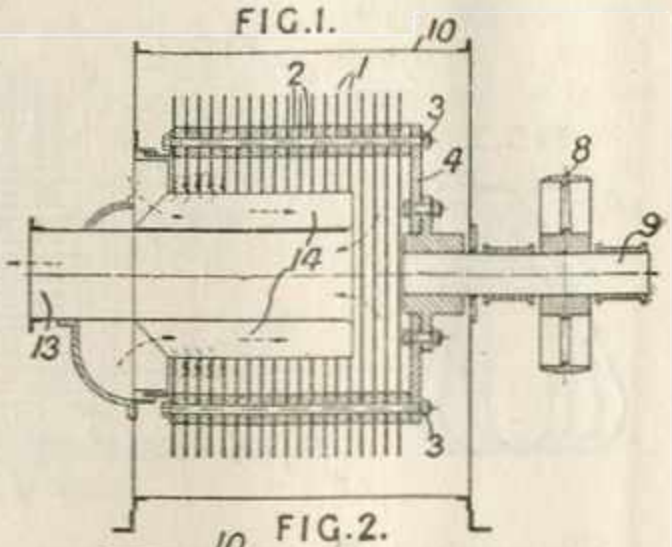
Feedwater, heating.—Water, used for cooling compressed air in blowers or compressors, is utilized as feedwater for steam boilers. Steam-engine condensate from an engine driving the compressor can be used as the cooling medium.

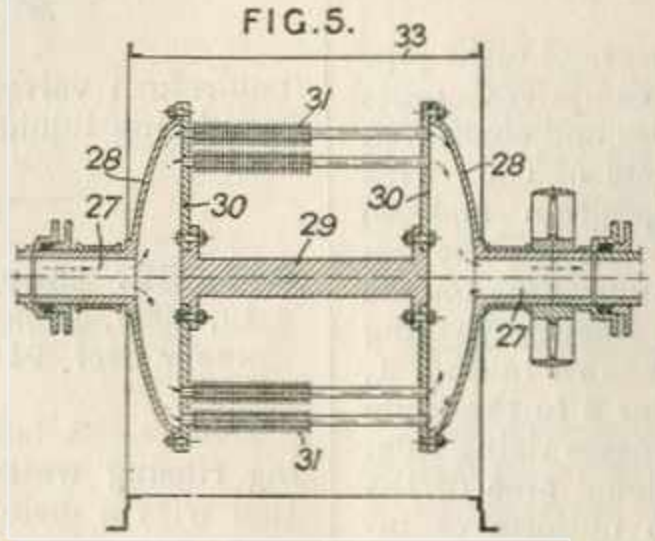
252,373. Maschinenfabrik Ing. H. Simmon. May 19, 1925, [*Convention date*].

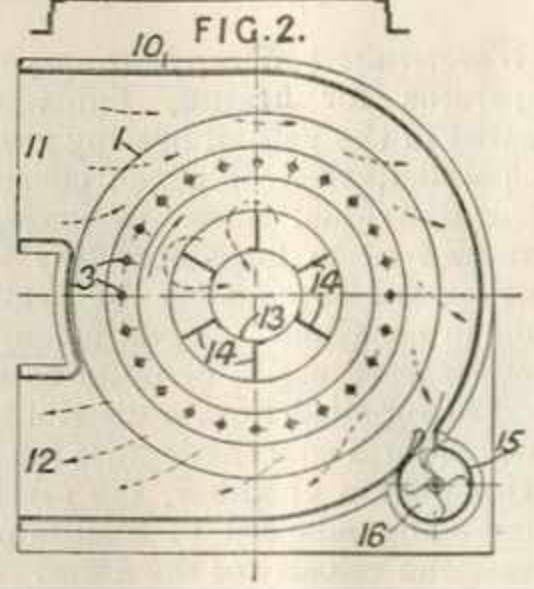
Heating gases; heating liquids.—A hollow drum-shaped ribbed body traversed by one medium is rotated in a ventilator casing through which is moved by the friction between the medium and the ribs, which extend in the direction of the rotary movement i.e. substantially perpendicular to the axis of rotation of the body. As shown in Figs. 1 and 2, for the exchange of heat between gases, the rotatable body comprises sheet-metal rings 1 spaced apart by distance rings and secured to a disc 4 by bolts 3. The disc 4 is fixed to a shaft 9 driven by a pulley 8 and the body is enclosed in a casing 10 with inlet and outlet openings 11, 12 for hot gases, which are entrained and moved through the casing by the rotating body. A pipe 13 having radial blades 14 projects from the side of the casing 10 into the rotary body, cold air being admitted around this pipe and the heated air drawn off through it. Centrifugal action forces the cold air into the spaces between the ribs 1 displacing air already heated, and also forces soot, ashes, &c. in the hot gases through a slot to a chamber 15, from which they can be removed by a worm 16. Fig. 3 shows a modification in which the ribs are formed by a helically wound metal strip 17 between the convolutions of which is arranged a helically wound bar 18 mounted by spiders 19 on a shaft 20 driven by a pulley 21. The casing 22 has an inlet 23 and outlet 24 for hot gases arranged so that the gases are impelled through the casing by the helical rib 17, the air being forced through the rotating body by a fan 25 and discharged at 26. Spiral ribs running in opposite directions may be cast inside and outside the rotating cylinder so that the ribs impel both the hot gases and the air in opposite directions. In further modifications intended for heating liquids the rotatable body comprises two hoods 28, Fig. 5, connected to discs 30 fixed to a spindle 29, the hoods being mounted on hollow jurnals 27 for the supply and discharge of the liquid. Ribbed pipes 31 are mounted between the discs 30, and the body is enclosed in a casing 33 with inlet and outlet openings for the hot gases arranged so that the body moves the hot gases through the casing by fluid friction. Centrifugal action causes the cold liquid in the inlet hood 28 to displace the heated liquid in the pipes 31, rendering a pump unnecessary. Adjustable deflecting plates for the hot gases may be fitted in the casing.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also statements that the ribs may be omitted or replaced by pins. This subject-matter does not appear in the Specification as accepted.



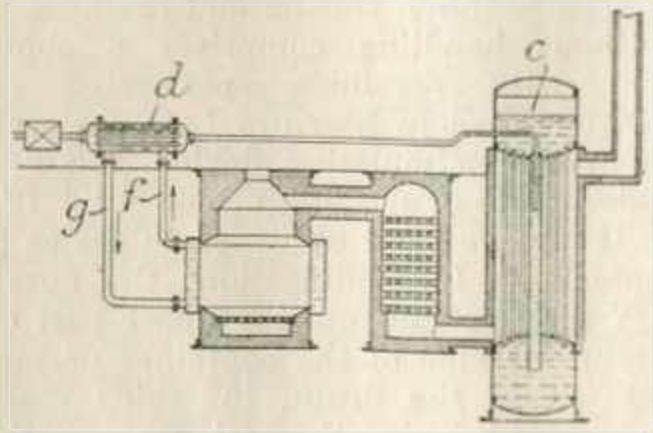




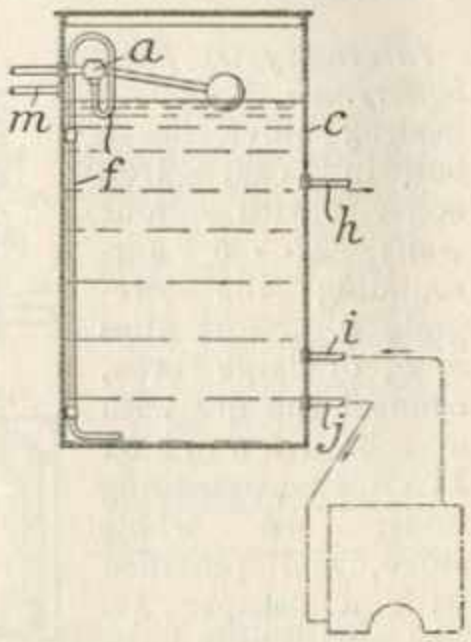


253,088. Bamag-Meguin Akt.-Ges. June 4, 1925, [*Convention date*].

Feedwater, heating. — An economizer for a waste heat boiler included in a water gas plant is heated by the jacket water of the producer. This water at a temperature of 100° C. flows through an uptake pipe *f* to the economizer *d* and returns through a down-comer *g*.

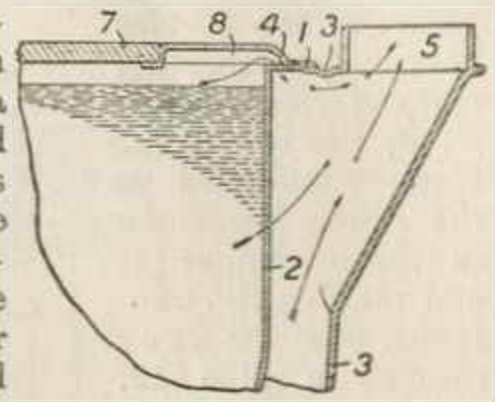


253,398. Hillier, A. H. Nov. 12, 1925.



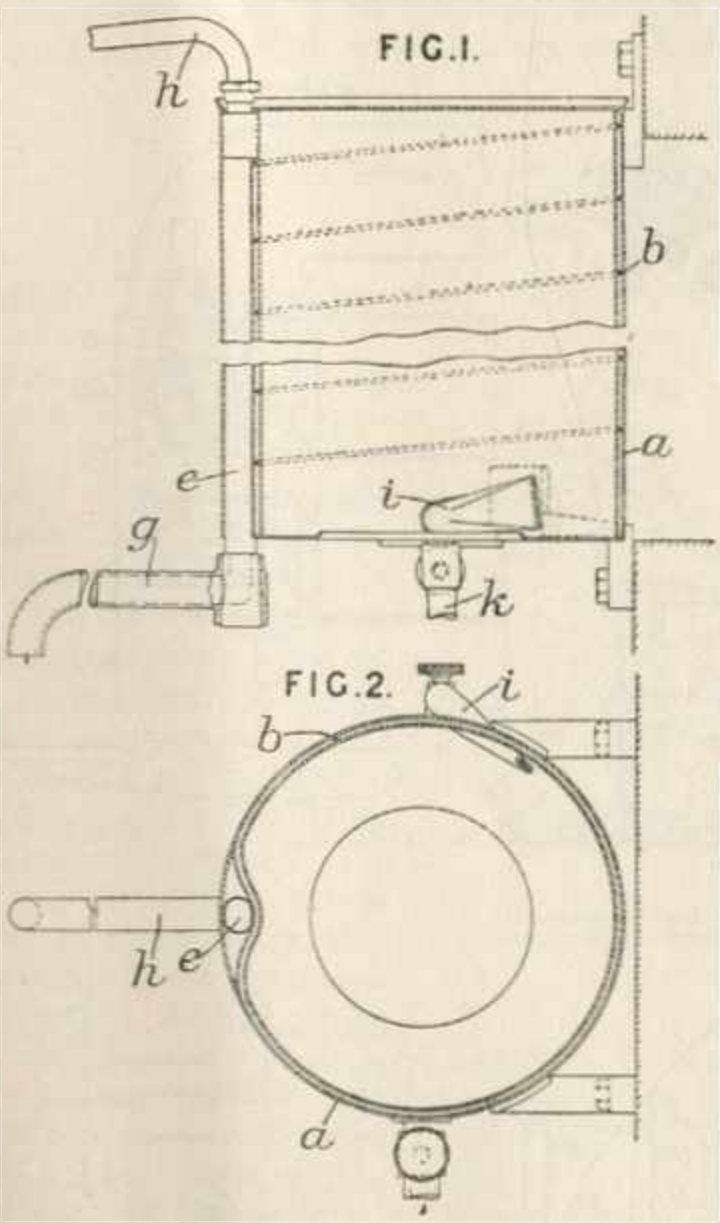
Heating water. — The hot water tank *c* of a hot water supply system is provided with a float-operated cold water inlet valve *a* discharging through a pipe *f* having a double bend as shown and terminating at the bottom of the tank in a horizontal portion. The hot water is drawn off at *h* and the flow and return pipes *i*, *j*, from the boiler enter the tank at points one above the other near the bottom and remote from the pipe *f*. An overflow *m* is provided.

253,748. Smith, H. T. Aug. 14, 1925.



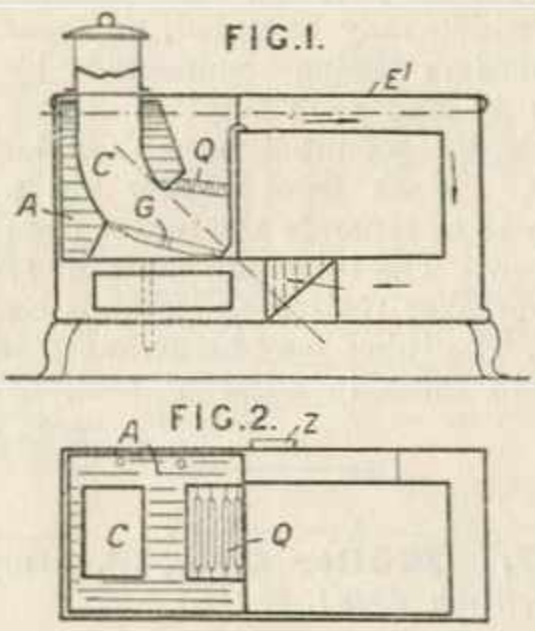
Washing-boilers. — The flange 1 of a pan 2 mounted in a casing 3 is provided with a hole or holes 4 close to the uptake 5 to permit the escape of steam to the flue. The pan cover 7 may have a domed portion 8.

253,847. Hinden, H. April 7, 1926.



Annular boilers; water delivery. — A geyser comprises a double-walled water holding shell *a*, a helically wound wire *b* dividing the thin water space into a helical channel and a gas burner *i* disposed within the shell and tangential to its inner surface. Preferably the burner in inclined upward. Water enters at *k* and after traversing the double shell, is delivered by the pipe *e* and swivel delivery pipe *g*. The outlet *g* also acts as a cock which, when shut, causes water to be delivered by the pipe *h*.

253,937. Nanquette, L. June 19, 1925, [*Convention date*]. *Void* [*Published under Sect.* 91 *of the Acts*].

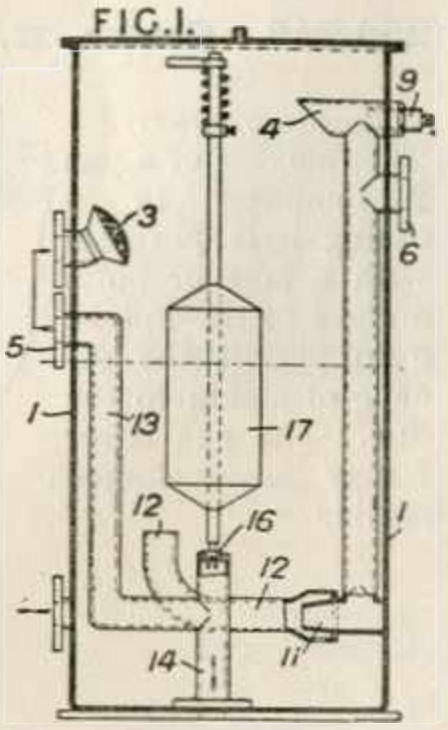


Block-form boilers. — A cooking and central-heating stove comprises a boiler A surrounding a fuel passage C, together with two superposed grates G, Q the former of which is of large area for use when central heating is required, whilst the latter is used in summer for cooking and providing hot water. The gases pass under the hot plate E^1, and around the outer side and bottom of the oven to the outlet Z. The oven and hot-plate are subjected to the direct action of the hottest zone of the grate G, which is entirely covered with fuel.

254,213. Anderberg, A. Aug. 8, 1925, [*Convention date*].

Feedwater, heating. — Steam entering at the inlet 6 passes to two nozzles one, 4, meeting sprayed feed from a jet 3, the other, 11, being submerged in the water collected in the container 1, and tending to circulate this water through a pipe 12. A valve 9 controls the proportion of steam delivered to the two nozzles. The suction side of the pump supplying water to the jet 3, is connected to the union 5 and normally draws fresh water through the pipe 14, 13. If the water in the container accumulates the float 17 opens a valve 16 and the pump draws from the container 1.

FIG.1.



254,585. Cross, W., (*Aktiebolaget Gjuterimaskiner*). Nov. 6, 1925.

Internally-fired boilers. — A central heating stove has a built-in cast iron boiler with four walls 2 - - 5 surrounding the fire-grate 6. Short flues 8, 9, of large area, connect the fire with a soot chamber 11 - - 13 extending under the whole stove, and provided with a damper 14. The wall 3 may have openings to enable the fire to heat the oven. The flues 8, 9 are arranged to be directly beneath a boiling opening in the range-top to facilitate cleaning. The grate 6 is vertically movable and when in the uppermost position, plates 15, 16 may be used to mask the side walls of the boiler.

FIG.1.

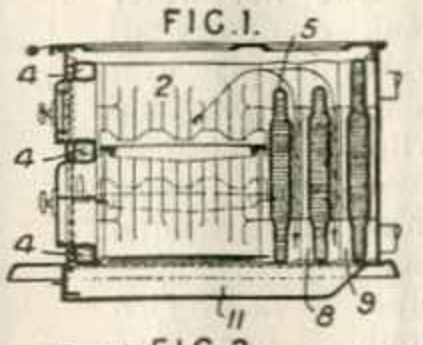
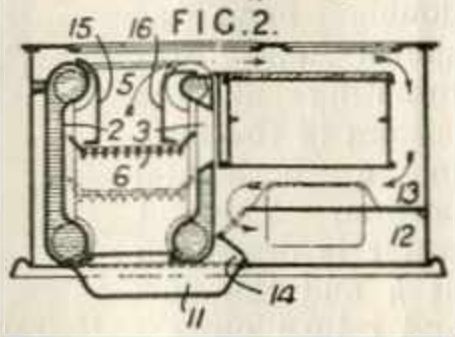


FIG.2.



254,702. Sturtevant Co., B. F., (Assignees of *Derry, G. C.*). July 6, 1925, [*Convention date*].

Feedwater, heating. — An economizer comprises a plurality of sections each consisting of front and back steel headers 6, 7, joined by steel tubes 8 which may be gilled, adjacent front headers being connected by U-bends 17 and each section being independently mounted as on angle-irons 23. Each front header has a partition 18 to separate the inflow from the outflow. The tubes are centrally supported on a cross-member resting at its ends on the angle-irons 23. The tubes may be arranged in staggered relation to those in adjacent sections.

FIG.4.

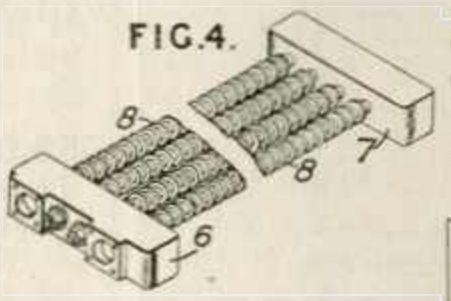
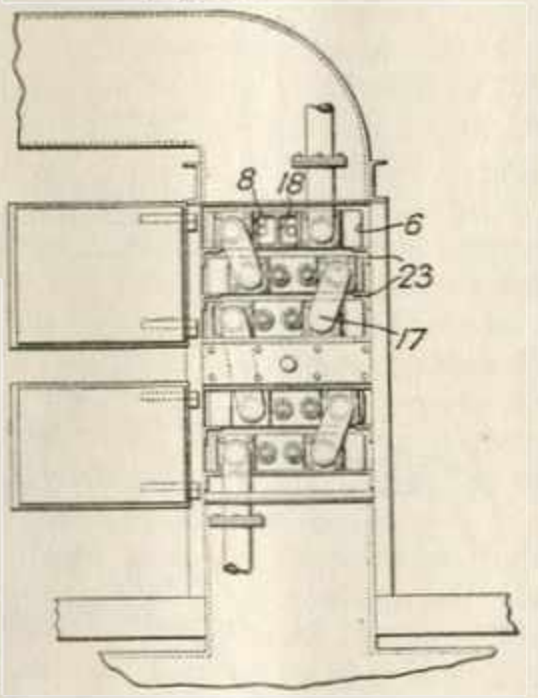
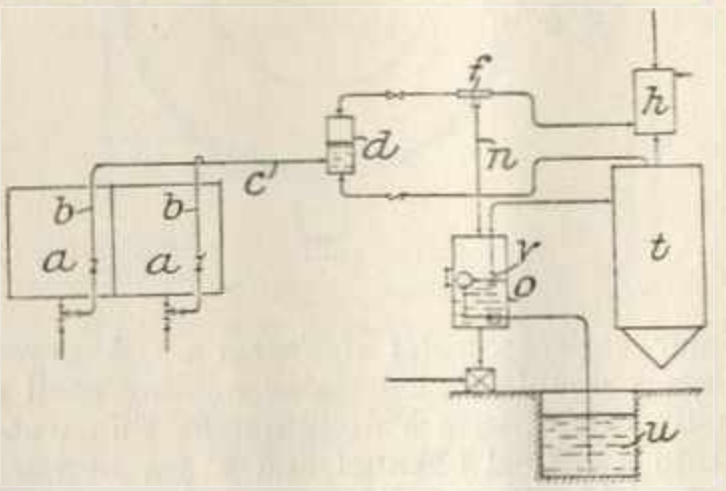


FIG.3.



254,707. Müller Ges., P. July 3, 1925, [*Convention date*].

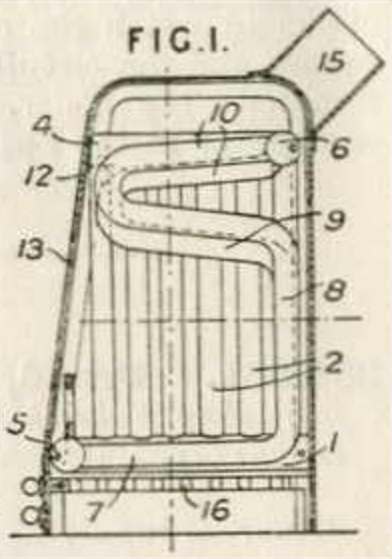
Feedwater, heating. — In degassing feedwater under reduced pressure, the ejector used to create the partial vacuum is actuated by boiler blow-down water or by steam generated from blow-down water by reduction of pressure. The steam generated in a vessel *d* connected to the boilers *a* by blow-down pipes *b*, *c*, is passed through an ejector *f* connected to the feed tank *o*, and is led, together with gases from the feedwater, to a pre-heater *h*. The feedwater passes from the pre-heater to a purifier *t* and thence to the feed tank. Water of condensation from a collector *u* may also be fed to the feed tank.



254,992. Deerns, P. W. Feb. 15, 1926.

Water-tube boilers. —A cage-shaped self-contained water-tube heating unit constructed with tubes forming sides 2, 8 surrounding the fire space with horizontal parts 7 forming the grate, is fitted within a closed casing 12 provided with filling gearing 13, air regulating means 16 and an outlet 15 at the top. The tubes may pass across the top as at 9, 10 and in that case are staggered to allow free passage to the gases. The tubes may be connected to upper and lower **U**-shaped members 4, 1, the transverse parts 6, 5 of which are at back and front respectively. Specification 241,712 is referred to.

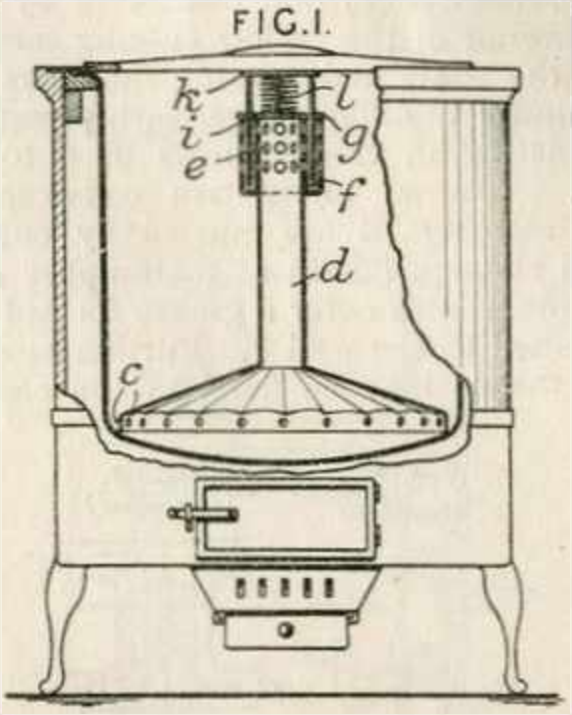
FIG. 1.



254,995. Saare, W. Feb. 20, 1926.

Washing-boilers. — A bonnet-like insertion for promoting circulation in wash boilers and having a perforated circumferential edge *c* and an upwardly extending tube *d* with openings *e* at its top end, is provided with a surrounding apertured cylinder *f* which is rotatable to vary the size of the outlet passages. A disc *k* between which and a cover *g* of the cylinder is located a spring *l* is guided by stems *i* passing through the cover, the insertion being pressed resiliently upon the bottom of the boiler by the lid.

FIG. 1.



255,418. Sandberg, A. July 18, 1925, [*Convention date*].

Heating liquids. — In apparatus of the kind described in Specification 231,192, [*Class* 51 (i), Furnaces and kilns, Combustion apparatus of], in which the heat transferring material comprises rotating discs 16 of metal, fire-clay, &c. disposed parallel to the paths of flow of the media, the spacing and partitioning members 4 between the discs are slidably mounted on rods 24 arranged parallel to the shaft 18 of the discs. The casing 1 within which the discs 16 rotate is divided centrally by walls 2, 3 and the spacing members 4, forming two channels 5, 6 for the media circulated by fans 11, 12, there being guide members 15 in the upper part of the casing to give an even flow over the whole section. The discs 16 have central bosses 17 and are mounted on the shaft 18 by a feather and groove 21 allowing of endwise movement, the spacing members 4 are also threaded on the shaft 18 between the discs, and the spacing members and discs are pressed together by adjustable springs 29, 30 on the shaft 18 and rods 24 respectively. The spacing members may be flexible.

FIG. 1.

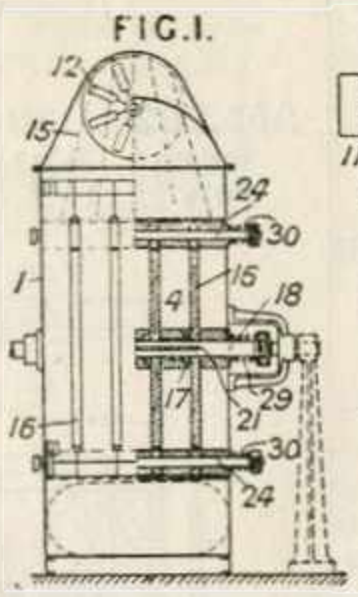
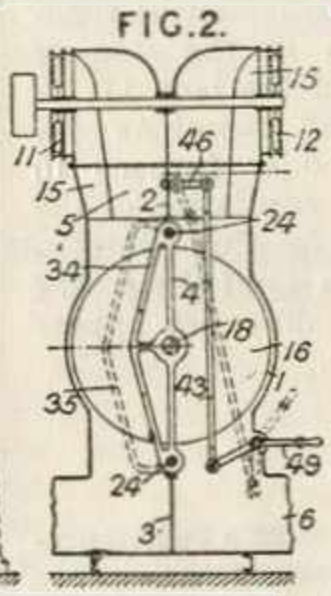


FIG. 2.



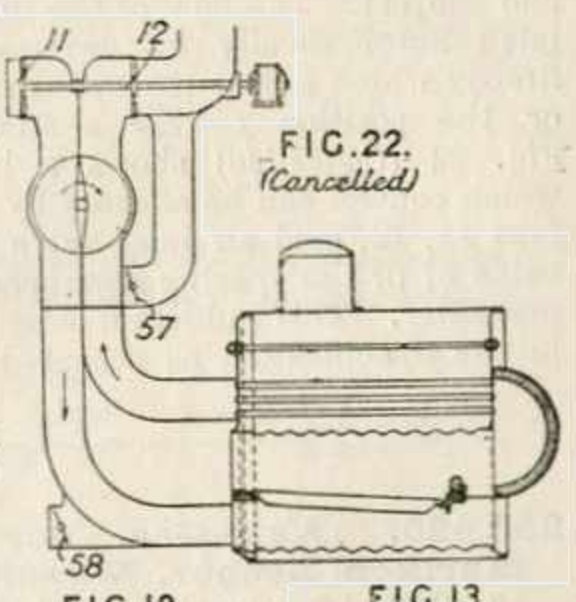


FIG. 22. (Cancelled)

FIG. 18. (Cancelled)

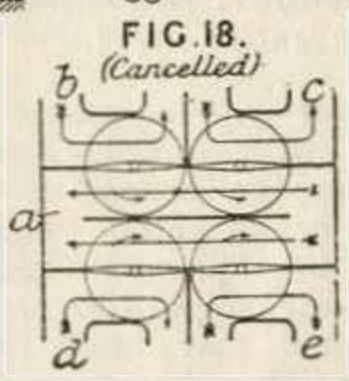
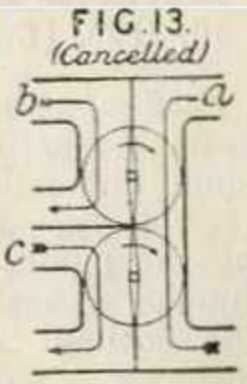


FIG. 13. (Cancelled)



The Specification as open to public inspection under Sect. 91 (3) (a) comprises also a form in

which the spacing members have extension members 34, 35 making the passage for one medium smaller than that for the other. Adjustable spacing members 43 are pivoted by a link 46 to the wall 2 and adjusted by a handle 49 to vary the area of passage between the discs. The shaft 18 of the rods 24 may be hollow as shown in Fig. 7 (cancelled) and connected by holes 38 to the interior of the hollow spacing members 34 so that the shaft and spacing members may be placed under a different gaseous pressure from those existing in the channels 5, 6 to prevent leakage. In an alternative construction the spacing members 4 are carried by one rod 24 threaded through bosses at their upper ends and at their other ends enter a groove formed between plates bolted to the wall 3. Further spacing and guiding means may be fixed to the casing, and

FIG. 7. (Cancelled)

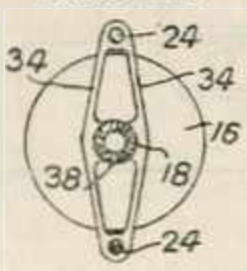


FIG. 19. (Cancelled)

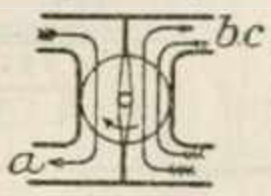


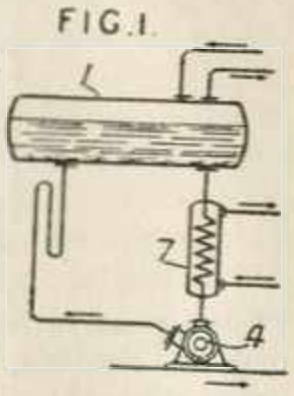
FIG. 21. (Cancelled)

act on the periphery of the discs. Figs. 13, 18, 19, and 21 (cancelled) show various ways of building up apparatus for heat exchange between different media *a* - - *e;* these constructions are stated to be also applicable to the apparatus shown in Specifications 231,192, [*Class* 51 (i), Furnaces and kilns, Combustion apparatus of], and 245,111. The flow of the media can be regulated automatically by devices in the flue or firebox which adjust the speed of the fans 11, 12 or the position of the spacing members 43. Fig. 22 (*Cancelled*) shows a boiler furnace in which control can be effected by regulation of the fans 11, 12, cold air inlet valve 58, flue bye-pass valve 57 or the spacing members 43 of the rotary preheater. This subject-matter does not appear in the Specification as accepted.

255,425. Akt.-Ges. der Maschinenfabriken Escher, Wyss, et Cie. July 16, 1925, [*Convention date*].

Feedwater, heating.—In a steam boiler 1 with forced liquid circulation the boiler water is cooled before entering the pumps 4 by passing through a heat-exchanger 7. The cooling liquid may be feed-water and the heat-exchanger may form part of the water space of the boiler. In a modification the heat exchanger forms the lower drum of a separate low-pressure steam boiler.

FIG. 1.

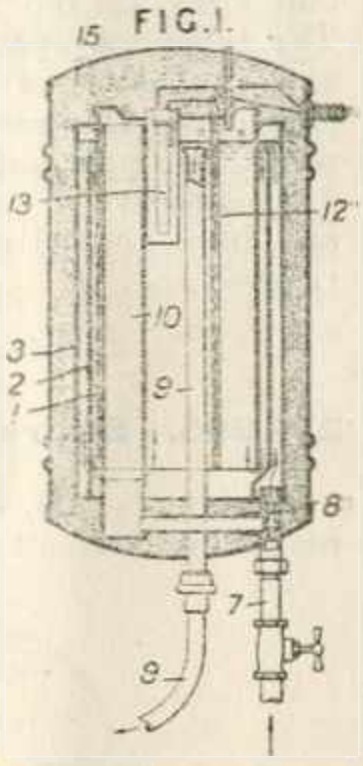


The Specification as open to inspection under Sect. 91 (3) (a) comprises also the further modification in which the circulating liquid is a heat-carrier and the circuit has no direct communication with the boiler. This subject-matter does not appear in the Specification as accepted.

255,631. Croad, A. K., (*Naamlooze Vennootschap Fabriek van Instrumenten en Electrische Apparaten Inventum*). July 8, 1925.

Water supply and delivery.—A pressure-fed electric water heater is provided with means in direct communication with the inlet pipe 7 for automatically preventing dripping or leakage from the outlet 9 when the inlet is closed. This means comprises a water-levelling chamber 10 connected to an injector 8 on the inlet pipe. Water flows from the container into the chamber 10 when the inlet is closed and is ejected therefrom when the inlet is re-opened. A non-return valve may be fitted in the inlet pipe.

FIG. 1.



255,802. Niederbayerische Cellulosewerke Akt.-Ges., and **Schneider, A.** July 22, 1925, [*Convention date*].

FIG. 1.

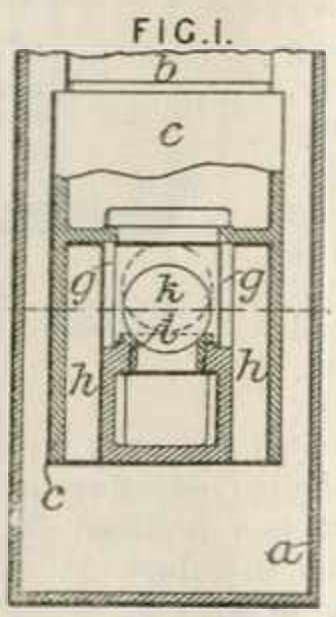
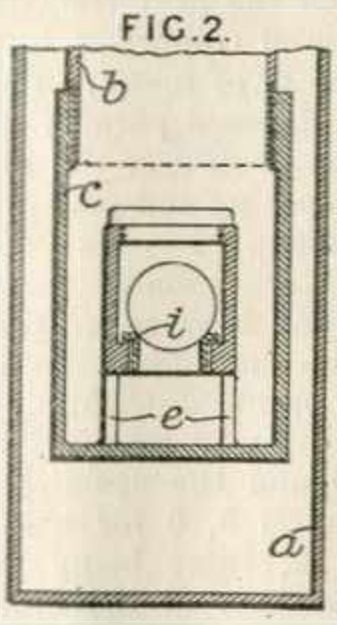


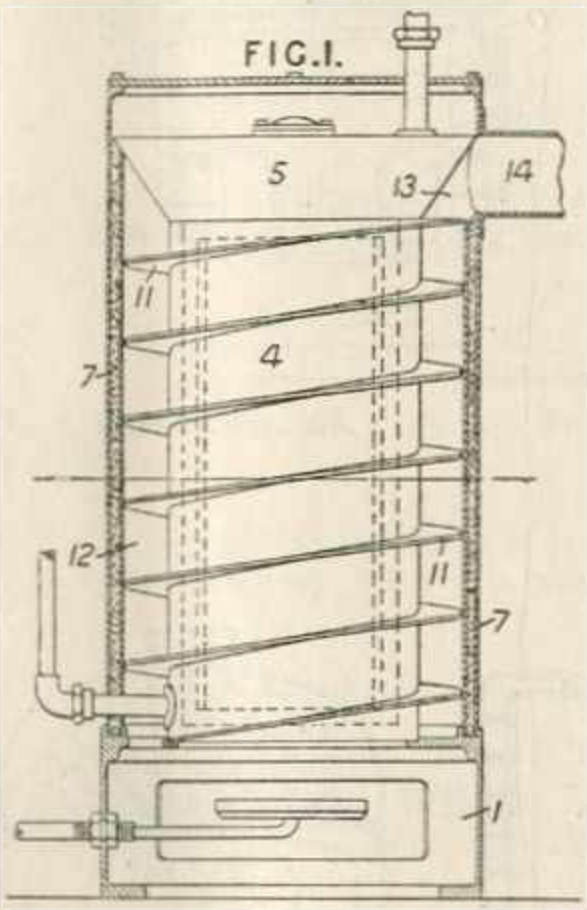
FIG. 2.



Water-tube boilers.—A backward flow of water or other fluid in the tubes of a steam boiler or a preheater is prevented by fitting a non-return valve in the tubes at the place where the normal direction of the circulation is reversed. The lower end of the inner tube *b* of a boiler Field

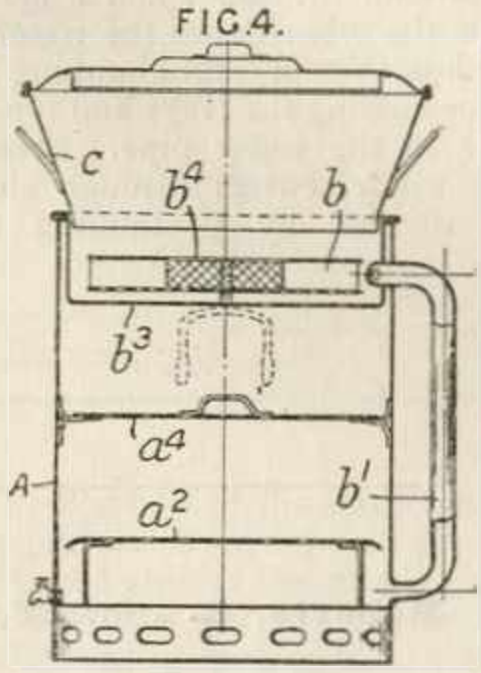
tube element is formed with an extension *c* containing a ball valve *k*, which prevents the reversal of flow of the water in its circulation down the inner tube and up the outer tube *a*. The water flows from the tube *b* through ports *e* upwardly through the valve controlled opening *i*, then through ports *g* opening into passages *h* in communication with the outer tube *a*.

256,043. Connor, F. J. July 20, 1925.



Block-form boilers.—A casing 7 contains centrally a boiler 4 provided with an overhanging top port 5 beneath which is an annular flue 15 communicating with the chimney 14. In the annular space between the boiler 4 and the casing a plate 11 is so arranged as to form a spiral flue 12 extending from the combustion chamber 1 to the flue 13.

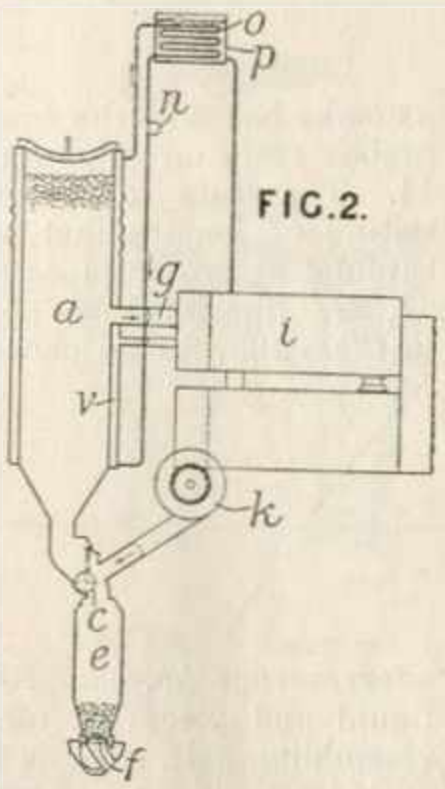
256,336. Hopkins, A. D. May 9, 1925.



Washing-boilers. — A washing-machine comprises a boiler A having upper and lower perforated plates a^2, b^3 and if necessary a central perforated plate a^4 between which the clothes are confined. An external pipe b^1 is provided to direct the rising hot water on to the blades of a paddle wheel *b* which assists in the circulation and agitation of the water. A soap container b^4 may be housed in the paddle wheel and a vessel C for heating water may be substituted for an ordinary cover.

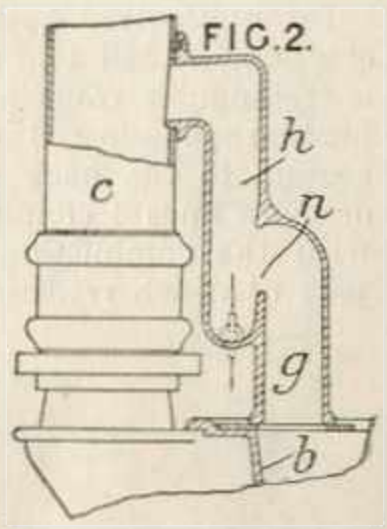
256,727. Woodall-Duckham (1920), Ltd., and **Reber, J. W.** May 25, 1925.

Feedwater, heating. — In apparatus for cooling coke by circulation of a stream of gas through the coke chamber *a* and a steam generator *i*, the chamber *a* is surrounded by a water-jacket *v* arranged in circuit with a heating-coil *o* in the feedwater tank *p*, a circulating pump *n* being provided. Specifications 2981/07, 15053/07, and 12070/08, [all in *Class* 55, Gas manufacture], are referred to.



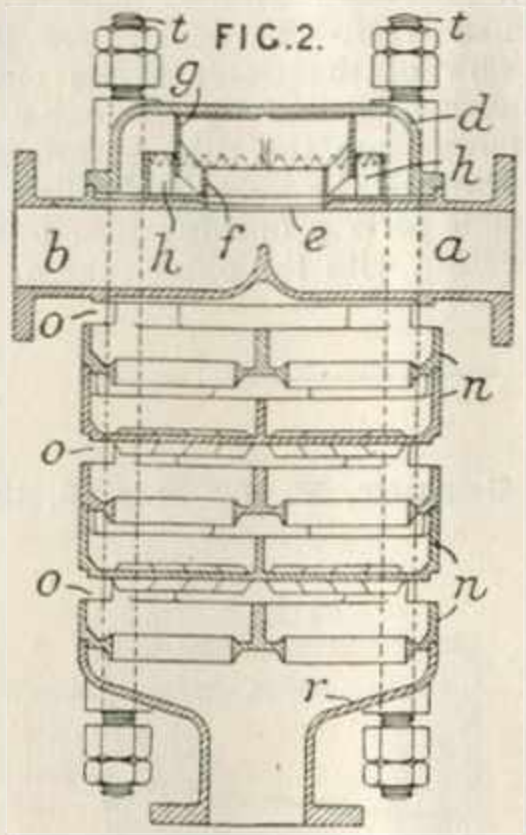
256,793. Gillespie, W. J. S., Gillespie, P., and **Gillespies, Ltd.** Aug. 25, 1925.

Washing-boilers.—For carrying off steam from the pan a conduit is constructed having two portions the upper *h* of which communicates with the chimney *c* and the lower *g* with the pan *b*. The parts are arranged out of alignment and communicate with one another at *n* above the closed lower end of the upper portion, a pocket for fluid or other matter being thus formed.

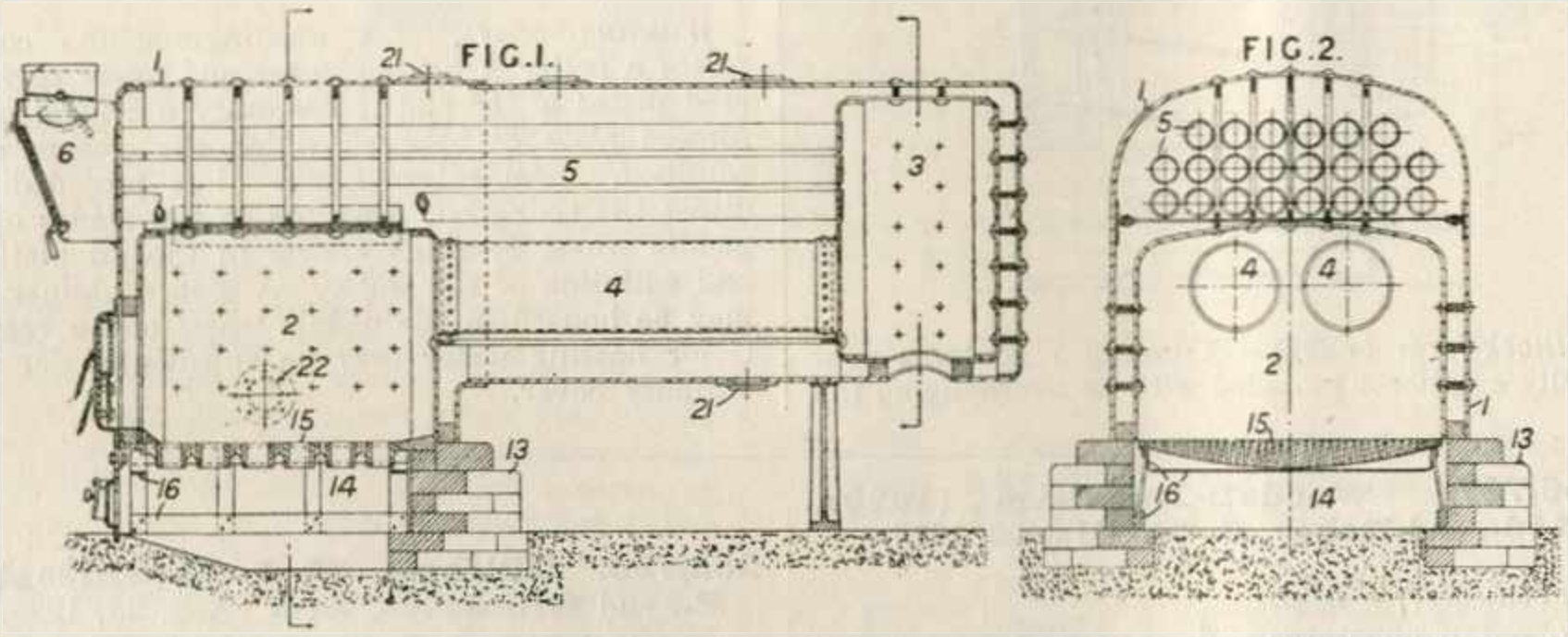


256,811. Stephenson, B., and **Pearn & Co., Ltd., F.** Sept. 25, 1925.

Feedwater, heating.—A feed-heater for fitting in the steam space of a boiler comprises a water inlet pipe *a*, *b* disposed transversely across the top of the heater and having an outlet *e* at the upper side with annular weir or baffle plates *f*, *g*, *h*, there around delivering to a tray formed with and around the pipe, and a series of trays *n* one below the other under the water inlet, with staggered slots therein, and clamping means such as bolts *t* for holding the trays and top and bottom covers *d*, *r* to the water pipe. Steam, to heat the falling water, enters through slots *o*. The trays are divided by upstanding ridges into sections.



256,835. Roberts, A. Nov. 26, 1925.



Internally-fired boilers. — Return-tube boilers comprise a shell 1, a rectangular firebox 2 within a rectangular front portion of the shell, a combustion chamber 3 of similar shape in cross-section to the back end of the boiler, and one or more flues 4 connecting the firebox back plate with the combustion chamber, from the upper part of which return-tubes 5 extend forwardly to a smoke box 6 at the front end of the boiler. The firebox rests on brickwork 13 forming an ashpit 14. The grate 15 is supported on a frame consisting of longitudinal and transverse bars 16. Circulating water pipes are connected to flanges 21, 22. Specifications 86/82 and 13589/92, [both in *Class* 123, Steam generators], are referred to.

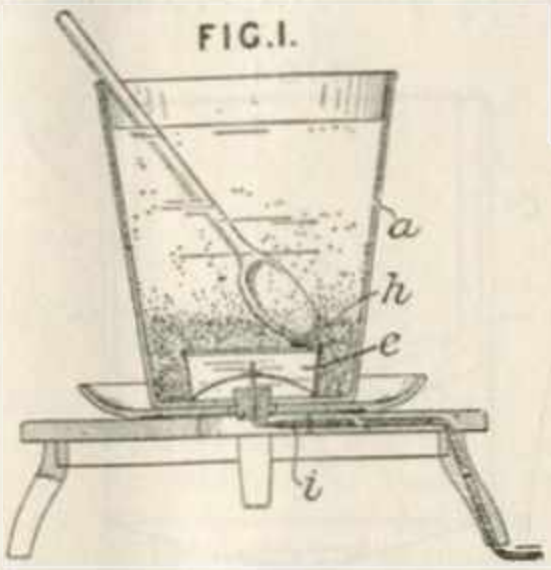
256,977. Drukker, M., (Assignee of *Stroschein Ges., J. E., and Hönig, P.*). Aug. 12, 1925, [*Convention date*].

Heating liquids. — Apparatus for displaying effervescence &c. comprises a vessel *a* containing liquid and pieces of marble or other substance resembling salt. Air is blown by way of a concealed pipe *i* into a chamber *e* covered tightly by a porous top *h* of sintered glass or clay, through

which the air percolates into the liquid.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the application of

FIG.1.

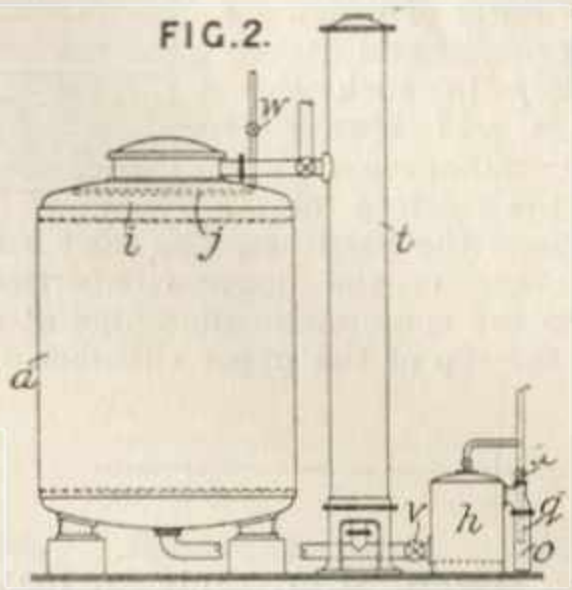


the device to heating liquids. This subject-matter does not appear in the Specification as accepted.

257,600. Ullmann, G. Aug. 28, 1925, [*Convention date*].

Digesters. — High-pressure boiling apparatus are cleaned simultaneously with the release of the pressure by spraying into the boiler water or other cleaning fluid. In the example shown which incorporates a heater *t* through which the lye circulates, the valves *v*, *w*, *x* are opened so that vapour, and lye carried over, pass through the heater *t* to the receiver *h* before passing to

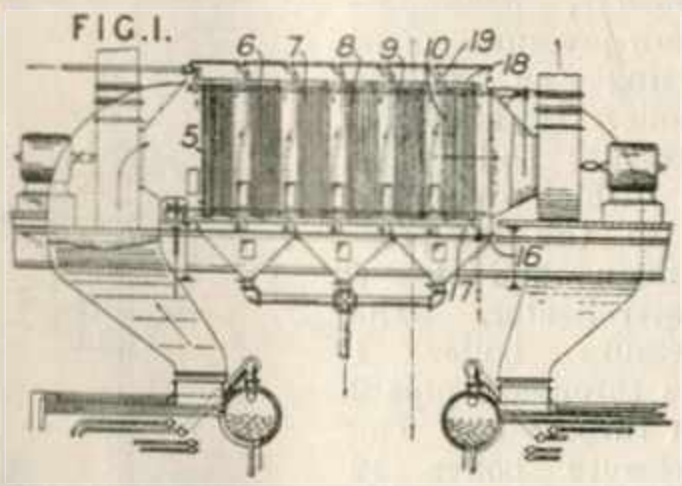
FIG.2.



the outflow *o*. Water is at the same time admitted through the perforated pipe *j* into the dome *i*, of the digester *a* and also by the pipe *q* to the nozzle *o*. In this way the heater is cleaned and the vapour passing out is cooled. The water may be admitted at the top or bottom of the boiler.

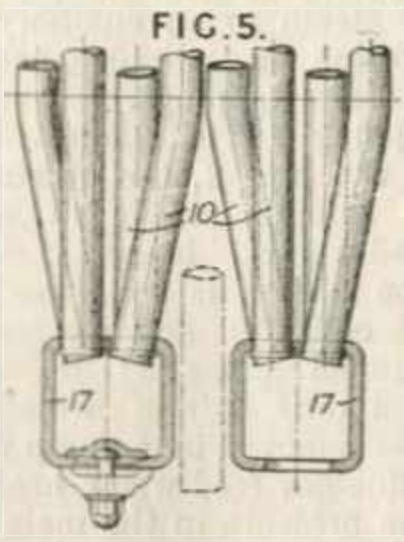
258,088. Babcock & Wilcox, Ltd., (*Babcock & Wilcox Co.*). Sept. 17, 1925.

FIG.1.



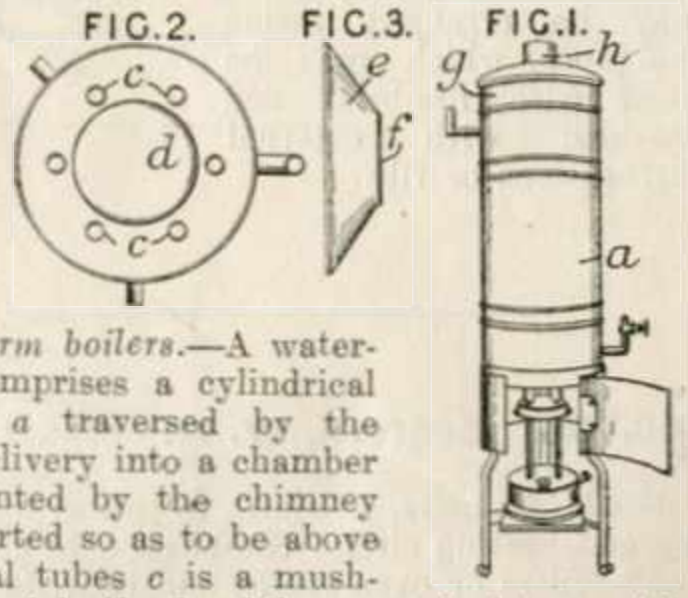
Feedwater, heating. —An economizer comprises successive series of groups 5 - - 10 of economizer tubes spaced along the length of a flue with the headers 17, 18 disposed longitudinally, upper and lower cross boxes 16, 19 being connected to each set of inlet and outlet headers respectively and other connections being arranged so that water flows in parallel through the tubes of each group and successively through the group. The ions of tubes in each header may be straight or staggered and alternate tubes in each row may be bent outward as shown in Fig. 5 to allow clearance space for the gases. The headers or pairs of headers may be spaced apart sufficiently to allow of a tube for replacement being passed between them as shown in dotted lines, Fig. 5.

FIG.5.



258,096. Broom, J. W. Oct. 8, 1925.

FIG.2. FIG.3. FIG.1.

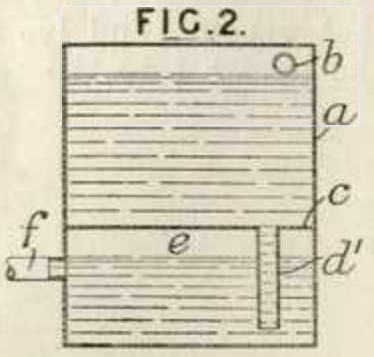


Block-form boilers.—A water-heater comprises a cylindrical container *a* traversed by the tubes *c* delivery into a chamber *g* surmounted by the chimney *h*. Supported so as to be above the central tubes *c* is a mush-room-shaped baffle *d*, while a coned plate *e* with central aperture *f* is fitted in the chamber *g* above the baffle *d*.

258,108. Wood, G. H. Bennett-. Oct. 27, 1925.

Heating water; block-form boilers. — A tank *a* is divided by a partition *c* into two compartments the lower of which is directly heated and has an outlet *f* in such a position as will always leave an air-space *e* between the surface of the water and the partition. The inlet *b* may be at the bottom of the upper compartment, in which case the commmunication-pipe d^1 extends nearly to the top of the upper chamber.

FIG.2.



258,388. Owen, B. J. July 22, 1925.

Heating air.—Internally heated pipes or tubes over which the air is passed are provided with external angularly-adjustable baffle plates disposed around and mounted on the periphery of each pipe to regulate the direction of flow of the air over the pipes. As shown applied to a square heating pipe a^1 the baffles b^1 are arranged transversely and pivoted to the pipe at c^1, the series of baffles along each side of the pipe being simultaneously adjusted by rods d^1. In a modification applied to a circular pipe the baffles are arranged longitudinally of the pipe and positioned equidistantly around the periphery, the baffles of several adjoining pipes being adjusted simultaneously. Deflecting vanes may be arranged inside the pipes, which may be lined with fire-brick and provided with external corrugations or ribs.

FIG.1.

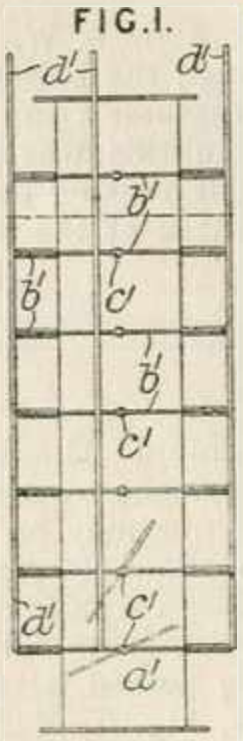
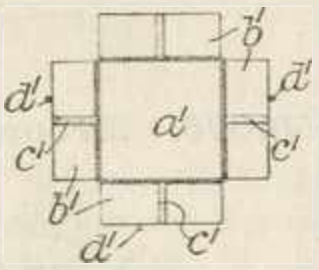


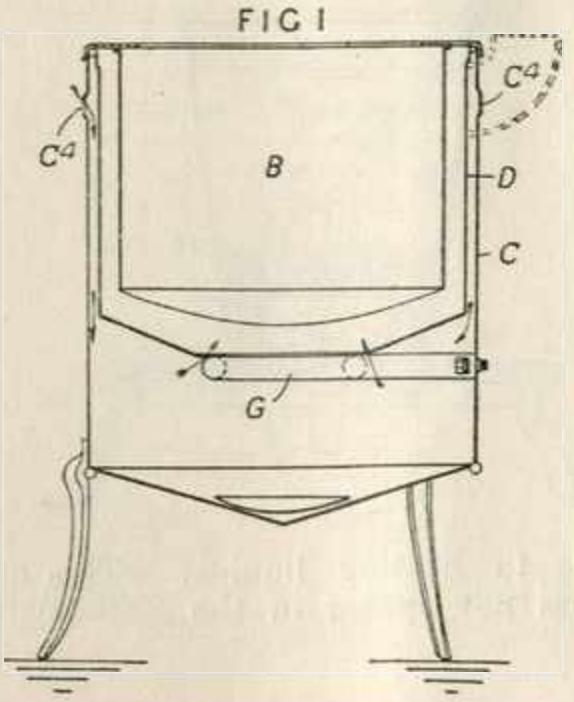
FIG.2.



258,722. Redfern, W. D. Sept. 1, 1925.

Washing-boilers.—Relates to means for supplying and heating air for combustion in gas-heated wash-boilers or oven-stoves and consists in combining within a closed-bottom casing C a boiler B, or an oven, and an intermediate casing D contracted at its lower end so as to fit round a gas burner G the primary air supply to which is drawn from the interspace between the casings C, D. Air is admitted at the top of the interspace through openings C^4. The casing C may

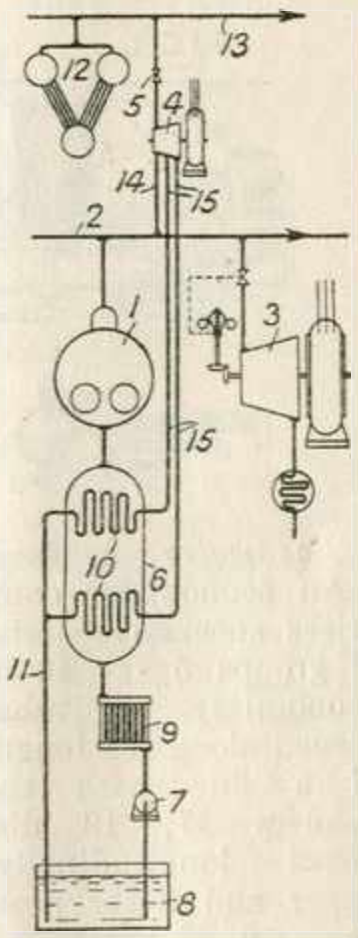
FIG 1



be surrounded by a further casing to which air enters at the bottom and the oven may be surmounted by a hot-plate. Specification 136/82, [*Class* 126, Stoves &c.], is referred to.

258,771. Jackson, L. Mellersh-. (*Siemens-Schuckertwerke Ges.*). Jan. 23, 1926.

Feedwater, heating.—To a low-pressure plant comprising an engine and boiler is added a high-pressure boiler and engine which supplies steam to the low-pressure main and to a feed-water heater. The low-pressure boiler 1 supplies through a pipe 2 a main turbine 3. The high-pressure boiler 12 supplies through a pipe 13 steam to an auxiliary turbine 4 which has three tappings. One tapping 14 is connected to the pipe 2, the others 15 supply steam to a feed-water heater 6. The steam is condensed in coils 10 and passes through pipes 11 to a feed tank 8 from which it is removed by a pump 7 which forces it through a flue-gas feed-water heater 9 into the heater 6. The pressure in the main 2 regulates the valve 5 of turbine 4; the turbine 3 is regulated according to the load. Reciprocating engines may be used in lieu of turbines.



259,655. Hirst, A. S. N. July 11, 1925.

FIG.1.

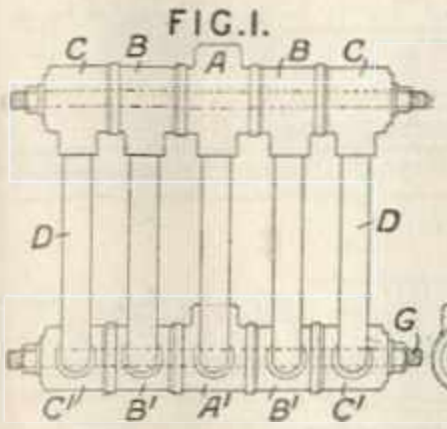
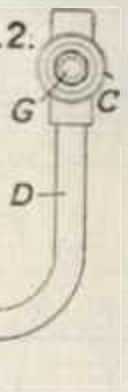


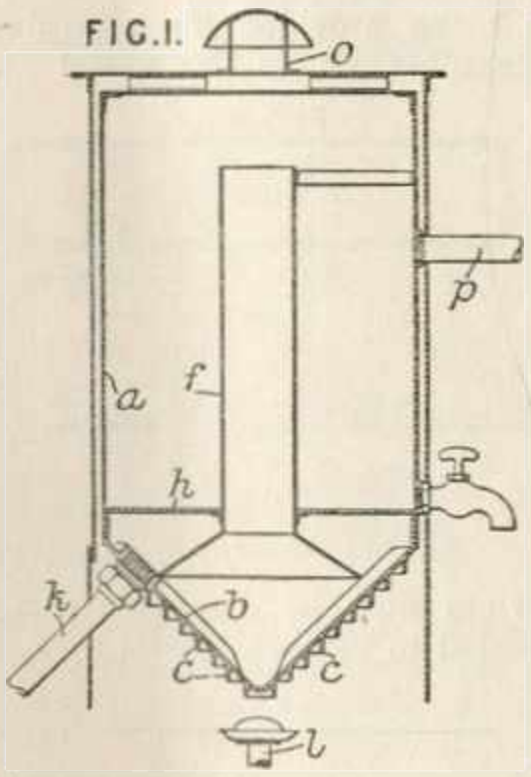
FIG.2.



Water-tube boilers. — A fire-back boiler for domestic grates comprises a number of units each consisting of a curved copper tube D screwed at the ends into upper and lower header-sections A, B, C, A_1, B_1, C_1, assembled side by side and held together by bolts G passing through the upper and lower header-sections respectively, the boiler being mounted with the vertical parts of the tubes at the rear of the fire grate, the lower horizontal parts extending backwards into a flue passage passing beneath the firebrick back of the grate.

259,797. Highfield, J. S. Dec. 8, 1925.

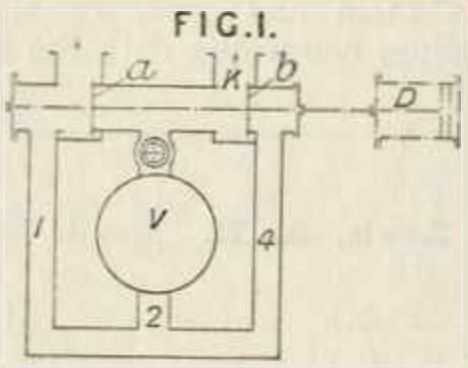
FIG.1.



Block-form boilers comprise a container *a* having a conical or pyramidal base *b*, which is heated at its apex by an oil or gas burner *l*, and which is provided with ribs *b*, *c* on its internal and external surfaces respectively, and a water-circulation tube *f* having a splayed end which rests upon the ribs *b*. The container is enclosed by a casing having an outlet *o* for the products of combustion from the burner. In use, cold water is admitted through the tube *k* into the bottom of the container and flows between the ribs *b* into the space beneath the splayed end of the tube *f* through which it passes to the top of the container and thence downwardly and through apertures in the baffle *h* back to the bottom of the container. The heated water may pass through the tube *p* to a storage vessel or it may be drawn off directly for use.

259,802. Knorr-Bremse Akt.-Ges., and **Juliusburger, P.** Dec. 24, 1925.

FIG.1.

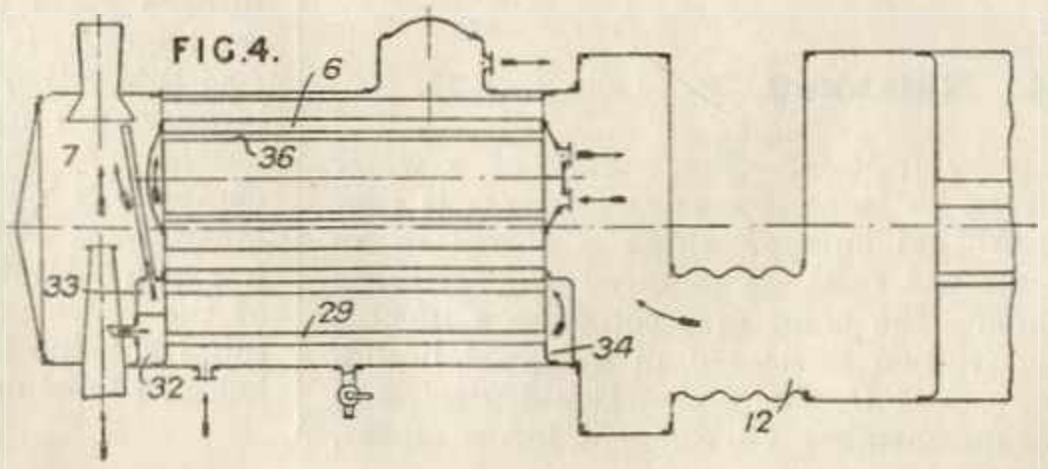


Feedwater, heating. — Reversing the flow through heaters, more particularly in connection with locomotive boilers, is effected by providing double-seated valves *a*, *b*, which may be interconnected, in the feed-pipe, one *a* in the pipe between pump and heater V and the other *b* between feed-water and boiler. In the figure the valves are shown as co-axial and movable in the same direction on a connecting rod operated by a steam cylinder D. With the valves in the position shown the flow is down the branch 1 and up the branch 2 to the heater and to the outflow K. When moved over to the other seats the flow is downward through the heater and up the branch 4 to the outlet. Modified arrangements of the piping are described, for manual or power operation of the valves and for valves with parallel axes.

260,019. Franco, A. June 24, 1925.

Feedwater, heating; heating water. — In a locomotive comprising one or more main steam generators and one or more auxiliary steam generators, the auxiliary generator has smoke tubes for the gases from the main generator, a second set of tubes heated by the exhaust steam from the engine, and a third set of tubes for heating

FIG.4.



train water. The gases from the main boiler 4 pass to the smoke-tubes of the auxiliary boilers 4 to smoke-boxes 7, 9. The exhaust steam passes through boxes 32, 34, 33 and tubes 29, Fig. 4, of the auxiliary boilers. The feedwater is drawn from tanks 41, Fig. 10, on the units A, C by a pump 56 and forced through check valves 59 to the auxiliary boilers which are connected to the main boiler by pipes 60 on which check valves 61 may or may not be fitted. The auxiliary boilers may be connected to each other by a common blow-off pipe 63 fitted with a valve 64. The auxiliary boilers may be arranged entirely below the level of the fire-box crown of the main boilers so that the former are always full of water, communication between the main and auxiliary boilers being effected by pipes connected with the main boiler above and below the water level. A set of tubes 36, Figs. 4 and 5, may be provided in the auxiliary boilers for heating water for the train, water being drawn from the tanks 41 by a pump 42 and forced through the tubes 36 to train pipes and a return pipe 46. Valves 48 - - 53 are provided to regulate the flow through the train pipes or cut it off altogether.

FIG. 5.

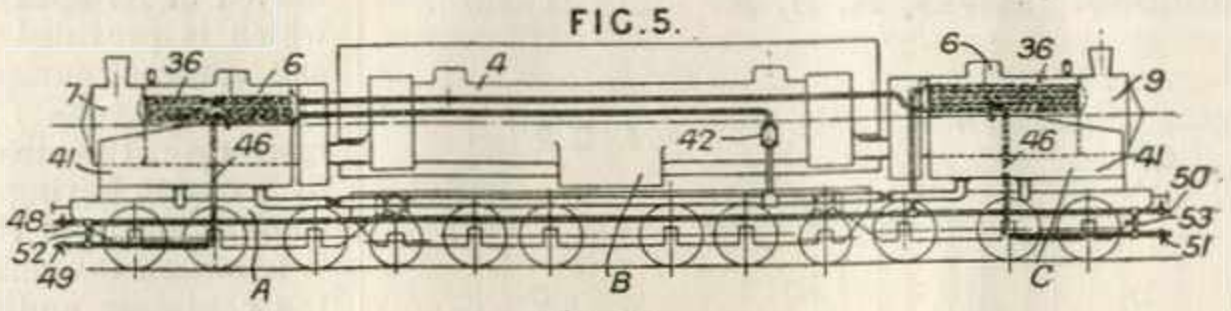
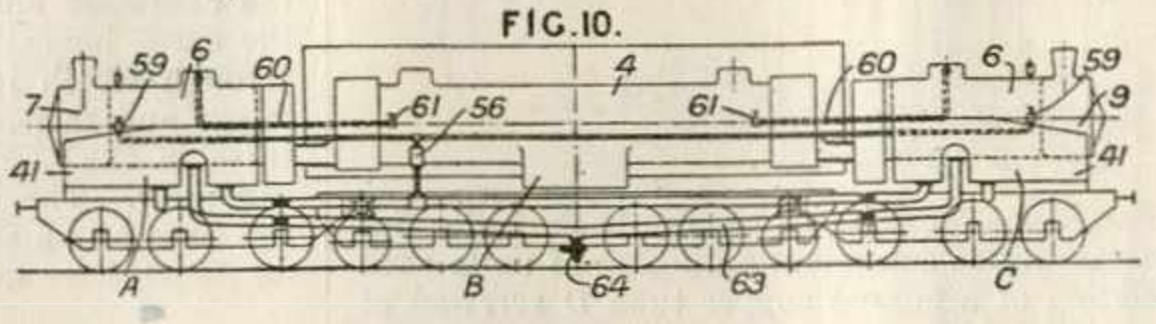


FIG. 10.



260,083. Leek, A. E. March 30, 1926.

FIG. 1.

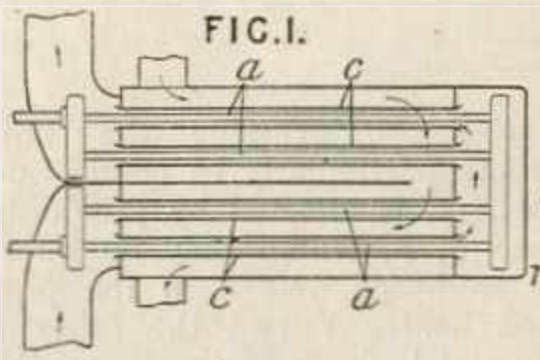
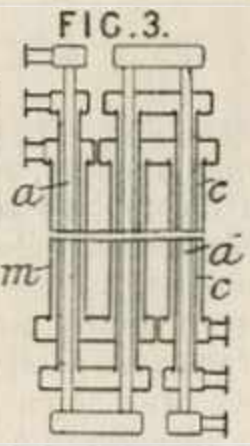


FIG. 3.

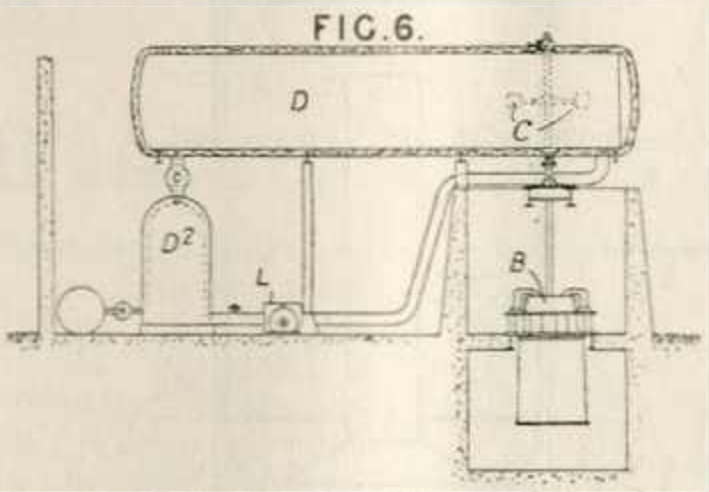


Feedwater, heating. — In combined air and water heaters for steam boiler plants, the waste gases pass through annular spaces between concentric tubes *a*, *c*, water passing through the tubes *a* and air outside the tubes *c* both media travelling back and forth one or more times through the heater. In the modification, Fig. 3, the air passages are enclosed in further concentric tubes *m*.

260,094. Shishkoff, P. Oct. 8, 1925.

Heating by friction.—The energy of a water motor driven by tides, waves or currents is converted into heat energy, which is stored in an accumulator and used, as required, for driving a heat engine. The plant may comprise a turbine B driving friction devices *c* in a lagged liquid-containing vessel D, the heated liquid passing to an expansion chamber D^2 where it forms steam, a pump L being provided for returning liquid from the chamber D^2 to the vessel D. The friction devices may be disposed in a friction boiler connected to storage vessels.

FIG. 6.



260,174. Babcock & Wilcox, Ltd., and **Boerstra, J.** May 10, 1926.

Heating air.—A tubular air heater, in which air passing though the annular spaces between outer and inner tubes E, A, is heated by waste furnace gases which may pass on both sides of the annulus, is provided with regulating dampers I so that either the inner tubes only, or both the inner and outer tubes simultaneously may be heated. In the modification, Fig. 4, additional dampers N control the access of gases to the inner tubes which are provided with flared ends L expanded into the tube plate C the diameter of the outer ends being such as to permit the tubes E being inserted or withdrawn through the holes in the tube plate.

(*For Figures see next page.*)

260,174.

FIG. 1.

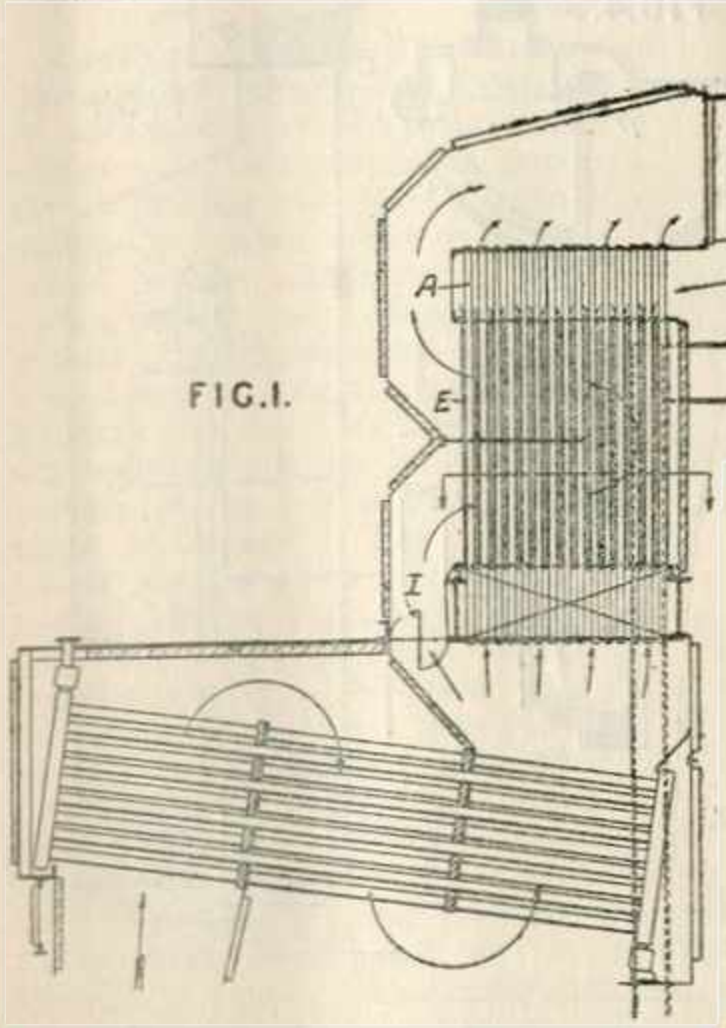
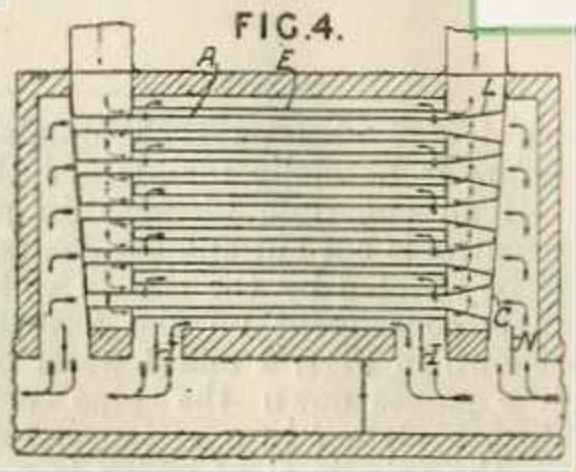
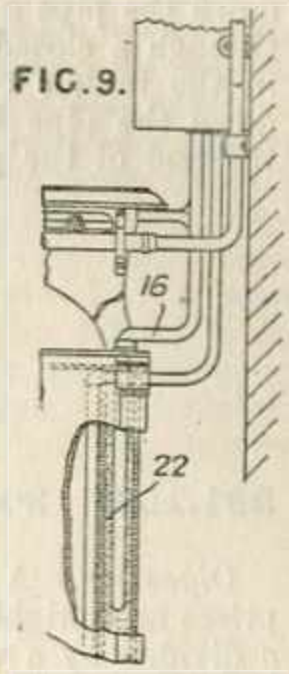


FIG. 4.



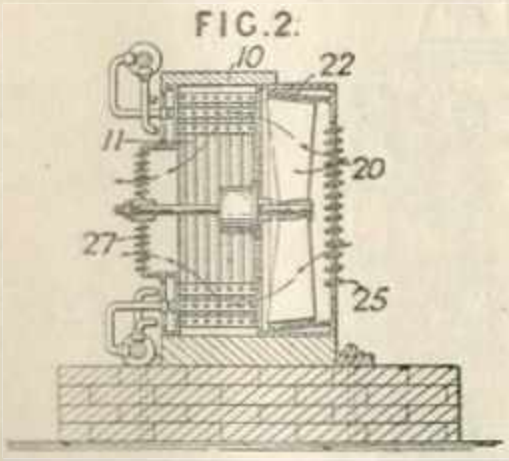
Water-tube boilers.—In gas rings and stoves having a water-heating duct arranged in proximity to, and conforming in shape with, the burner or burners, the heating portion of the duct is entirely cast integral with the burner. Fig. 2 shows a gas ring with an integral water duct 5 above the gas passage, and of a larger radius. The water duct may be disposed towards the inner periphery of the gas passage, or may be arranged concentrically between two rows of gas jets. Figs. 6 and 7 show a straight oven burner with an integral water duct consisting of parallel pipes 9, 10 connected at one end. The water duct may form two or more complete turns or lengths, around or along the burner, and in a modification may be in the form of a jacket completely or nearly completely surrounding the burner pipe. In the case of a gas oven, the supply pipes 16 leading from the water tank to the hot-plate burners may, as shown in Fig. 9, be formed with depending loops which pass down into the lagging 22 of the oven casing; the return pipes may be similarly arranged. The burners may each have a separate water circuit, or a number may be connected in series, and the water tank may be attached exteriorly or interiorly to, or be formed with, the back and sides of the oven.

FIG. 9.



260,357. Potts, J. Forgan-. July 30, 1925.

FIG. 2.



Heating gases.—A casing 10 contains a bank 11 of circularly-bent tubes disposed in a cylindrical formation, a propeller-type fan 20, a conical casing 22 about the axis of the fan to receive the air delivered therethrough and heat-transmitting vanes (not shown) secured on the tubes and angularly disposed so as to present edges only to the substantially spiral air-flow through the casing. Shutters 25, 27 may control the air flow.

260,692. Singleton, C. E. Aug. 12, 1925.

FIG. 7.

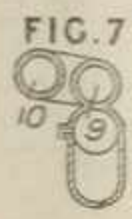


FIG. 2.

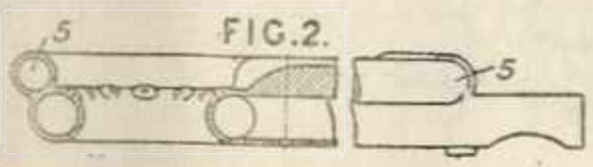
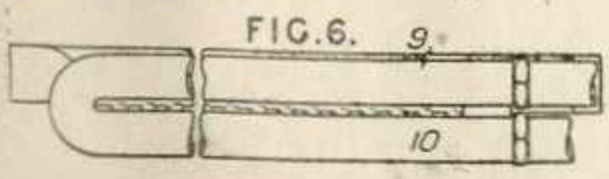
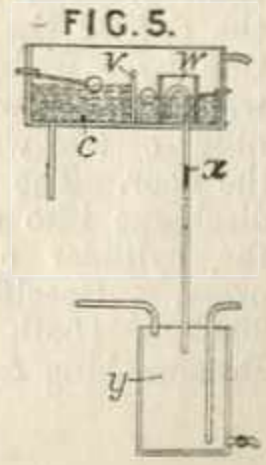


FIG. 6.



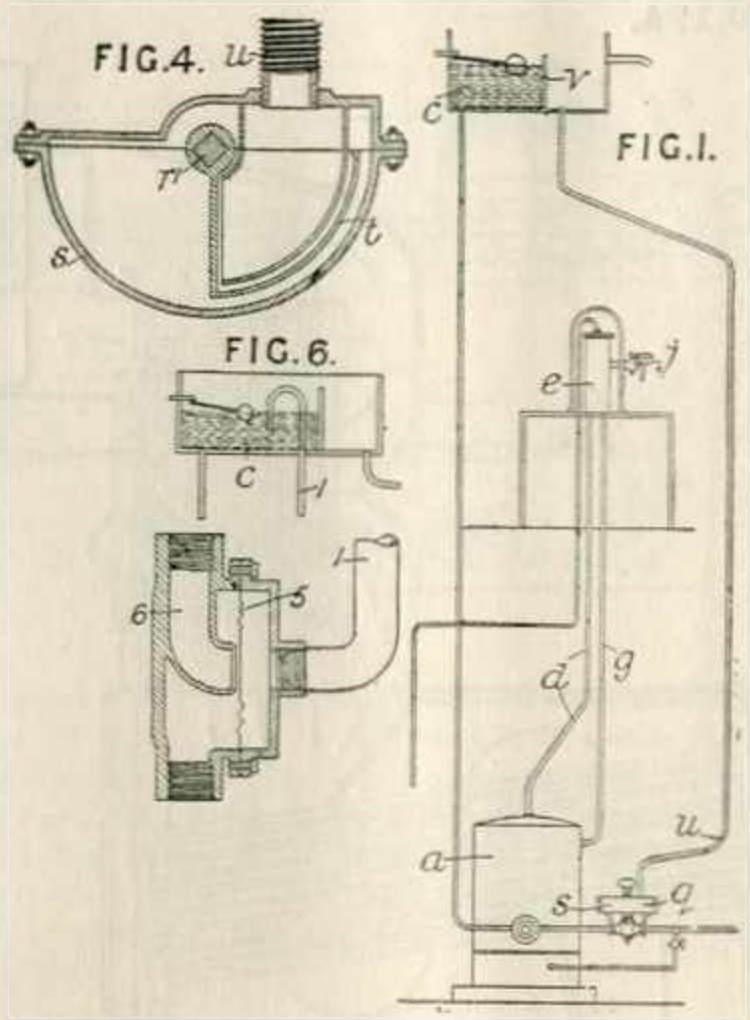
260,753. Marsh, R. G. Oct. 16, 1925.

FIG. 5.



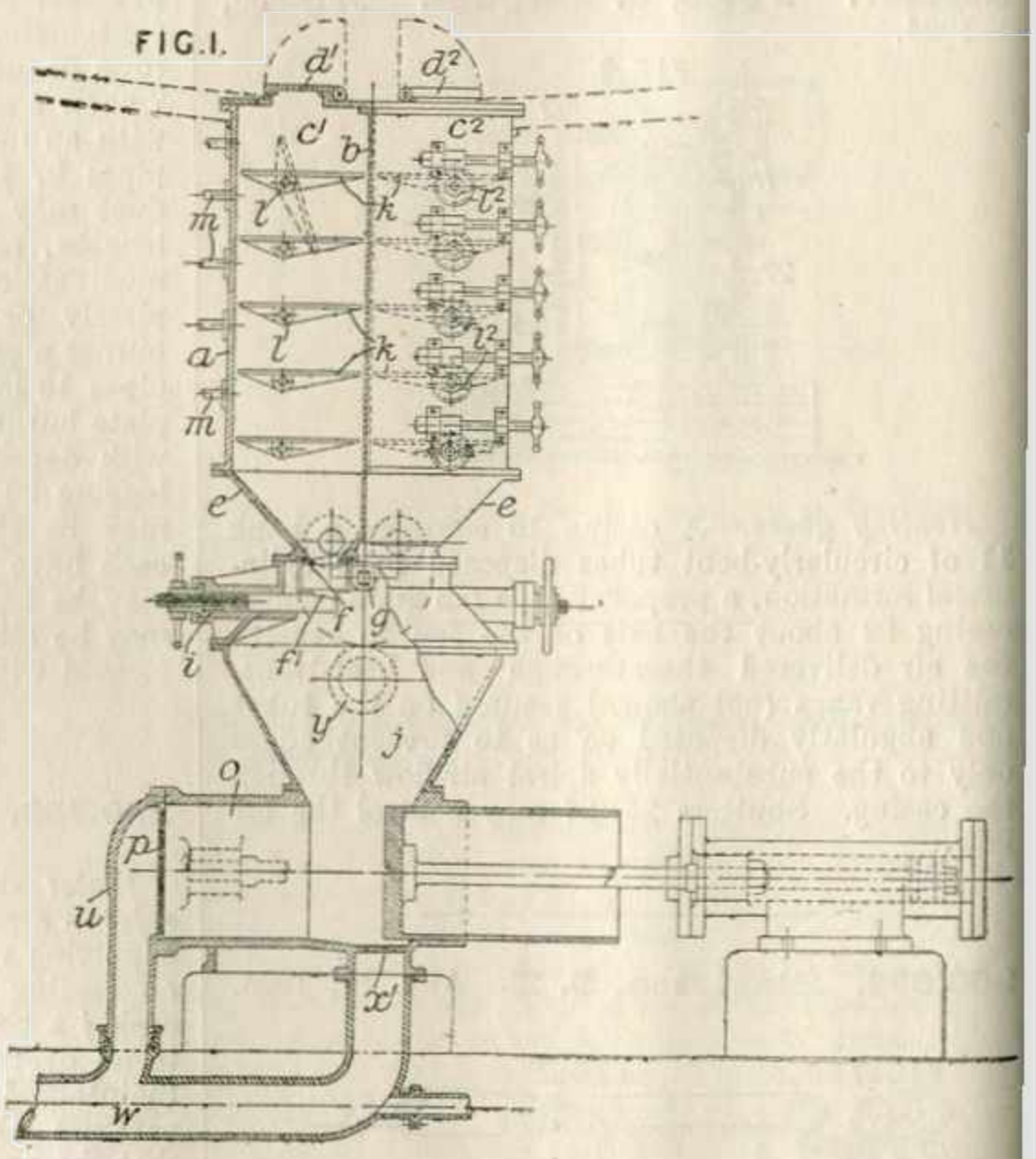
Water supply and delivery; safety - arrangements. — For supplying water that will boil on issuing from the delivery cock *j* a boiler *a* is connected to an overhead tank *c* and is maintained at such a temperature above boiling point that the pressure prevents the formation of steam. The delivery cocks are arranged upon standards or fountains *e* connected with the boiler by flow and return pipes *d*, *g*. An automatic air release

valve is provided on each standard. The temperature is normally maintained thermostatically but if an abnormal increase in pressure occurs the control is cut out and the gas is shut off. This may be effected by the rise in water level in the tank *c* consequent on the formation of steam. As shown in Figs. 1 and 4 water overflowing the weir *v* passes down the pipe *u* and, striking against a plate *t* in a casing *s*, turns off the gas cock, the spindle r^1 of which is connected to the plate *t*. In the example shown in Fig. 5 overflowing water fills the chamber *w* and then siphons down the pipe *x* to cut off the gas supply passing through a closed chamber *y*. In Fig. 6 a siphon in the tank *c* operates to cause water passing down the pipe 1 to press a diaphragm 5 against the end of the gas supply pipe 6.



261,102. Phillips, E. B., West, W., and **Parr, W. S.** Aug. 14, 1925.

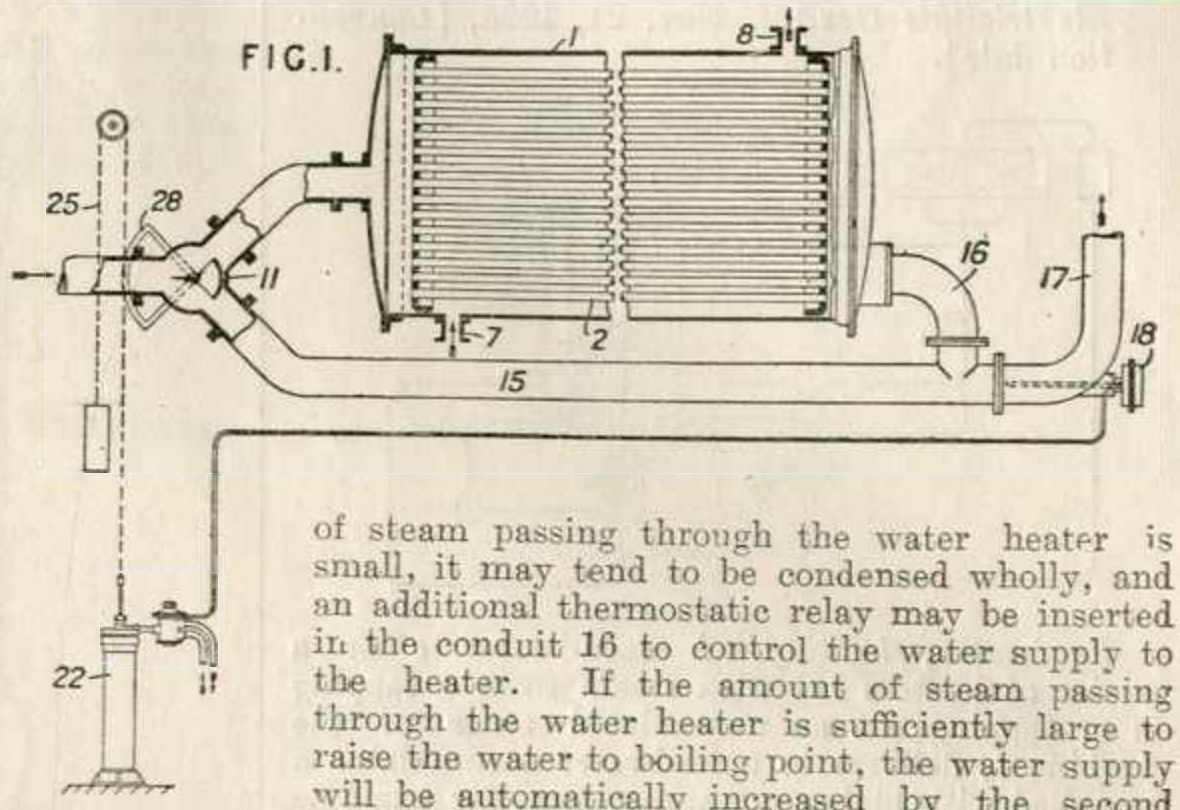
Digesters.—A steam cooker comprises an upright cylindrical vessel *a* divided by a vertical partition *b* into two compartments c^1, c^2, each compartment containing a number of superposed trays *k*. Each tray is carried on a spindle *l* near one end, each spindle projecting through a stuffing box and being provided with a worm wheel l^2 actuated by a worm on a hand operated shaft. Offal is passed in through doors d^1, d^2, and for charging all the trays except the bottom are tilted to a vertical position; after the bottom tray has been filled, the next is lowered and and filled and so on. Steam is admitted above each tray by pipes *m*. The cooker has a conical bottom *e* provided with discharge apertures for each compartment adapted to be closed alternately by a flap door *f* actuated by a shaft *g*. The door is clamped in the one or the other closed position by a wedge at the end of a travelling screw *i* engaging one or other of two wedge surfaces f^1 on the door. The two compartments discharge into a hopper *j* feeding the cylinder *o* of an hydraulic press. Specifications 103,493, 238,720, [both in *Class* 28 (i), Breadmaking &c.]; and 247,437 are referred to.



261,196. British Arca Regulators, Ltd., and **Lindsay, T.** Dec. 1, 1925.

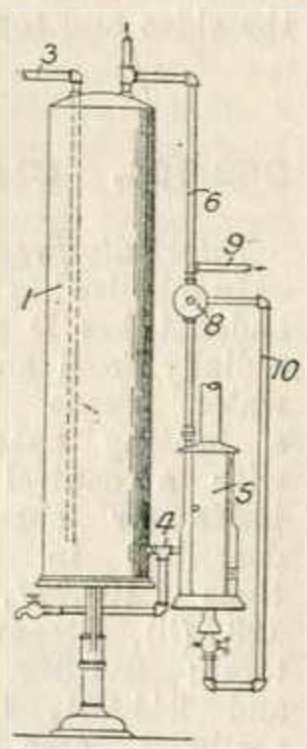
Heating liquids.—The temperature of superheated steam is controlled by dividing the steam into two controlled portions, passing one through an indirectly heated water or other liquid heater, and mixing the cooled steam with the other portion, the temperature of the mixed steam actuating a thermostatic device which controls the valve which regulates the volume of the two divided portions of steam. The water heater comprises a cylinder 1 having inlet and outlet 7, 8 for the water, and provided with heating tubes 2. The steam inlet valve 11 controls the proportions of steam passing through the heater 1, and direct through pipe 15 to the outlet 17. The valve 11 is actuated by a quadrant 28, chain 25, and pressure cylinder 22, the latter being controlled by a thermostat 18 through a relay. The thermostat and relay are as described in Specification 206,154, [*Class* 64 (ii), Heating systems &c.]. If the amount of steam passing through the water heater is small, it may tend to be condensed wholly, and an additional thermostatic relay may be inserted in the conduit 16 to control the water supply to the heater. If the amount of steam passing through the water heater is sufficiently large to raise the water to boiling point, the water supply will be automatically increased by the second thermostat. The steam generated in the water heater may be conducted to the mixing point, and any condensed steam may pass through a steam trap to the feed water tank. Specification 116,074, [*Class* 135, Valves &c.], is also referred to.

FIG. 1.



261,331. Spencer Thermostat Co., (Assignees of *Spencer, J. A.*). Nov. 13, 1925, [*Convention date*].

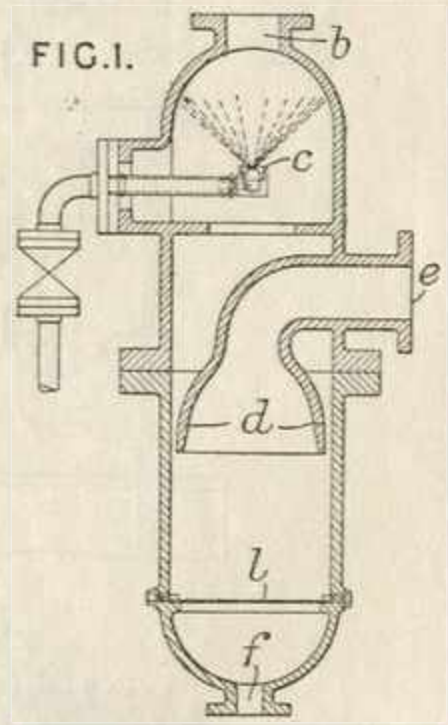
Heating water.—In a hot water supply system embodying a heater connected by supply and return pipes to a reservoir, a thermostat controlling the heater is arranged in the pipe circuit between the heater and the top of the reservoir. The hot water tank 1 is provided with cold water inlet 3, and with circulating pipes 4, 6 connected in the usual manner to the heater 5. A thermostat 8, which may be of the type described in Specification 261,332, [*Class* 64 (ii), Heating systems &c.], is arranged in the pipe 6, and is adapted to control the fuel valve of the heater located in the supply pipe 9, 10. The thermostat is arranged so that there is a time lag in following the temperature in the pipe 6, e.g., so that the tank 1 becomes one third full of hot water before the heating is cut off. The thermostat turns on the fuel supply when the level of cold water rises sufficiently to reach it.



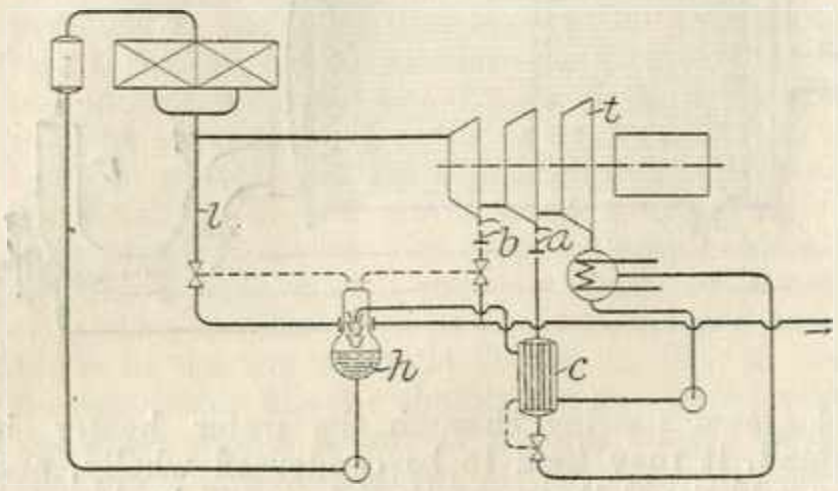
261,514. Fothergill, H. Sept. 28, 1925.

Feedwater, heating.—The superheat is removed from steam prior to passing it into a surface condenser or feedwater heater. Superheated steam entering by an inlet *b* is sprayed with water from a nozzle *c* and leaves by an outlet *e* having a funnel-shaped extension *d* directed towards the water outlet *f*. A perforated plate *l* may be placed across the chamber between the funnel *d* and the outlet *f*. The nozzle *c* may be supplied with water from the discharge side of the boiler feed pump, and the water from the outlet *f* may be passed into the drainage chamber of the feedwater heater.

FIG. 1.



261,791. International General Electric Co., Inc., (Assignees of *Allgemeine Elektricitäts Ges.*). Nov. 21, 1925, [*Convention date*].



Feedwater, heating.—A feed-heater *c* or a series of heaters fed with steam from a tapping *a* or tappings on an unregulated stage of the turbine *t*, delivers to a feedwater accumulator *h* supplied with higher pressure steam, for example from a higher tapping *b* and a live-steam connection *l* the steam being regulated to keep the pressure and temperature in the accumulator *h* constant under varying loads.

262,660. Evensen, E. C. June 4, 1926.

FIG.1.

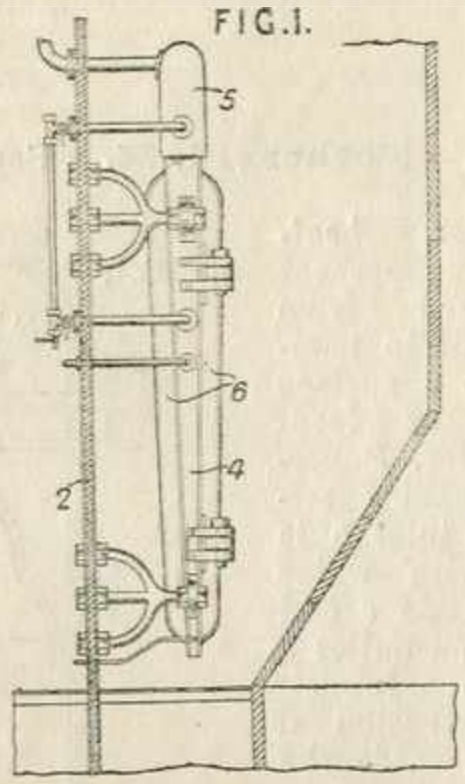
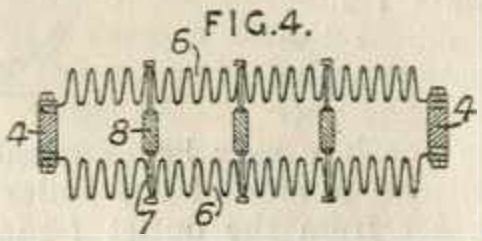


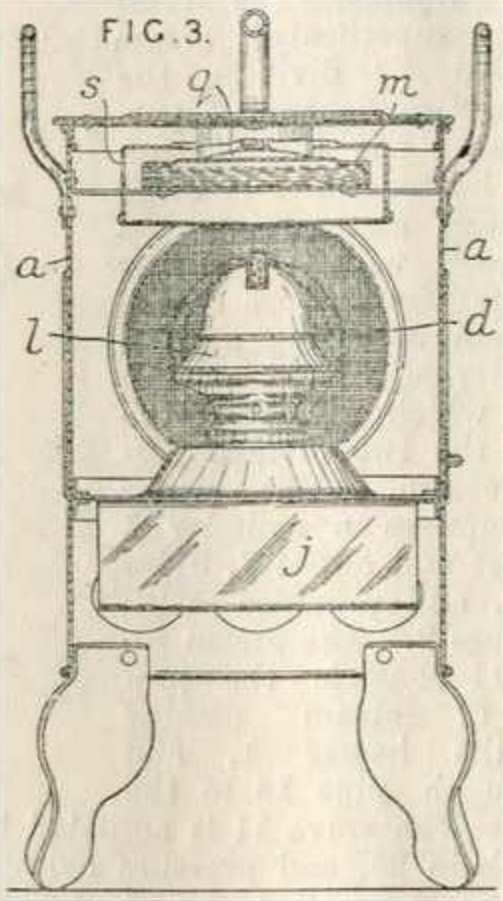
FIG.4.



Feedwater, heating.—A heater mounted in a flue on a hinged door 2 comprises a cast iron frame 4 having a steam hood 5 cast integral with it or detachably affixed. On both sides the frame is covered by corrugated sheet metal 6 fastened along the edges and also intermediately by means of bolts 7 secured to longitudinal ribs 8 parallel with the side walls of the frame.

262,661. Powell & Hanmer, Ltd., and **Cook, A. J.** June 10, 1926.

FIG.3.

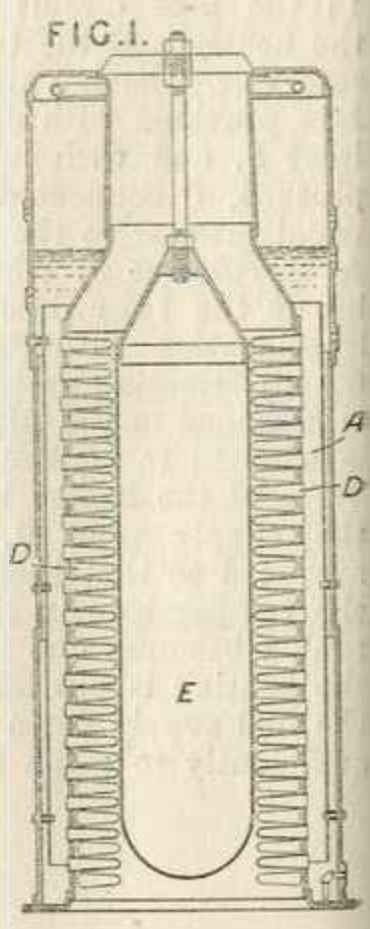


Portable water-heaters.—A heater for warming the cooling water of motor cars to prevent freezing &c. comprises a casing *a* containing a flat tank *m* of shallow depth partially enclosed by a sheet-metal baffle *s* spaced away from the tank and serving to direct hot gases from the lamp *l* below the tank around the sides and upper surface of the tank. The oil reservoir *j* is preferably directly exposed to the atmosphere. The overflow from the tank may be taken from a domed boss *q*. The openings *d* in the casing at the sides and top are gauze-covered.

262,864. Clarkson, T. Sept. 17, 1925.

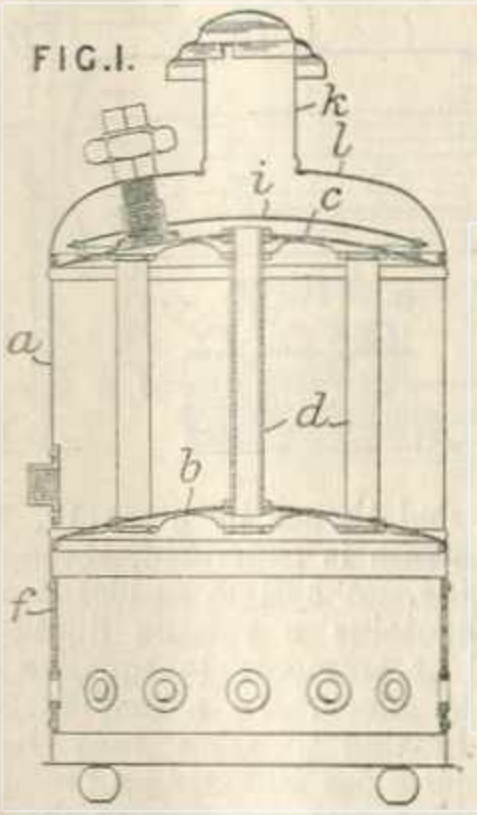
Internally-fired boilers.—In a boiler having closed-ended tubes D projecting radially from an annular water space A into a heating space fitted with a central tubular baffle or core E as described in Specifications 108,177, [*Class* 123 (ii), Steam generators]; 211,342, 244,930 and 244,931, the cross sectional area of the annular space through which the hot gases pass over the tubes is less towards the outflow end than towards the inflow end in order to equalize the rate of flow of the gases over the tubes. The number of tubes in the lower rows may be less than the number of tubes in the upper rows. Alter-

FIG.1.



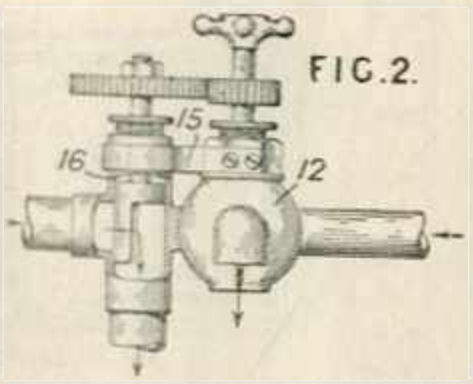
natively, or at the same time, the dimensions of some or all of the tubes in the lower rows may be less than the dimensions of the tubes in the upper rows. The walls of the baffle or of the water space may be so inclined relatively to one another as to give the desired restriction of the heating space. The boiler may be heated by waste gases.

263,401. Taylor, A. G., and **Stubbing, H.** June 4, 1926.

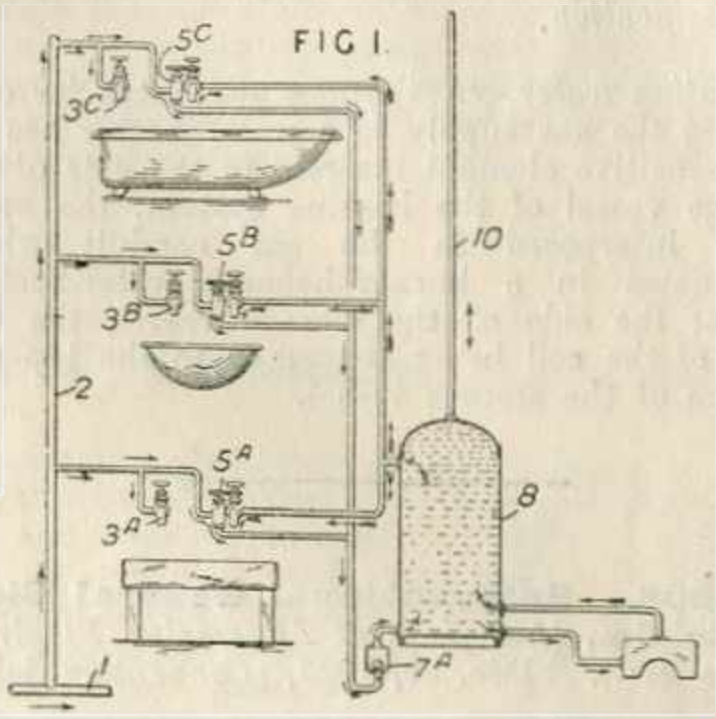


Block-form boilers.—A liquid heater comprises a casing *a* with upper and lower convex and concave walls *c*, *b* connected by tubes *d*, a baffle *i* conforming to the shape of the uper wall, a stand *f* within which the heating means is located and a removable cover *l* mounted on the upper part of the casing with a centre flue outlet *k*.

263,513. Thomas, D. J., and **Thomas, J.** April 30, 1926.

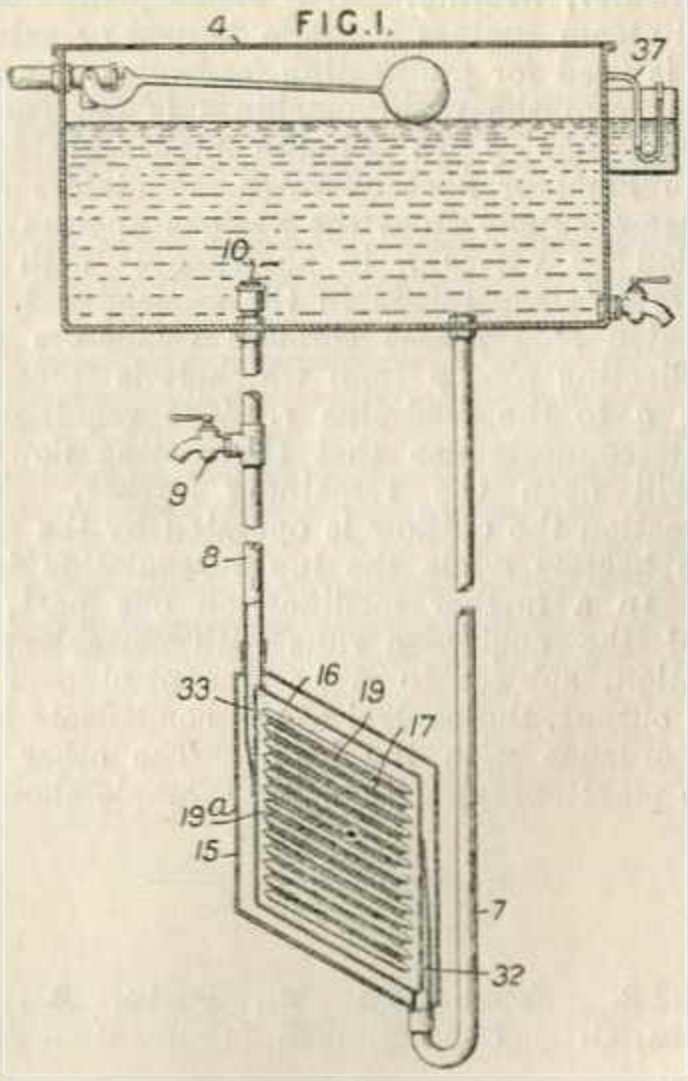


Water supply and delivery.—In a water supply system, in which supply from the main is controlled by consumption by means of a two-way rotary plug valve and co-operating tap having spaced stems connected by toothed gearing, the body 16 of the valve and the body 12 of the tap form separate units: means such as a clip 15 connect the bodies 12, 16. The main 1 is connected directly to cold taps 3A, 3B, 3C, and is connected to the hot water storage cylinder 8 through combined valves and taps at 5A, 5B, 5C. A non-return valve 7A prevents



syphoning, and an escape header 10 is provided on the cylinder 8. Pressure reducing valves may be provided in the feeder 2.

263,664. Woodgate, H. W., and **Slade, F. W.** April 13, 1926.



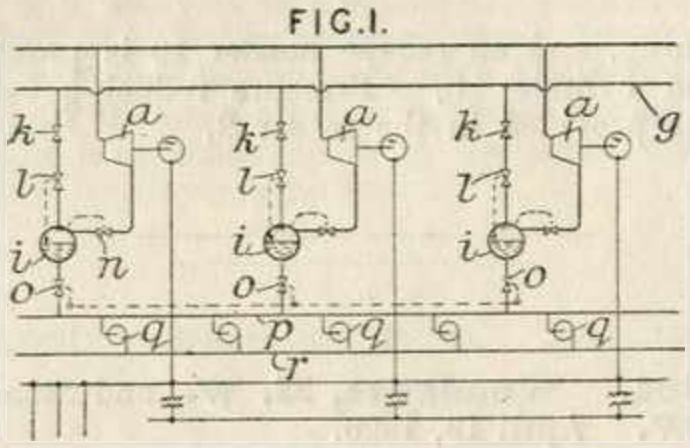
Heating water.—An electric water heater 16 is coupled to a cistern 4 fitted with a ball float valve and a water cooled vapour seal 37. The pipe 8 is fitted with a non-return valve 10 and a hot water tap 9.

263,734. Bastian-Morley Co., (Assignees of *Lonergan, S. J., and Eaton, H. D.*). Jan. 2, 1926, [*Convention date*]. *Drawings to Specification.*

Heating water.—A thermostatic valve for controlling the gas supply to a water heater has its heat-sensitive element inserted in the side of the storage vessel of the heating system, the valve being interposed in the gas conduit which terminates in a burner below a water-heating coil at the side of the storage vessel, the two ends of the coil being connected to the top and bottom of the storage vessel.

263,808. International General Electric Co., (Assignees of *Allgemeine Elektricitäts-Ges.*). Dec. 29, 1925, [*Convention date*].

FIG.1.

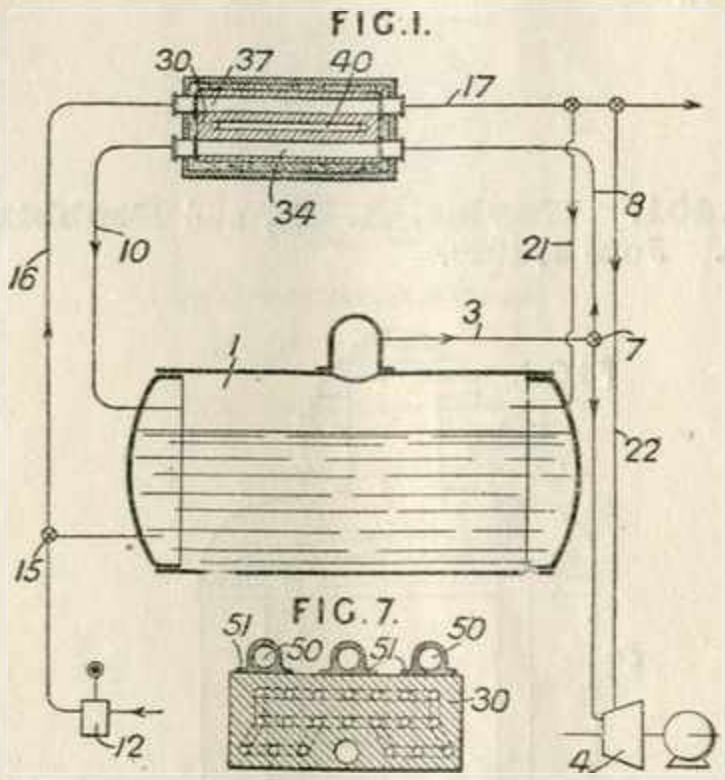


Feedwater, heating.—In a steam-plant having several steam engines *a* whose tapped or exhaust steam is used for pre-heating feedwater, the condensate from the main machines is fed from a common pipe *g* to direct-contact heaters *i* through hand or float operated regulators *k*, *l*. The steam supply from the various engines *a* is regulated by valves *n* in accordance with the pressure or temperature in the associated heater *i*. Heated feed passes through regulators *o* to the collecting pipe *p* from which it is forced by pumps *q* to the feed-pipe *r*. The regulators *o* are interconnected so that the closing down of one will open the remainder further. In a modification the outflow is operated by the floats in the heaters while the input regulation is by hand. In a further modification one part, say one of the engines *a* runs with normal speed-regulation, subject to a hand control over the power output, the control of the condensate being in accordance with the load. The other part of the plant operates as in the example shown.

263,818. Popescu, T., Pais, A., and **Pais, C.** Dec. 23, 1925, [*Convention date*].

Feedwater, heating.—Excess of steam produced in a boiler is passed through a solid conducting mass, in which the heat is stored, and from which it may be supplied for heating feedwater or otherwise. The temperature in the solid mass is equalized by means of a system of closed passages containing a volatile liquid. Steam passes from a boiler 1 through a pipe 3 and valve 7 to an engine 4, any excess being passed through a pipe 8 to a passage 34 in a heat-insulated metal block 30, which is connected by a pipe 10 to the boiler. Feedwater is supplied by a pump 12 through valve 15 and pipe 16 to passages 37 in

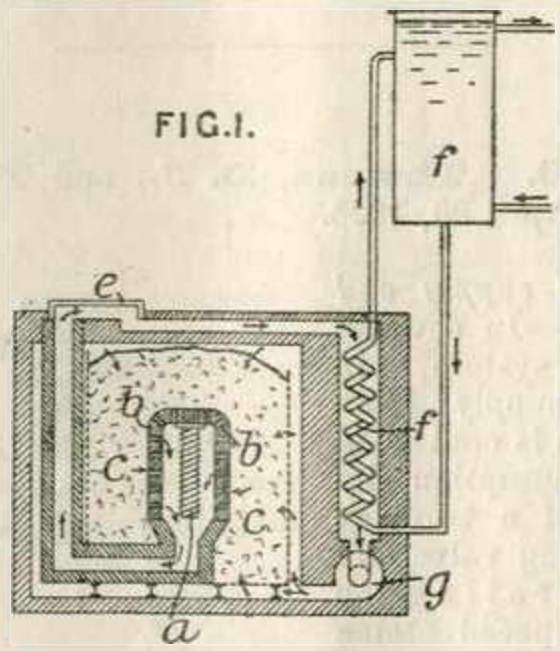
FIG.1.



the block 30, and thence by pipes 17, 21 to the boiler, or, if steam is generated, through a pipe 22 to the engine. A system of closed connected passages 40 contains a volatile liquid such as water, alcohol or ammonia to equalize the temperature of the block. In a modification, Fig. 7, the water heating passages may be in the form of external pipes 50 having a broad flat surface 51 in contact with one face of the block 30.

263,827. Seehaus, P. Dec. 24, 1925, [*Convention date*].

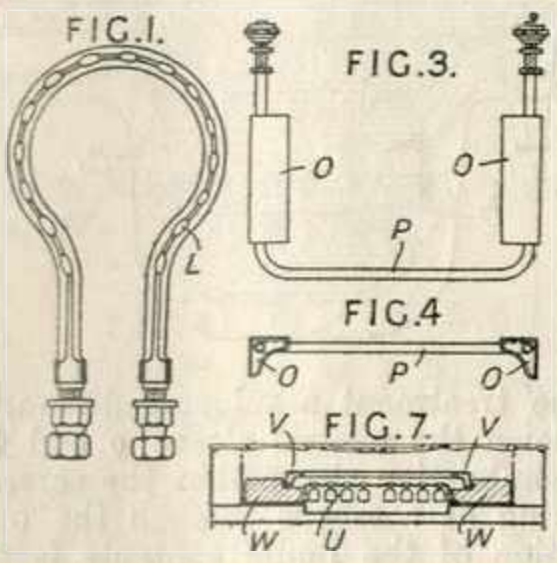
FIG.1.



Heating water.—In a device for storing and utilizing electrically generated heat, the heat is transmitted to the consuming device by a circulating liquid or gas which passes inwards through a porous insulating covering serving in

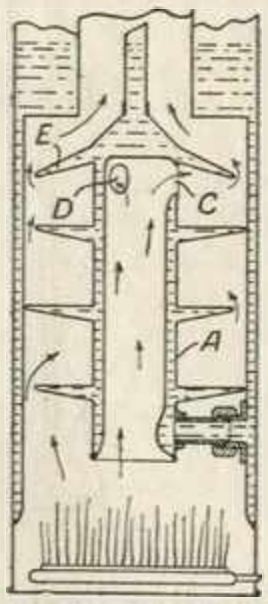
part for the storage of heat. Heat from an electric heater *a* is stored in part by a relatively small storage mass *b* and in part by an insulating covering *c* of superposed plates, sand, or other porous medium. The heat-transmitting medium is circulated by a pump *g* inwards through the medium *c* and core *b*, and thence in contact with a cooking plate *e* and water heater *f*. The circulation of the medium is regulated by dampers or by the speed of the pump *g*. The insulating covering *c* may be subdivided into superposed coverings having independent means for circulating fluid through them. The inner device may be used for generating steam, and the next for heating feed water. If air is used as the circulating medium, it may be allowed to escape when it has given up heat.

264,200. Carnegie, J. C. June 4, 1926.



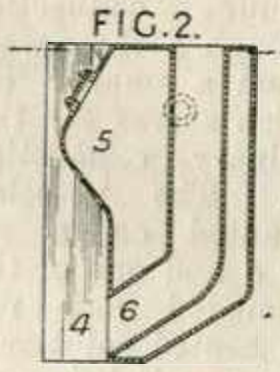
Water-tube boilers.—A water-heating element for gas stoves, of the kind comprising a chamber of downwardly-converging cross section arranged in proximity to a burner, is made in the form of an open **U** or horse-shoe form loop of either diamond or approximately inverted **L** shape in section. The form shown in Fig. 1 comprises a looped tube of diamond cross section and provided with corrugations L. Figs. 3 and 4 show a form for use in a gas oven, comprising chambers O of inverted **L** section which are arranged above the burners and are connected by a pipe P. Fig. 7 shows a water-chamber V of loop form and inverted **L** section, partly embedded in the firebrick W surrounding the multiple-jet burner U of a hot-plate cooking stove.

264,610. Jackson Boilers, Ltd., and **Newby, H. R.** Nov. 3, 1925.



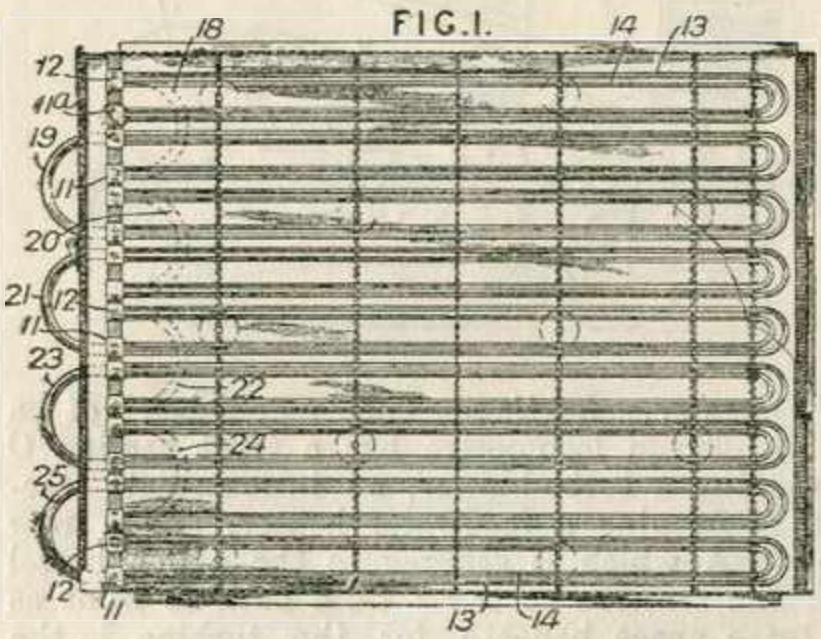
Internally-fired boilers. — In a water-heater having an internal chamber A, within the main casing, furnished with a flue delivering through side-holes C, D under a hollow top plate E, a number of hollow plates such as E are disposed along the length of the chamber. Specification 9191/03 is referred to in the Provisional Specification.

264,734. Johnston, P. July 14, 1926.



Block-form boilers. — A hot-water boiler forming the back and sides of an open grate is provided with a bulged front 5 extending between side wings 4 and an integral flue passage 6 which may pass upwardly as shown or straight through to the back of the boiler. The rear of the boiler may be similarly bulged.

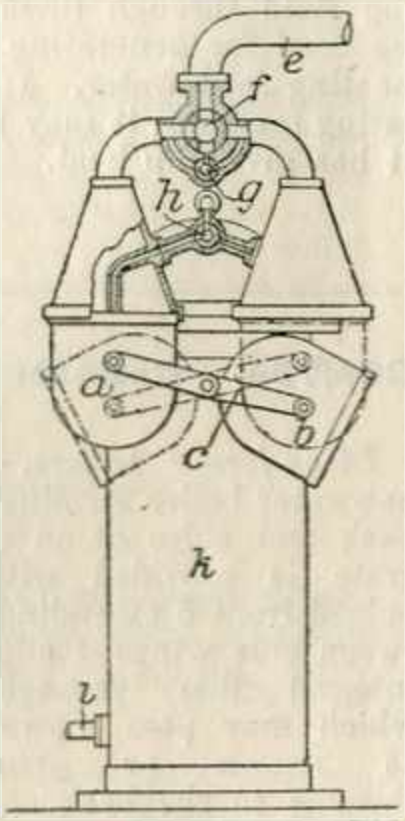
264,746. Babcock & Wilcox, Ltd., (*Babcock & Wilcox Co.*). Aug. 16, 1926.



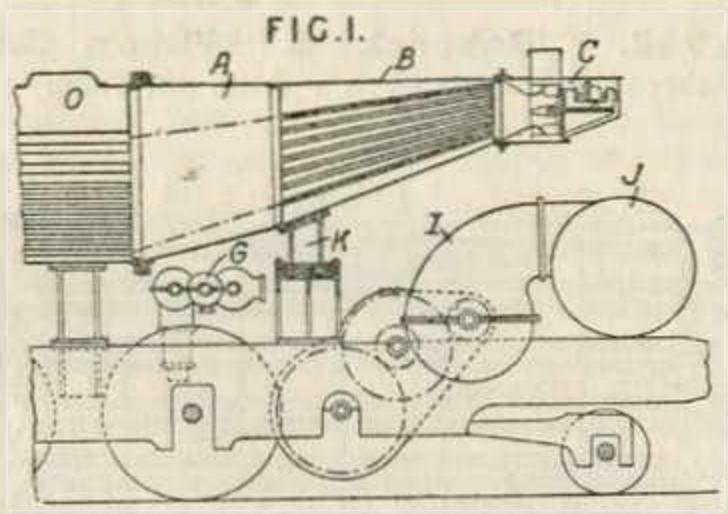
Feedwater, heating.—In a fluid-heater of the economizer type having a plurality of headers 11, 12 extending across the flue at one side and one above the other, and **U**-tubes 13, 14 connecting each pair of adjacent headers, the fluid inlet 11^a is fitted into the header next below the topmost header and the outlet to the header next above the lowermost, and connections 18 - - 25 are arranged between the headers to connect the lower one of each pair with the upper one of the next upper adjacent pair of headers. The **U**-tubes are constructed of different sizes 13, 14 and may be tapered in towards the looped end, so as to be more of **V**-formation.

265,127. Berten & Co., Ges. Feb. 1, 1926, [*Convention date*].

Digesters. — In evaporating sugar or other solutions, the solution is heated by being passed from an inlet *i* through a worm contained in a steam chamber *k* and is discharged through a three-way cock *h* into one or other of the vessels *a*, *b*. The vessels are adapted to be connected to a vacuum connection *e* through a three-way cock *f* and a smaller cock *g* which serves for the preliminary exhaustion of air. The vessels are mounted on a rocking bar *c* and one of them is exhausted and receives the heated solution while the other is being emptied. Specification 227,344 is referred to.



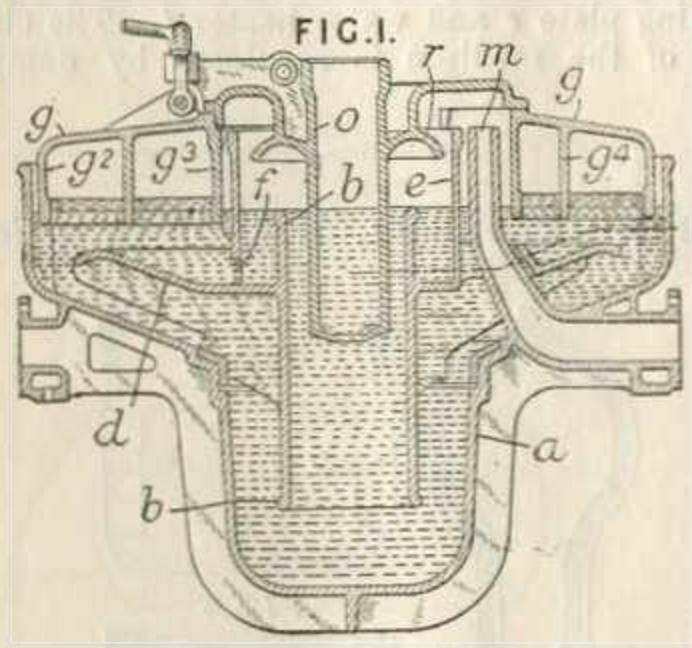
265,145. Schneider et Cie. Jan. 27, 1926, [*Convention date*].



Feedwater, heating.—The smoke-box of a turbine-driven locomotive has a front section C containing a turbo-blower, an intermediate section B forming a feedwater heater, and a rear section A which is secured to the boiler barrel O. The sections so taper from back to front as to leave space beneath for the turbine I, the condenser J, and the pumps G. The intermediate section contains smoke-tubes so arranged that the area covered by the prolongation of their axes to the boiler tube plate covers the ends of the boiler smoke-tubes.

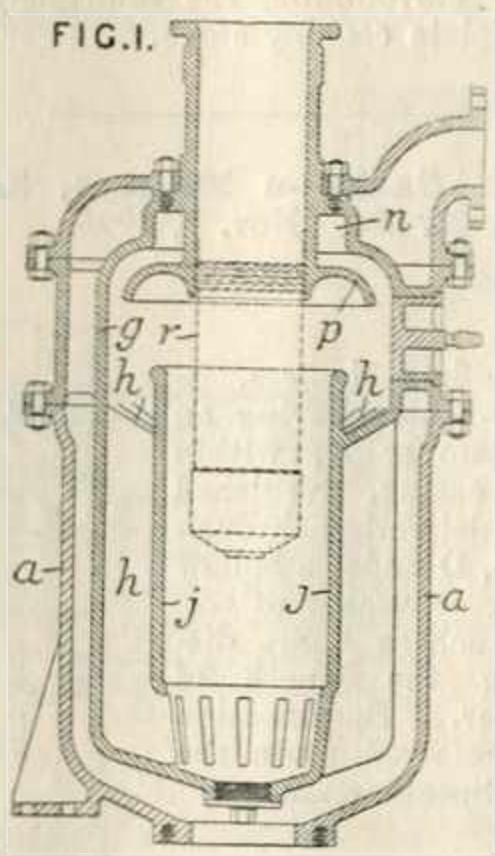
265,252. Hammond, C. F., and **Shackleton, W.** Sept. 5, 1925.

Heating liquids.—The material to be treated, for example strong caustic soda solutions, oils, or tar, is conducted over the surface of a hot liquid mass, for example lead, heated directly by the gases of a submerged-flame burner, the products of combustion being withdrawn at a portion of the surface which is not covered by the material under treatment. In the example of an apparatus shown in the figure, the hot liquid mass is contained in a vessel *a*, which may be heated at starting by an external furnace.



During the treatment a submerged-flame burner extends down the central sleeve *o* and the products of combustion rise within the screen *b* and after baffling at *r* escape through the outlet *m*. A circulation of the liquid contents is thus set up, the mass passing outwards through the ports *f* in the wall *e* and over and under the baffle *d*. The caustic soda solution or other material to be treated is caused to flow in a substantially circular path on the surface of the mass between depending walls g^2, g^3, g^4 carried by the cover *g*, suitable inlets and outlets being formed by tubes projecting from beneath the surface of the mass.

265,253. Hammond, C. F., and **Shackleton, W.** Sept. 5, 1925.



Heating liquids.—A method of heating liquids employs a submerged-flame burner *r* operating in

a liquid or molten mass contained in a chamber *g* in heat-conductive relation to liquid contained in a separate chamber *a*, the products of combustion rising from the burner within a screen *j* and escaping by a duct in communication with the upper part *n* of the chamber *g*, out of contact with the contents of the chamber *a*. The chamber *g* may be formed with ducts *h* round the screen *j* separated by spaces open to the liquid in the chamber *a*. A deflector *p* prevents the escaping products of combustion from carrying off particles of the mass in the chamber *g*. Lead is mentioned as a suitable medium for the chamber *g*.

265,254. Hammond, C. F., and **Shackleton, W.** Sept. 5, 1925.

FIG. 4.

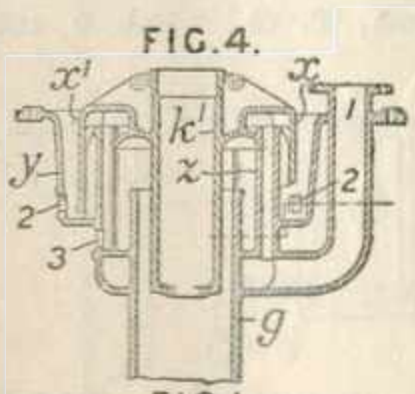


FIG. 6.

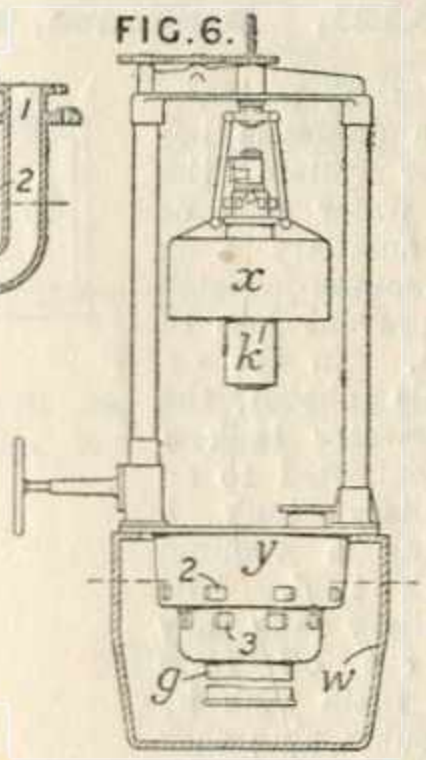
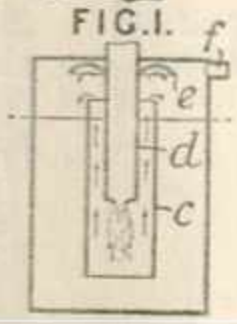


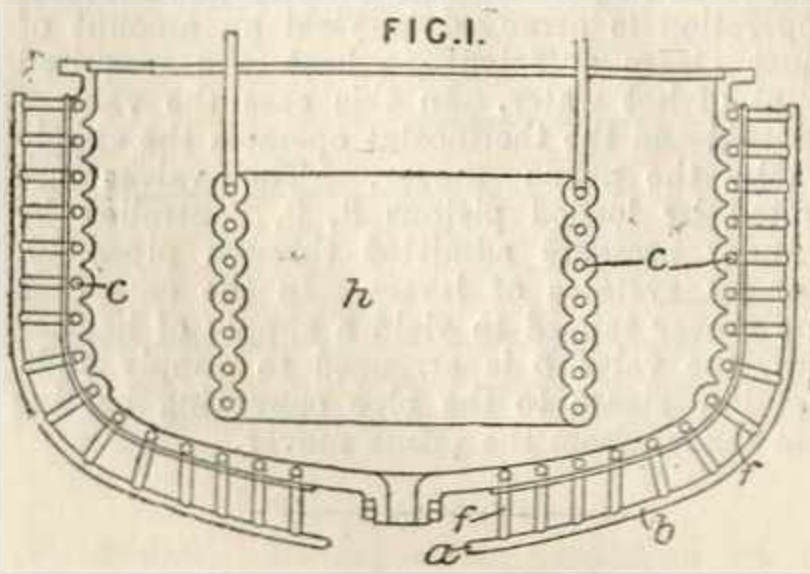
FIG. 1.



Heating liquids.—Water &c. is raised or circulated by means of a burner *d* submerged in the liquid inside a tube *c* so that the flame directly heats the liquid in the tube and the products of combustion lighten it and cause it to rise and overflow the top of the tube. A deflector plate *e* may be arranged on the burner to throw the ascending liquid downwards. The products of combustion escape by a pipe *f*. In another form the burner is vertically adjustable by means of screw and nut mechanism. In the apparatus shown in Figs. 4, 6, which may be used for circulating molten metal in a pot *w*, the burner is enclosed in a tube k^1 carried by a cover *x*, of which the skirts x^1 dips into an annular well *y* provided with ports 2 through which liquid may enter the well to form a liquid seal round the skirt. The well *y* carries a cylinder *g* dipping into the liquid in the pot and surrounding the tube k^1. The heated liquid, mixed with products of combustion, overflows the upper edge of the cylinder *g* and the liquid returns to the pot through ports 3 while the gases pass down conduits *z* to the vent pipe 1.

265,597. Hadamovsky, P. Feb. 5, 1926, [*Convention date*].

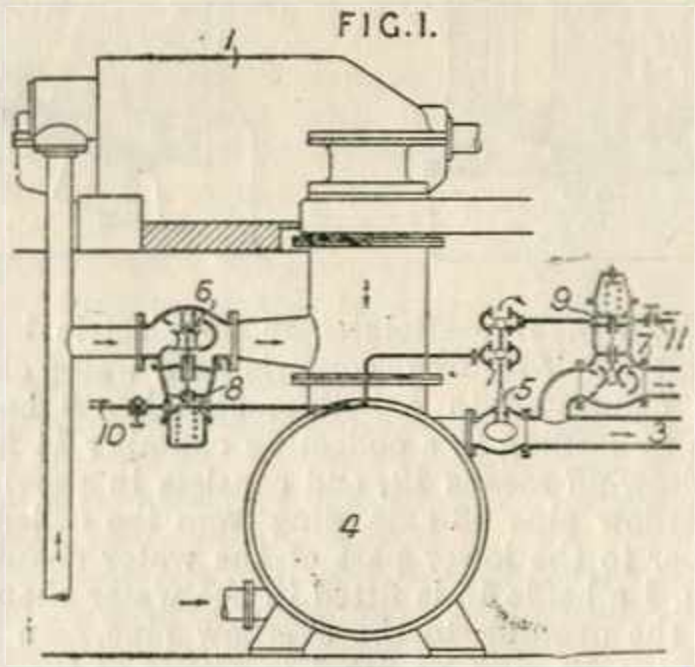
FIG. 1.



Boiling-pans and the like; heating water.—The wall surfaces of vessels, or of heating elements, having embedded therein pipes conveying steam or other heating medium are shaped preferably by waving or corrugating as shown, so that nearly all parts of the wall surface are equidistant from the pipes, whereby a better heat exchange and economy of material are effected and liability to corrosion is diminished. The pipes *c* may be of wrought iron embedded in cast iron walls. Steam may be admitted at *a* to a pipe *b* connected by branches *f* with the several pipes *c*, which have condensation outlet branches. The element *h* inside the pan may be similarly formed. The invention is applicable to pans used in evaporating, crystallizing and sublimating processes, and to flat or roller shaped elements.

265,629. Akt.-Ges. Brown, Boveri, et Cie. Feb. 5, 1926, [*Convention date*].

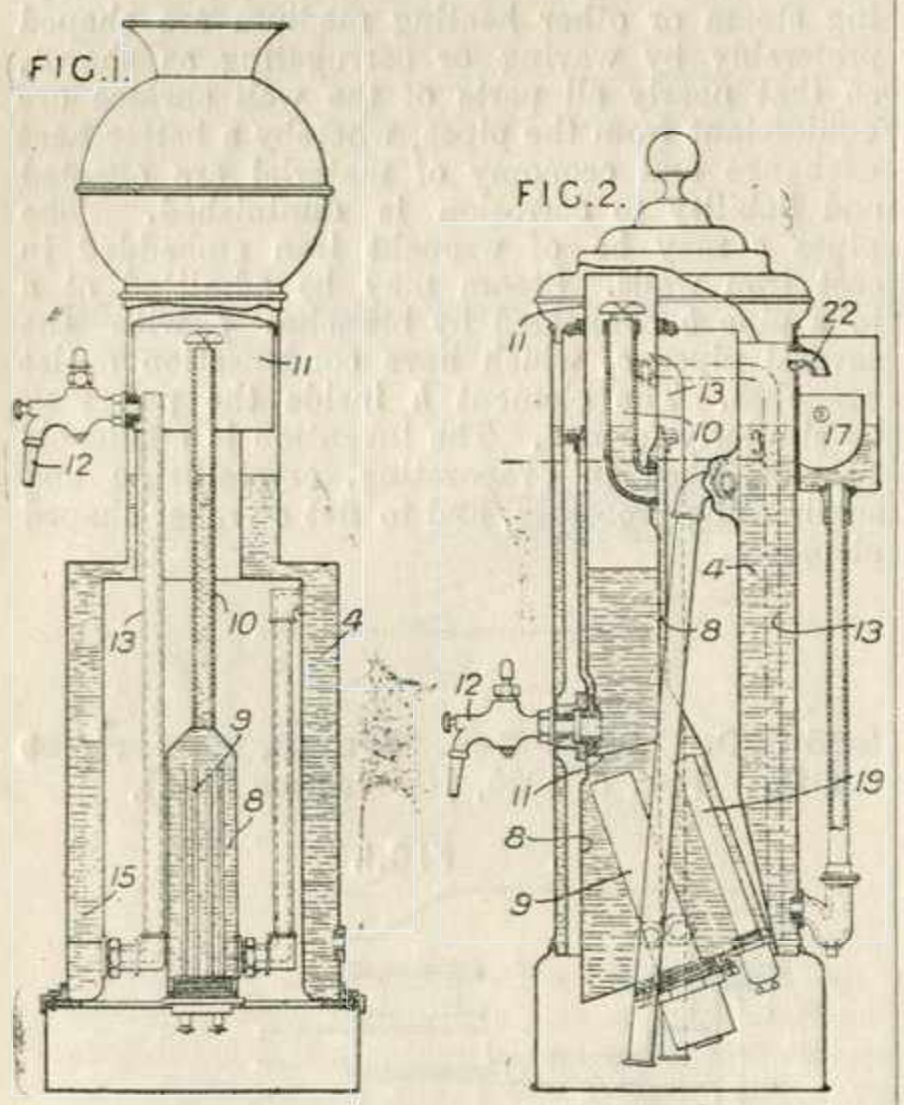
FIG. 1.



Heating water.—In industrial power plants required to yield large quantities of hot water, the water which flows through a condenser 4 receiving exhaust steam from a prime mover 1 is used as the supply of hot water. A thermostat 5 in the outflow pipe 3 is adapted, when the temperature is too low, to open a valve 6 admitting live steam to the condenser, and when the tem-

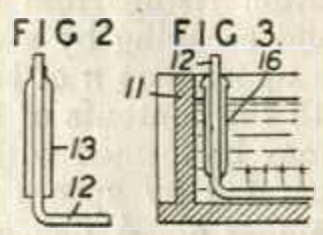
perature is too high, to open a valve 7 allowing hot water to run away. If the prime mover 1 is connected in parallel with other prime movers, its operation is arranged to yield an amount of exhaust steam sufficient to heat the required amount of hot water. In this case the valve 7 is omitted and the thermostat operates the supply valve by the prime mover. The valves are operated by loaded pistons 8, 9, controlled by oil under pressure admitted through pipes 10, 11, or by systems of levers. In the case of a prime mover tapped to yield a supply of heating steam, the valve 6 is arranged to supply additional live steam to the pipe conveying heating steam tapped from the prime mover.

266,048. Jackson Boilers, Ltd., and **Hargreaves, H.** Nov. 17, 1925.



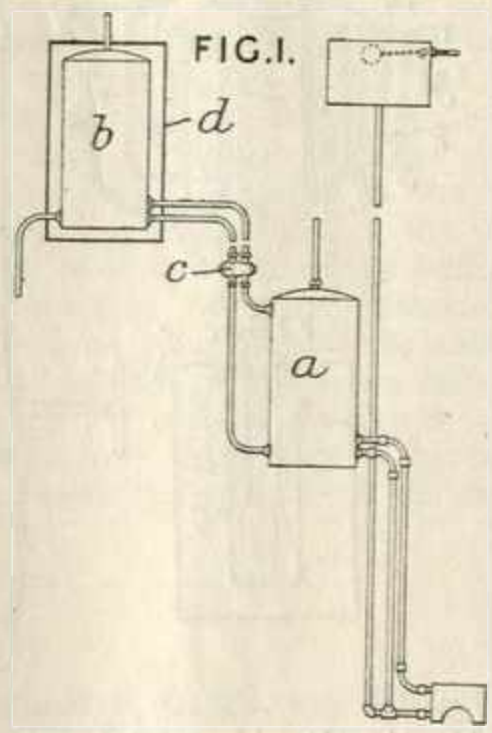
Water delivery.—Relates to an electric boiler, preferably self-feeding, comprising a water chamber 4 connected to a boiling chamber 8 having a pipe 10 leading to a collecting chamber 11 fitted with draw-off means 12, and consists in providing an overflow pipe 13 extending from the collecting chamber to the lower part of the water chamber. In Fig. 1 a baffle 15 is fitted in the water chamber above the opening to the overflow pipe. In Fig. 2 the pipe 13 may be fitted in either of the positions shown. The water supply is connected to a chamber 17 fitted with a float-operated valve. Any steam formed in the water chamber is conducted to the chamber 17 by a connected 22.

266,075. Callebaut, C., and **Blicquy, J. de.** Dec. 4, 1925.



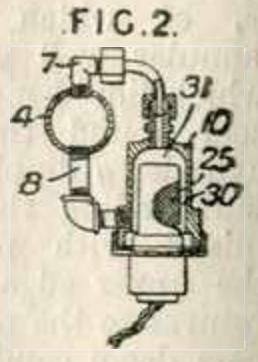
Heating liquids.—In a dye-vat or other vessel 11 liquid is heated by injection of steam through a pipe 12 which passes vertically through the surface of the liquid and then horizontally. The vertical part has an enclosing shroud 13, 16 closed at one or both ends to allow a vapour-space within the shroud to prevent excessive heating near the surface. One example shows a shroud open at the bottom and the other at the top. A modified form closed at both ends but with a vent to the space above the liquid is also described.

266,121. Baxenden, T. G. Feb. 9, 1926.



Heating water.—In a domestic hot water system, the hot water tank or an auxiliary tank is vacuum-jacketed to prevent loss of heat. In the example shown, the hot water tank *a* is connected to an auxiliary tank *b* having a vacuum jacket *d*. The auxiliary tank may be cut off from the main tank by a double plug cock *c* controlling the two connecting pipes. Valves may be provided to permit the flow of water from the main to the auxiliary tank when water is drawn off from the latter, and the arrangements for cutting off the auxiliary tank may be automatic.

266,137. Johnstone, E. C. March 1, 1926.

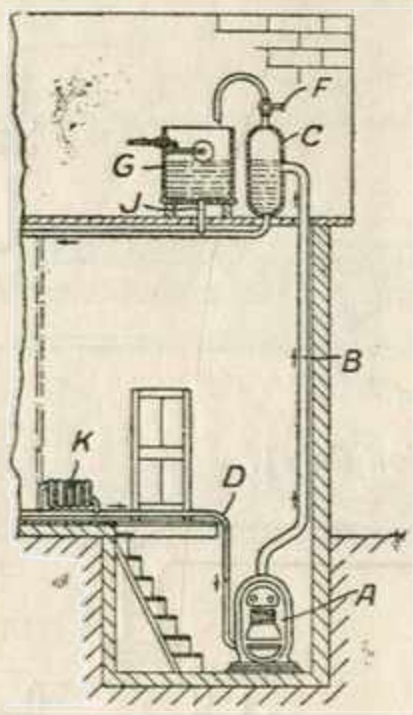


Portable heaters.—In connection with the circulating water system of a motor car a heating attachment for preventing freezing is permanently combined, consisting of a casing threaded to receive a heating means occupying the major part of the casing so as to leave a narrow water space. In the example shown the casing 10 receives the electric heater 25, the water space 30, 31 communicating with a circulation pipe 4 by the tubes 7, 8 or by

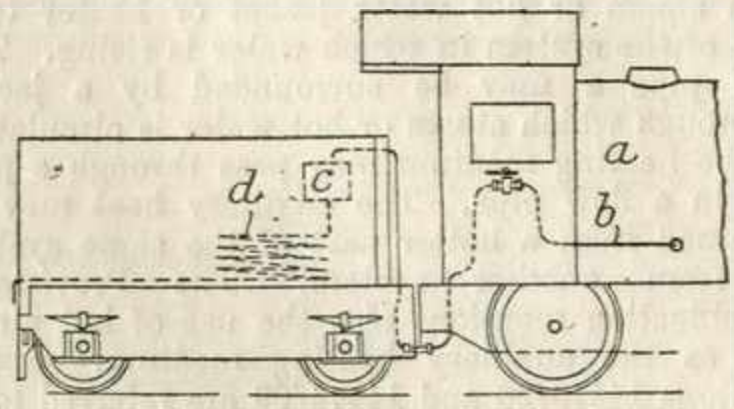
a single connection. A gas burner may be used within an inner casing, replacing the electric element.

266,147. Gaskell, W. H. March 10, 1926.

Heating water.—In a system for supplying hot water for baths &c., or for heating radiators, a boiler A is connected by a flow pipe B to the middle of an expansion tank C below the normal water level, the tank being provided with a hand-operated relief valve F. The return pipe D supplies the radiators &c. K and is also connected by a pipe J to a float-valve controlled cold water supply tank G. Any discharge from the valve F is received by the tank G.



266,184. Muller Ges., P., and **Ostertag, J.** June 4, 1926. *Addition to* 198,748, [*Class* 46, Filtering &c.].



Feedwater, heating.—The invention in the parent Specification is modified by allowing the sludge-water to discharge continuously to waste, the filter being eliminated. In the example shown the sludge passes through a valve-controlled pipe *b* into an open-topped reservoir *c* mounted above the water-level in the tender: steam released is condensed on the surface of the water and the sludge passes through the coiled pipe *d* to waste, heating the tender-water. Specification 200,263 also is referred to.

266,206. Babcock & Wilcox, Ltd., Brown, A. Hall-, and **Jones, E. W.** July 23, 1926.

FIG. 4.

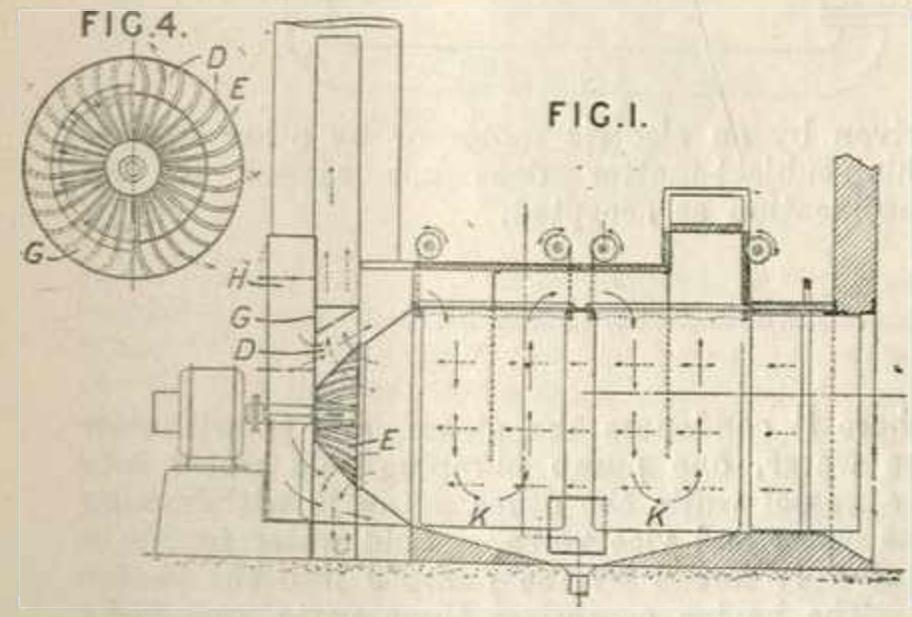
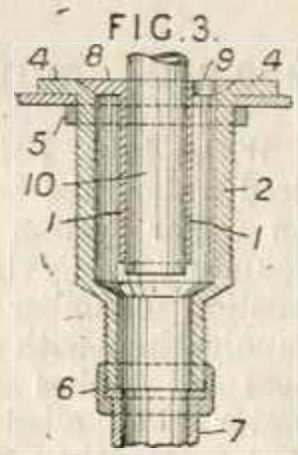


FIG. 1.

Heating air.—A heat exchanger comprises a fan presenting adjacent passages for two fluids impelled by the fan disposed to permit heat transfer from one to the other and a cellular structure adjoined to the fan, presenting adjacent passages for said fluids contrived to cause the fluids to flow in thin sheets. In the example the fan is constructed with hollow blades forming alternate passages D, E for air and hot gas. The back plate G has openings through which air from the casing H enters the passages D flowing substantially parallel to the axis to pass through hollow thin walled cells K. Hot gases flow about and between the cells to enter the fan at the eye and be discharged tangentially through the passages E.

266,232. Taylor, T. W. Sept. 10, 1926.

FIG. 3.

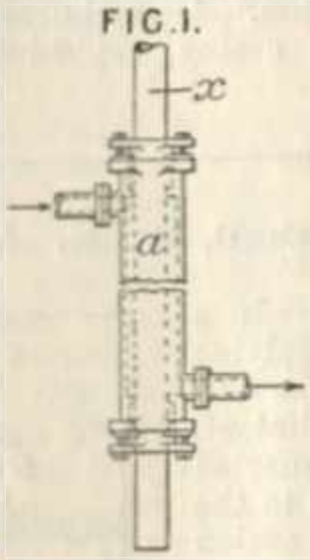


Heating water.—A circulation fitting for use with a common hot and cold cistern of a hot water system comprises a tubular member 2 having a flange 4 which rests on the bottom of the tank, and a securing nut 5. The lower end of the member 2 is reduced and threaded to receive a union 6 which secures the return pipe 7 to the boiler. An inner member 1 has a flange 8 which rests on the flange 4, and an opening 9 is provided to permit of circulation between the pipe 7 and tank. The member 1 receives the pipe 10 from the float-controlled cold water inlet valve.

266,499. Ransom, A. Jan. 2, 1926.

Heating water.—The circulation of water in a heating system is accelerated by the application of a steam or hot water jacket or heater to a part of the system in which water is rising. The flow pipe *x* may be surrounded by a jacket *a* through which steam or hot water is circulated, or the heating medium may pass through a pipe within a flow pipe. The auxiliary heat may be obtained from a hotter part of the same system of from another system. The Provisional Specification mentions also the use of hot air or gas as the auxiliary heating medium. Specifications 14473/99 and 14474/99 are referred to.

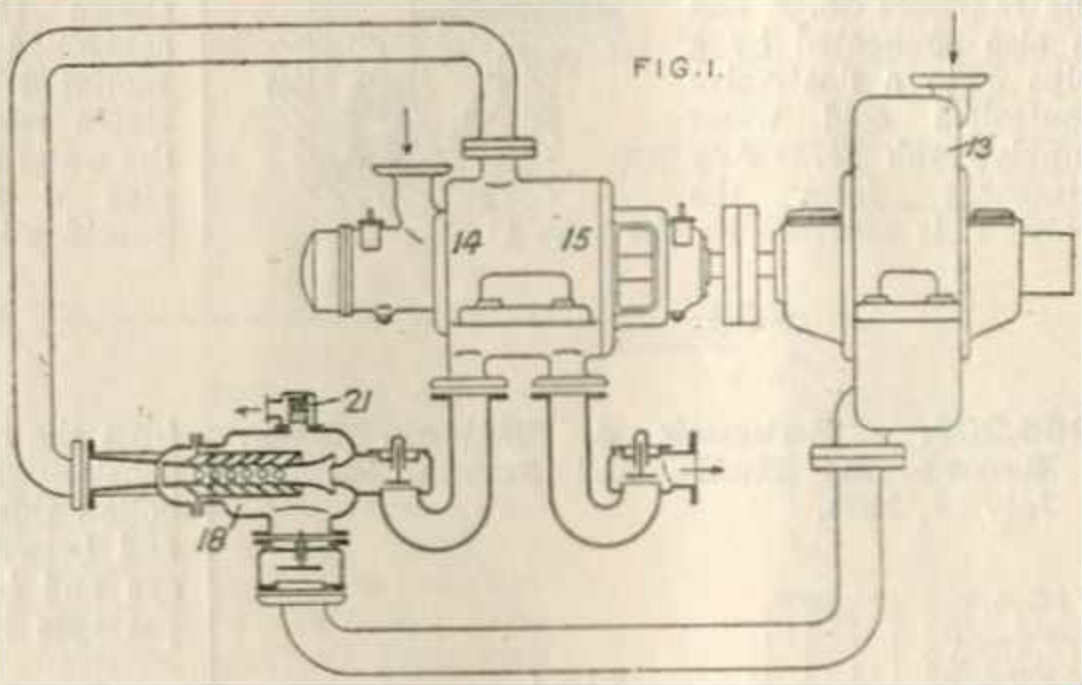
FIG. 1.



266,733. Heinl, F. March 1, 1926, [*Convention date*].

Feedwater, heating.—The pressure of hot feedwater is raised by a pump above that at which the water boils in order that the feedwater may take up the heat of and condense the exhaust steam from the engine driving the feed pump. Centrifugal pumps 14, 15 supplying hot feedwater are driven by a steam turbine 13 which exhausts into an ejector condenser 18 between the pumps. A relief valve 21 allows the exhaust steam to escape when its pressure rises above a predetermined limit. A spray or a surface condenser may be used in place of an ejector condenser.

FIG. 1.

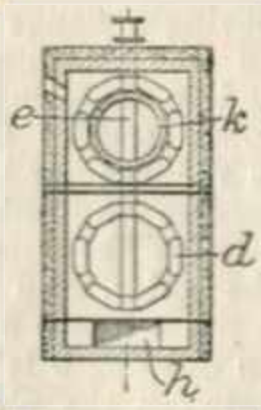


According to the Specification as open to inspection under Sect. 91 (3) (a), one or more injectors supplied with live steam receive hot water from the feed pump or are arranged between the stages of a multi-stage feed pump driven by an electric motor or by other means. This subject-matter does not appear in the Specification as accepted.

266,952. Willmeroth, E. May 28, 1926.

Water-tube boilers.—An oil-fired water-tube boiler comprises an upper system of tubes surrounding a cylindrical combustion chamber *k* and communicating with a lower system of tubes *d* to which water is supplied by a pipe *e*. The water then passes through the upper system of tubes to an outlet at the top.

FIG. 2.



266,953. Blunt, E. H. Aug. 31, 1925.

Feedwater, heating.—A feedwater heater for locomotives comprises a heater vessel with means for admission of steam and two pumps alternately operable to pump cold water into the heater, where it condenses the steam, and to withdraw the water, one pump pumping cold water into the vessel while the other pump is withdrawing hot water and vice versa. Cold water from the tank 1 is forced by the pump 9 into the heater 5. The heater comprises three parts, one main part, a lower suction part at one side, and an extension of the steam space. Exhaust steam from the engine cylinders passes to the heater by the pipe 6. The spray-head 224, Fig. 50, discharges water against a deflector 245 over trays 246 into the lower part of the heater from which it is withdrawn from under a baffle 246*a*. The spray-head has three groups of nozzles 227, 228, 229, Fig. 51, and admission of cold water to one, two or all is governed by the pressure in the heater. This control of cold water acts as a variable restriction in the pump delivery thus slowing the pump on the fall of steam pressure in the heater. The arrangement, Fig. 49, comprises a piston 230 connected to a double piston-valve 232 controlling ports 236, 237 leading to the second and third groups. Alternatively, a valve

similar to 232 may simply act to cut off cold water admission at a low water level. One row of nozzles may be lower than the others to ensure submerging if the water lever rises, with consequent reduction of condensation. The input of cold water is varied, in addition to the means mentioned above, by governing the [illegible] supplied to the pump in accordance with the pressure in the heater by a control valve 175, which may have an adjustable by-pass to enable the pump to continue working slowly even if the main valve is shut. Moreover a float operated

FIG.1.

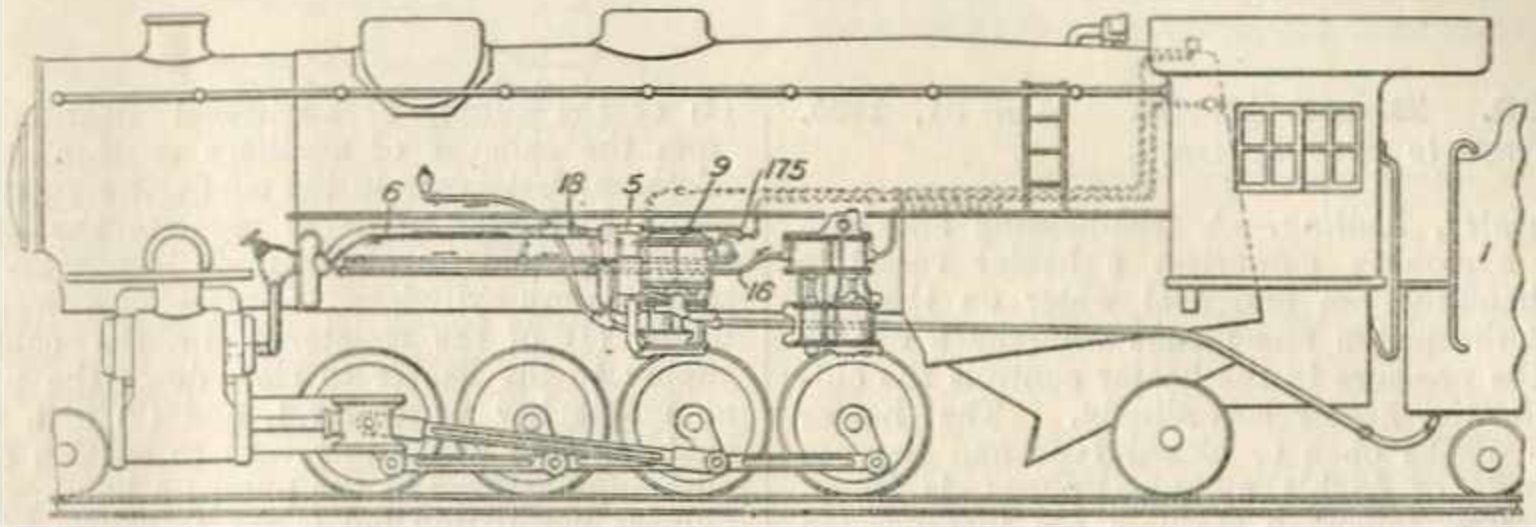


FIG.42.

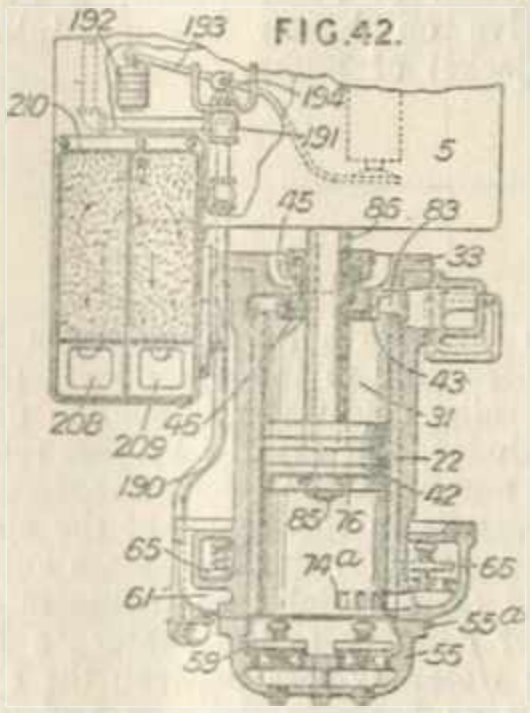


FIG.50.

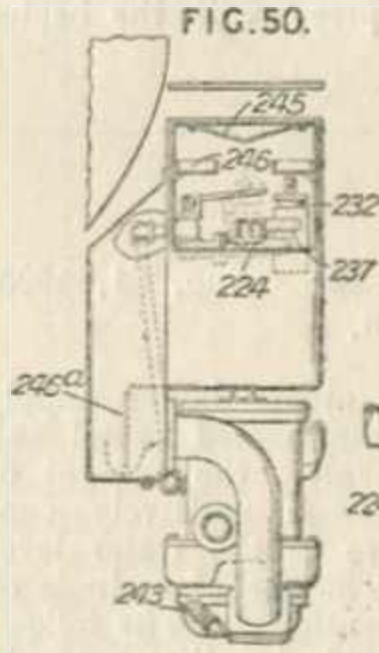


FIG.51.

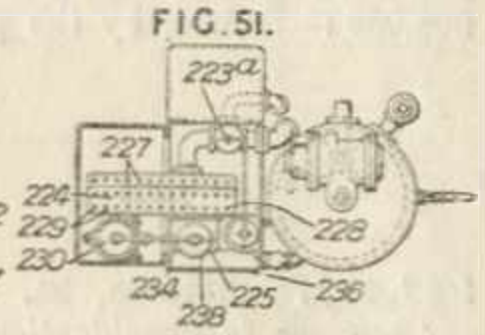
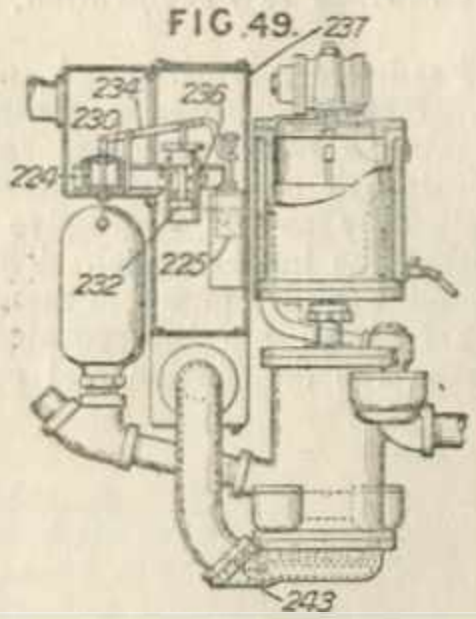


FIG.49.



valve 223a, Fig. 51, may control a by-pass returning cold feed to the suction side of the pump. The valve 223a may be a poppet valve the lift of which is prevented or regulated by the contour of an eccentric cam rotated by the float arm as described later in connection with the valve 191. In addition a hand-valve controlled by a by-pass between the cold-water ends of the pump cylinders may be provided. The float 225 operating the valve 223a may be arranged so that at extreme low water its weight bears on an extension of the lever 234, Fig. 49, connecting the control valve 232 of the rows of nozzles to slow down or stop the pump. The withdrawal of hot water by the pump is decreased on a fall in water-level by providing a by-pass 190, Fig. 42, leading from the hot water side of the pump to the heater vessel, controlled by a poppet valve 191 normally kept closed by a weight 192 on a float arm 193 operating a cam 194 bearing on the upper end of the projecting stem of the valve. As the float falls the contour of the cam allows the valve to rise under the pump pressure, hot water passing therethrough back to the heater. A further control of the amount of water withdrawn is provided by a hand-operated valve 243, Fig. 50, on a by-pass from the top side of the hot-water suction valves to the bottom, or by a similar valve on a by-pass between the hot water chambers of the two pumps. If the main supply of exhaust steam to the heater vessel fails, as for example when the engine is running light, steam can be admitted to the pipe 6, through a suitably adjusted check-valve 18, from the exhaust pipe 16 connected to the air compressor, feed pump or other auxiliaries which normally exhaust to atmosphere. If the steam pressure in the heater is unduly high a relief valve may pass excess steam to the cylinder jackets of the feed-pump. Means are provided for filtering the hot water on its way to the boiler by fitting detachable filter boxes 210 to the side of the heater 5, the communicating apertures 208, 209 being closable by doors which also serve to by-pass the filter if necessary. In a modification the filter boxes are inserted in extensions of the casing.

267,408. Muller Ges., P., and **Ostertag, J.** Sept. 13, 1926. *Addition to* 198,748, [*Class* 46, *Filtering &c.*]. *Drawings to Specification.*

Feedwater, heating.—Boiler sludge-water is continuously discharged through a single conduit, part of which is disposed in a feed-tank forming a feed heater, the expansion tank and the filter described in the parent Specification being dispensed with. Specification 266,184 also is referred to.

267,450. Blunt, E. H. Aug. 31, 1925. *Drawings to Specification.*

Feedwater, heating.—A feed-heating and supplying apparatus comprises a heater vessel, a pump handling hot and cold water on the two sides of the piston and means whereby a rise or fall in the pressure in the heater controls the output from the heater accordingly. The heater may be of the open or closed type and the use of a single or double cylinder pump is mentioned. The following features are incorporated in the example given, the description and application being the same as set forth in Specification 266,953 :—Control by the pressure in the heater (1) of the supply of additional heating steam from the exhaust of auxiliary engines, (2) of a frictional resistance in the cold-water supply from pump to heater so as to regulate the speed of the pump, and (3) of the main live-steam supply to the pump cylinders. Control by a float in the heater (1) of the resistance in the cold water supply to the heater to slow down the pump at an undue low water level, and (2) of a by-pass enabling cold water to return to suction or other pumping chamber of the pump; a hand-controlled by-pass permitting hot water to return to heater or to suction of other pump; a high-pressure relief valve on heater opening into a steam cylinder-jacket of pump.

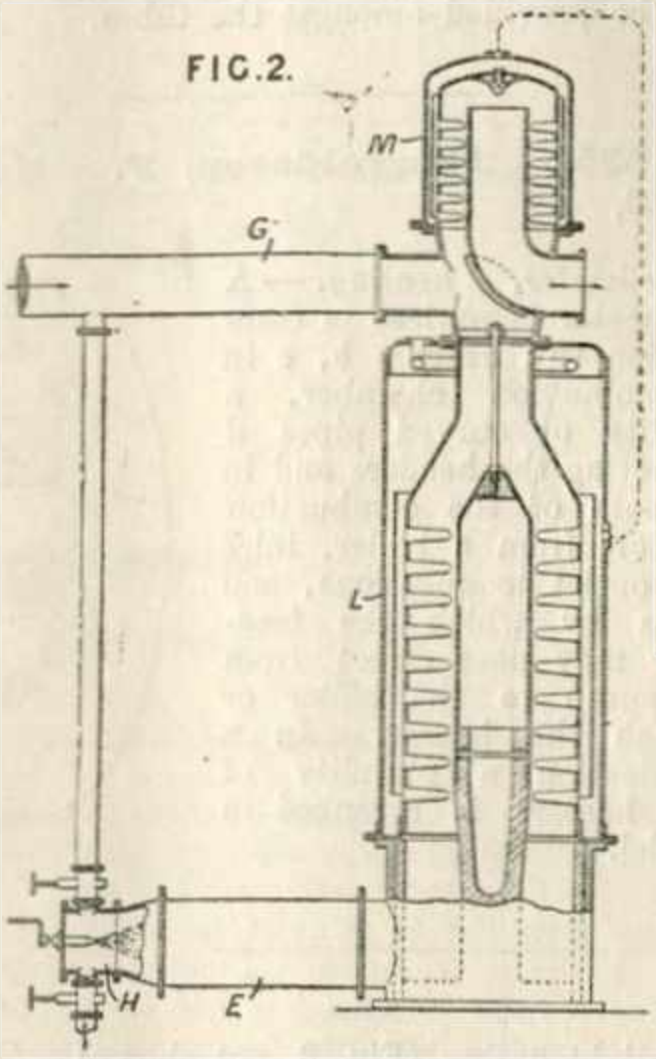
267,451. Blunt, E. H. Aug. 31, 1925. *Drawings to Specification.*

Feedwater, heating.—A steam boiler supply apparatus comprises a steam-heated vessel and a pump-actuated by-pass valve, the amount of opening or closing of which is positively controlled by means responsive to the water level within the heater-vessel. The use of a single or double cylinder pump is mentioned. The following features are incorporated in the example given, the description and application being the same as set forth in Specification 266,953 :—Control according to the water level (1) of a by-pass returning cold water to suction or the other water cylinder, and (2) of a by-pass returning hot water to pump suction : control according to the steam pressure in the heater of the speed of the pump acting on (1) the live-steam supply to the pump and (2) a variable throttling means in the cold water delivery to the heater : a hand regulated hot water by-pass between the cylinders of the pump or between delivery and suction : a heater vessel in three main parts.

267,452. Blunt, E. H. Aug. 31, 1925. *Drawings to Specification.*

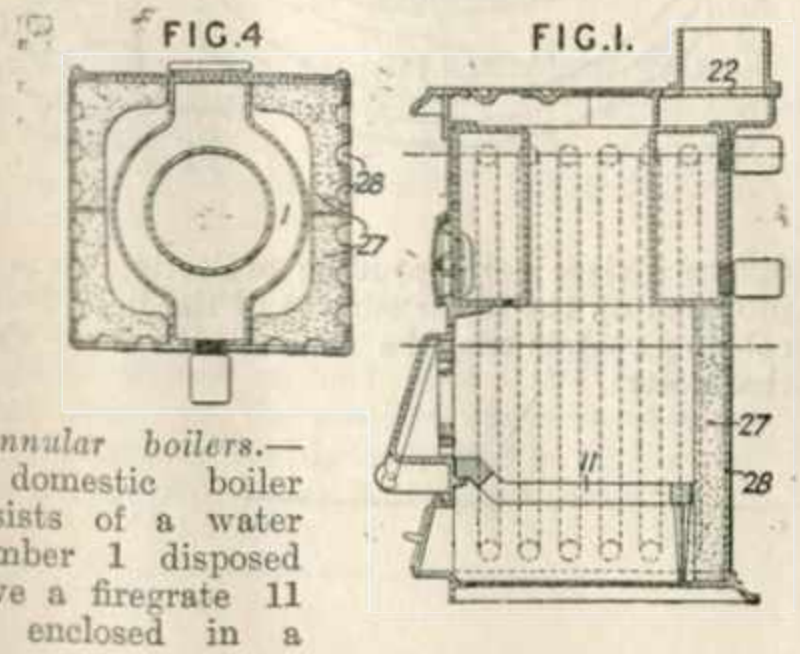
Feedwater, heating.—A feed-heating and supplying apparatus comprises a heater-vessel, a pumping unit handling hot and cold water on the two sides of the piston and means whereby the vessel is supplied with auxiliary steam when the main supply of heating steam is deficient. The use of a single or double cylinder pump is mentioned. The following features are incorporated in the example given, the description and application being the same as set forth in Specification 266,953 :—A heater vessel in three main parts : control by the pressure in the heater of the speed of the pump through (1) the live-steam supply to the pump and (2) the insertion of a frictional resistance in the cold water delivery to the heater; control according to the water level of a by-pass returning cold water to suction or other cold water cylinder : a hand-regulated hot water by-pass between the hot-water chambers of a two-cylinder pump.

267,641. Clarkson, T. Dec. 30, 1925.



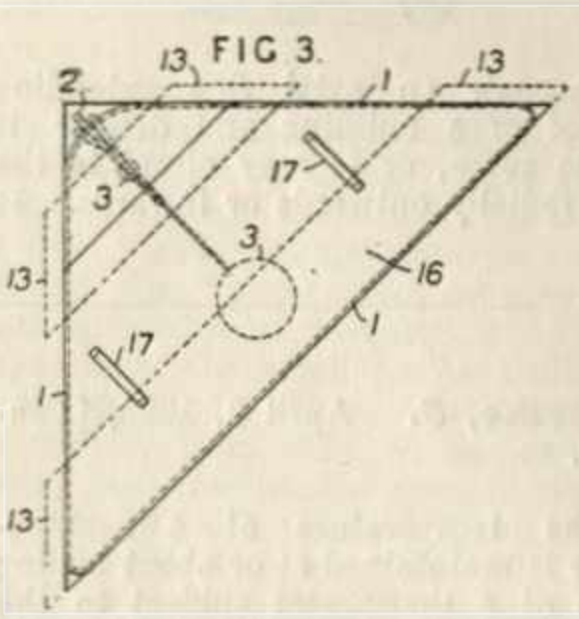
Feedwater, heating.—In a steam boiler or water heater heated by the exhaust gases from an internal combustion engine and by a liquid fuel burner, a valve-controlled by-pass is provided between the exhaust gas passage and the burner tube to equalize the pressure of the gases delivered from the two sources and allow them to be used simultaneously. The exhaust gas passage G leading into a feed-heater M, of the kind described in Specification 211,342, arranged above a boiler L of the kind described in Specification 244,931 is connected by a by-pass containing a valve to a burner tube E opening into the base of the boiler.

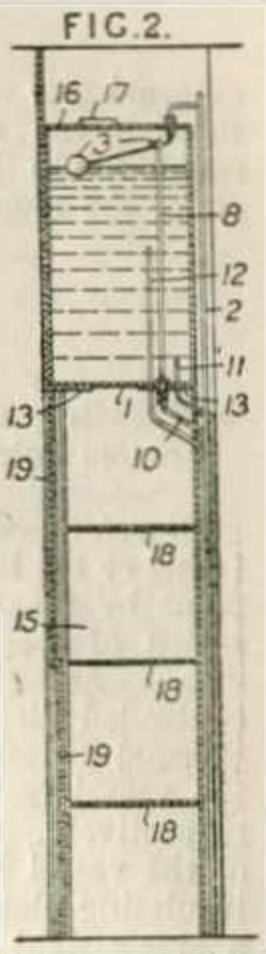
267,650. Kitchen, J., and **Balmforth & Co., Ltd., T.** Jan. 8, 1926.



Annular boilers.—A domestic boiler consists of a water chamber 1 disposed above a firegrate 11 and enclosed in a casing lined with refractory blocks 27. The fire gases pass upwardly through the centre of the water chamber to the flue 22. The water chamber is preferably made of copper, while the front of the casing is of cast iron and its sides and rear are formed by steel plates lined with asbestos. Vertical flutings 28 are formed in the refractory blocks so as to register with air openings formed near the upper and lower edges of the steel plates. Specification 214,693 is referred to.

268,191. Taylor, T. W. June 15, 1926.





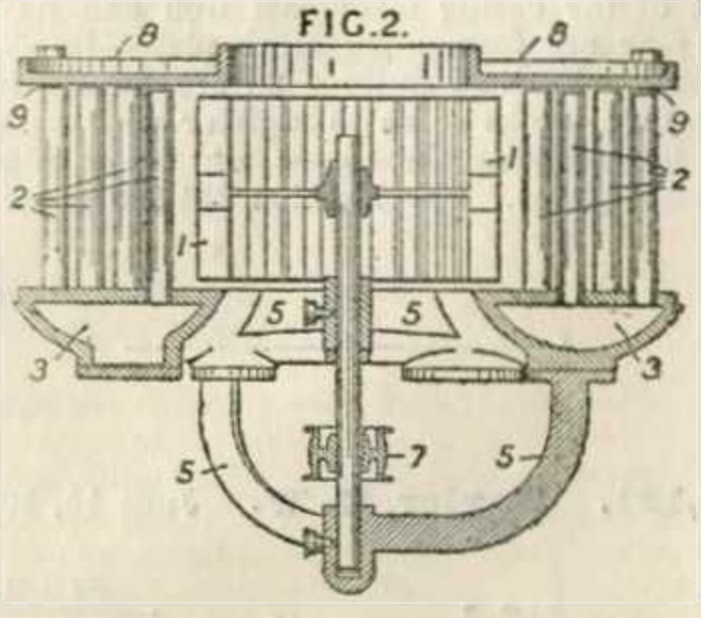
Heating water.—In a domestic hot water supply system of the kind in which a common hot and cold cistern is used, the cistern is adapted to be fitted into the corner of a room and to permit of the pipe connections passing between the tank and the corner. The tank 1 is triangular in plan and is is rounded at the rear to receive the pipes 2. Cold water is supplied by a float valve 3, and is delivered by a pipe 8 into the mouth of the return pipe 10 to the boiler. 11 is the flow pipe, and 12 the draw-off pipe. The tank has a cover 16 with handles 17. A cupboard 15 below the tank is fitted with shelves 18 and vertical sliding doors 19. The tank is supported by plates 13 built into the walls.

268,213. Pickard, F. H. Aug. 27, 1926.

Heating air.—Apparatus for circulating heated air in buildings comprises tubes 2 arranged around and parallel with the axis of a fan 1, the tubes being connected to a single annular header 3 to which the supply and outlet pipes of the

heating medium are connected. The tubes are closed at their upper ends, above which is a capping 8 secured by bolts 9. The fan may draw

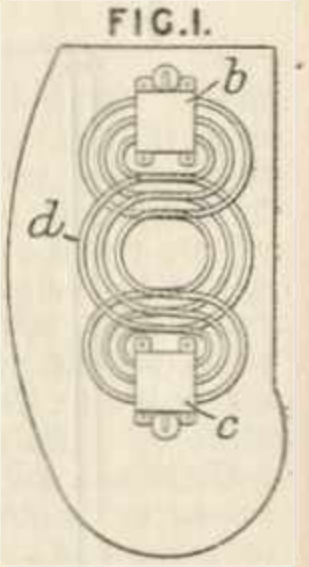
FIG.2.



external air through an axial flue extending through the roof of a building and deliver it radially into the room, or it may circulate the air of the room radially outwards or inwards. It may be driven by a belt pulley 7 or a directly connected motor carried by a spider 5. Baffles may be provided amongst the tubes.

268,535. Thorvaldsson, F. March 9, 1926.

FIG.1.

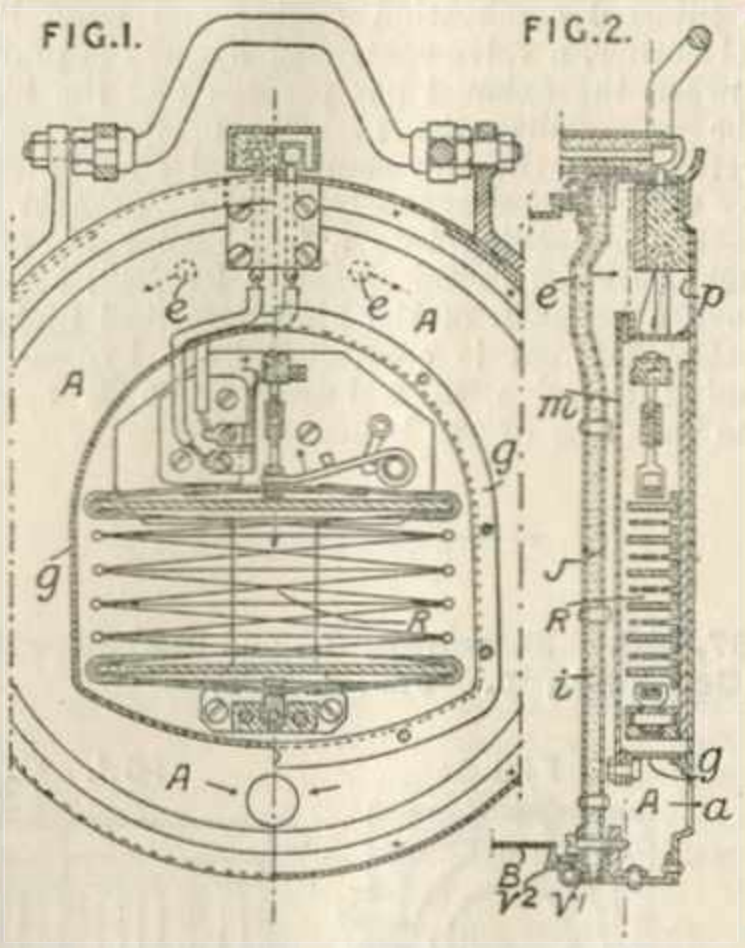


Feedwater, heating. — A feed-heater comprises in combination two headers *b*, *c* in a combustion chamber, a plurality of curved pipes *d* connecting the headers and in the path of the combustion products from a boiler, inlet and outlet connections, and means by which the feed-water may pass direct from the pump to the boiler or through the heater. In a modification a plurality of such heaters is arranged in parallel.

268,813. Jerike, J. April 3, 1926, [*Convention date*].

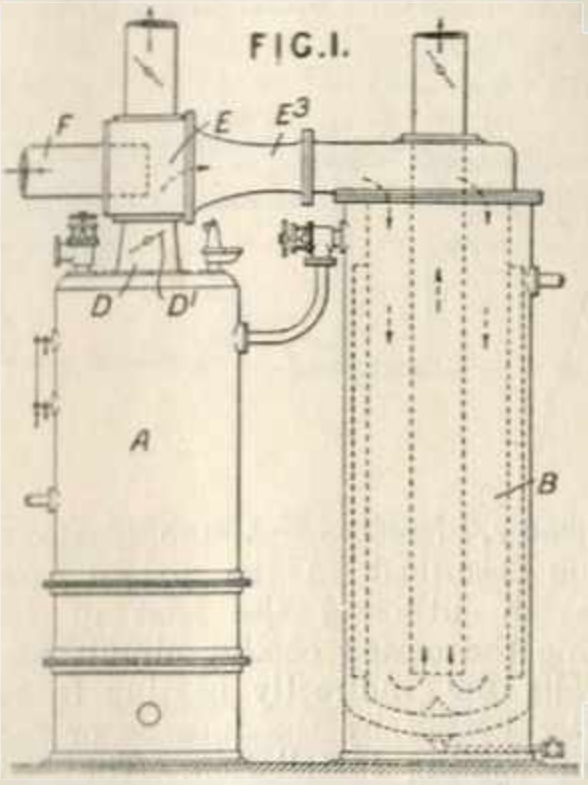
Digesters.—The temperature of a cooking-vessel or the like is maintained at or about boiling point by means of a thermostat subject to the action of steam which controls the heating device. An electric heater is preferably used, controlled directly or through a relay by the thermal switch. Figs. 1 and 2 show the lid of the vessel from below, and a section of the lid respectively. The lid A rests within a recess v^2 of the vessel B, and comprises a plate *p* and an insulating plate J containing asbestos *i*, enclosing a steam-tight casing *g*, *m* containing the thermostat R. When steam is not passing through the openings *e*, *a* to heat the thermostat, the latter is cooled by the atmosphere. The opening *e* may be provided with a valve and strainer. Alternatively, the thermostat may be placed above the plate *p* where it is cooled more rapidly by the air, and in that case is heated only by conduction from the plate *p*. Several vessels may be superposed, only the lowest being heated, and may be placed under one steam-tight cover. The thermostat is preferably that described in Specification 268,812, [*Class* 38 (v), Electric switches &c.], and a snap-action switch may be employed, or the switch described in Specification 268,811, [*Class* 64 (ii), Heating systems &c.]. The lid A is provided with a switching device operating when it is removed or replaced, which may comprise a plug carried by the vessel and a socket carried by the lid, combined with a watertight casing (Fig. 6, not shown). A single lid may be employed with a group of cooking vessels having rims of the same size, or if of

FIG.1. FIG.2.



different sizes corresponding projecting rings are provided on the lower surface of the lid. Several cooking vessels may be controlled by a single thermostat.

268,854. Clarkson, T. Dec. 30, 1925.

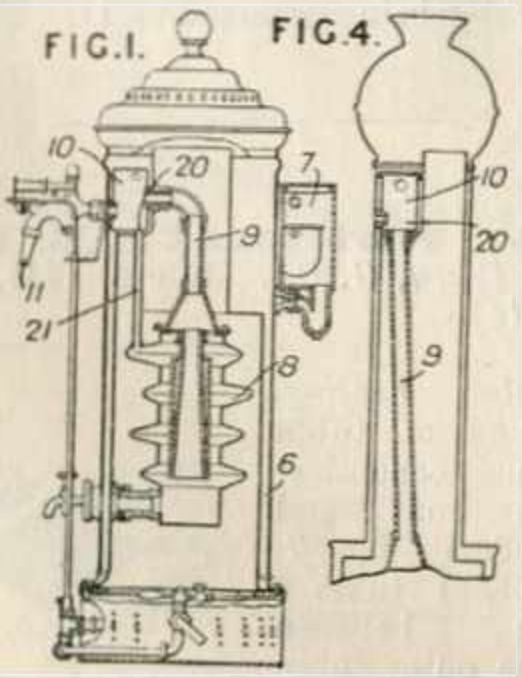


Feedwater, heating.—An oil fired boiler A of the thimble-tube type described in Specifications 108,177, [*Class* 123 (ii), Steam generators]; and 211,342, 244,930, and 244,931 is fed with water from a feed heater B, which is also of the thimble-tube type and is heated by the hot gases from the boiler mixed with the exhaust gases from an internal combustion engine. The boiler outlet flue D and a gas engine exhaust pipe F open into a chamber E, from which the mixed gases are led through a contracting passage E^3 to the gas inlet chamber of the feed heater. The exhaust pipe and the inlet passage of the burner heating the boiler may be connected by a valve controlled bye-pass as described in Specification 267,641. Instead of leading the hot gases from the heater B directly into the atmosphere, they are conducted, according to a modification, into a third heater of the thimble-tube type which is connected to supply hot feed-water to both the main boiler A and the heater B, which then serves as a steam generator. When the main boiler is not working, the damper D^1 in the outlet flue is closed and the plant is heated by exhaust gases alone.

269,176. International General Electric Co., Inc., (Assignees of *Allgemeine Elektricitäts Ges.*). April 7, 1926, [*Convention date*]. *Addition to* 266,360, [*Class* 122 (v), Stuffing-boxes &c.].

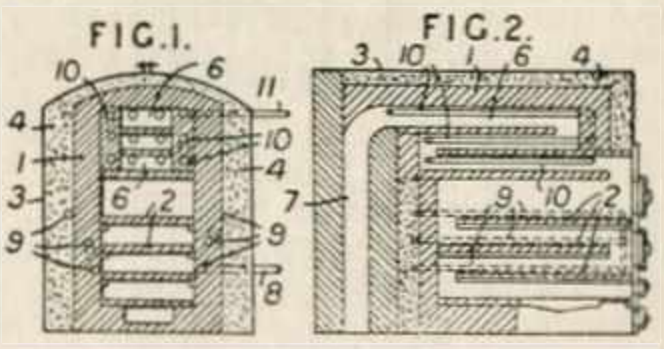
Feedwater, heating.—Turbine-blade shroudings are packed by centrifugal water seals, the water then being utilized as feedwater. The water is supplied first to the seals of the low-pressure stage and then to the higher stages in succession and is afterwards further heated if necessary.

269,326. Jackson Boilers, Ltd., Hargreaves, H. April 13, 1926.



Water supply and delivery.—Water passes from an automatic cistern 7 to the outer shell 6 of a boiler, and thence to the boiling chamber 8 connected by an expansion pipe 9 to a collecting box 10 from which boiling water is drawn off by a tap 11. The improvement comprises the replacement of the usual weeping hole 20 by a hole of larger size, connected to the boiling chamber 8 by a pipe 21, Fig. 1, or to the expansion pipe 9. In another form, Fig. 4, the expansion pipe 9 serves both for the delivery of boiling water to the box 10, and also for draining the box 10 through the weeping hole 20. Water is thus delivered to the box 10 through the weeping hole, which may be made larger without loss of boiling water by draining out at the same time as delivery.

269,397. Pedersen, F. I. Sept. 6, 1926.



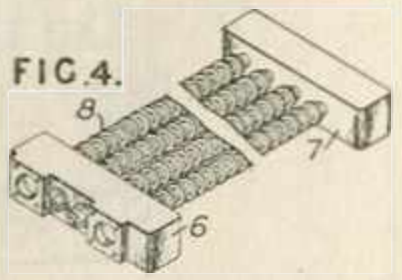
Water-tube boilers.—In a water heater having a series of superposed combustion chambers formed by imperforate fuel supports 2 for consuming dust fuel, and a continuous water heating pipe traversing the length of the furnace at different levels, the pipe is embedded in the walls of the furnace at the level of the combustion chambers and extends through flues 6 above. The brickwork is partly enclosed in a metal casing 3 between which and the wall 1 is packed insulating material 4. The flues 6 open into a flue 7 leading to the chimney. Water is supplied to the pipe at 8 and the lower bends 9 are

arranged partly within and partly without the brickwork 1 while the upper bends 10 are partly within the brickwork and partly in the flues 6, the hot water being removed at 11.

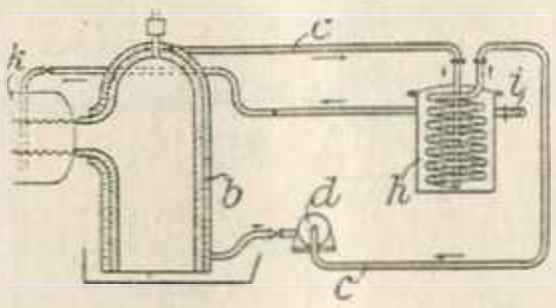
269,560. Sturtevant Co., B. F., (Assignees of *Derry, G. C.*). July 6, 1925, [*Convention date*].

Feedwater, heating.—A section of tubes for a fuel-economizer comprises front and rear headers 6, 7, equally-spaced tubes 8 extending between them, the outer tubes on each side being at differing distance from the ends of the header so that by arranging alternate sections in inverted relationship the tubes will be staggered in the apparatus. The inlet and outlet connections, which may be at one end of the section, are in the outer face of the header.

FIG. 4.



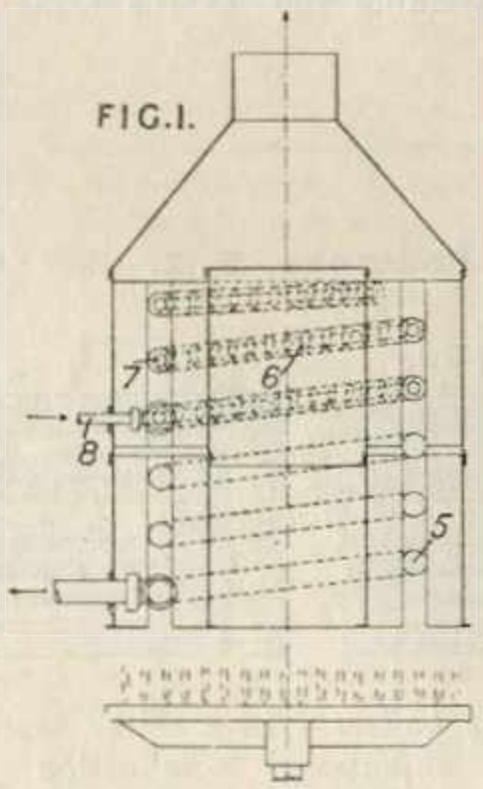
269,688. Reiser, H. Jan. 26, 1926. *Addition to* 259,681, [*Class* 51 (i), Furnaces and kilns, Combustion apparatus of].



Feedwater, heating.—A modification of the invention described in the parent Specification consists in utilizing the heat of the water traversing the closed cooling circuit for the furnace walls for indirectly heating feedwater for the boiler heated by the furnace or for another boiler or heating installation. The cooling circuit comprises the water jacket *b* of the furnace and the circulating pipe *c* which may include a pump *d*. Part of the pipe *c* passes in the form of a coil through a feedwater heater *h* arranged in the feed pipe *i* of the boiler *k*.

269,816. Ippen, O. Dec. 18, 1926.

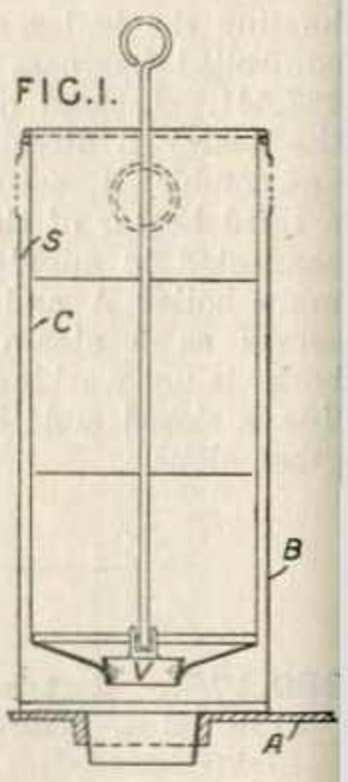
FIG. 1.



Water-tube boilers.—Concentric within and spaced from the upper part of a coiled tube 5 of a water heater is a tube 7 through which cold water flows, passing in at 8 and being delivered into the closed upper end of the tube 5. The spacing is effected by a coiled strip 6 of metal.

270,059. Redfern, W. D. March 23, 1926.

FIG. 1.

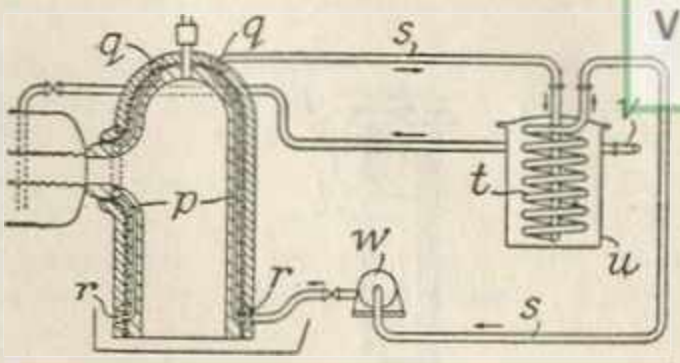


Washing-boilers.—A condenser for vapours comprises a water container C mounted in an outer casing B which is detachably fixed to the lid A, the interspace S being open to the vapour space in the boiling pan. The contents of the container can be emptied into the pan, as by removing the plug V.

270,201. Reiser, H. Jan. 26, 1926.

Feedwater, heating.—The walls of a pulverulent-fuel furnace are cooled by a pipe system, forming part of a closed circuit through which water is circulated, embedded in or located upon the inner surface of the walls, the heat taken up being carried outside the furnace system to heat-exchange apparatus for feedwater. The furnace

is provided with pipes *p* located in the walls and connected to upper and lower headers *q*, *r* in turn connected to a closed circuit *s* including a pump *w*. Part of the circuit comprises a coil *t* arranged in a vessel *u* to which feedwater is supplied, and then delivered in a heated condition to the boiler through a pipe *v*. The pipes *p* may be arranged in recesses formed on the inner surface of the walls.



270,250. Leek, A. E. May 1, 1924, [*Convention date*].

FIG.1.

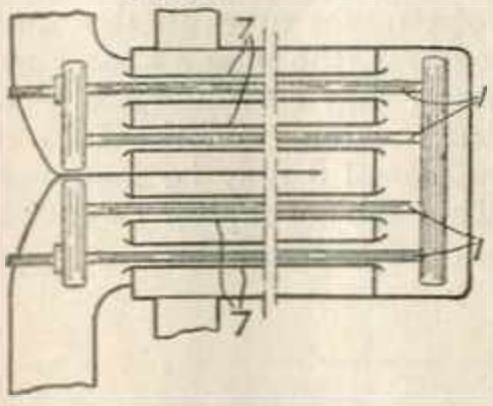
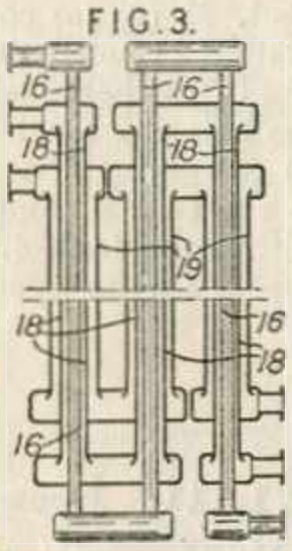


FIG.3.



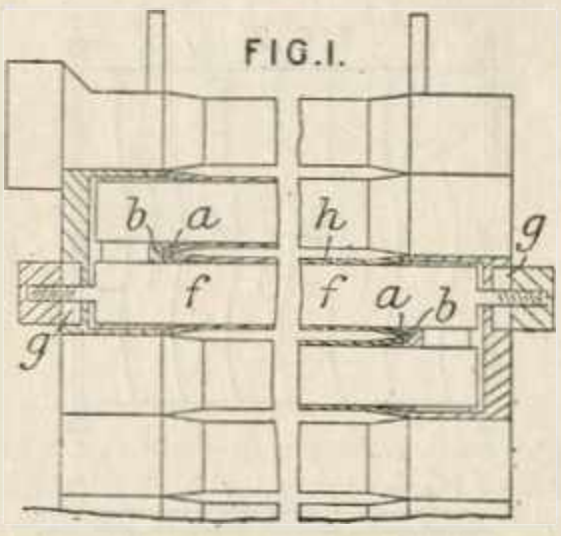
Heating air; feedwater, heating. — In a heat-exchanger, water is passed through groups of water-tubes 1 connected in a series arrangement and disposed coaxially within tubes 7 for conveying hot gases also in series arrangement. Air is passed over the surfaces of the tubes 7. The air and gas passages are stated to be formed so as to avoid any rapid change in cross-sectional area. Dead spaces within the casing may be filled by baffles or cross-plates. In a modification, Fig. 3, water, hot gases, and air pass respectively through the concentrically arranged tubes 16, 18, 19, individual units being connected in series. Specification 260,083 is referred to.

270,364. Brown, Sir A. W. June 12, 1926. *Drawings to Specification.*

Heating water; set-pans. — A heat-storing medium for use at temperatures above 300° F. comprises a heavy non-volatile mineral oil or oily compound. Examples of apparatus for employing this medium include an electrically-heated insulated container with an oven or a water-space or both in contact with the heat-storing medium; a stove in which the medium is heated in one part and circulated through a space containing solid heat storage masses and also round an oven; and a set pan with the medium in a directly heated jacket arranged so that when the medium is hot the jacketed pan can be removed and the cooking &c. completed by the stored heat.

270,537. Wilkinson, H. Aug. 18, 1926.

FIG.1.



Heating liquids.—Apparatus for heating liquids such as milk, wort, &c. has horizontal spaced-apart tubes extending between chambered end-members by means of which the heating medium is caused to flow in a generally upward direction through the tubes over which the milk &c. falls, all joints being made with rubber inserts. Flattened tubes *h* have flared ends *b* fitting over coned projections *a* with rubber packing between. Extending through each tube is a metal strip *f*, the edges of which bear against the top and bottom of the tube. Certain of these strips have prolongations extending through the side members and screwed at the ends to take nuts &c. by means of which the apparatus is held together, rubber buffers *g* being interposed. When assembled, the ends of the tubes *h* butt against the end members.

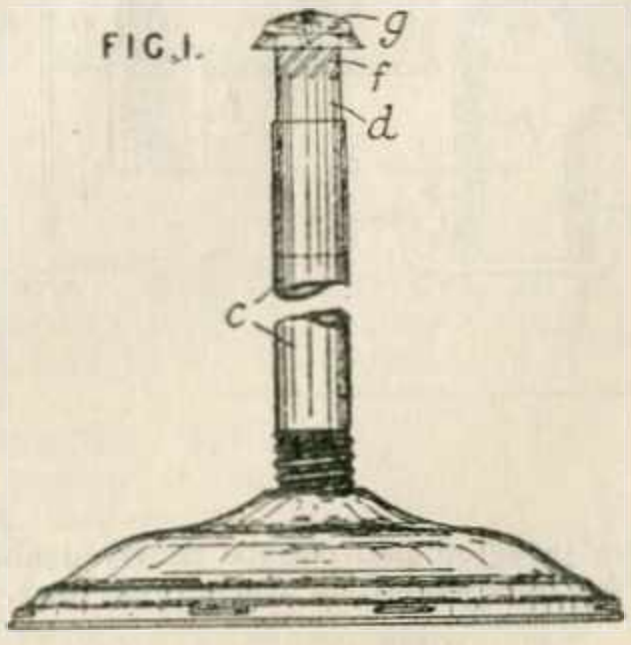
270,568. Joneleit, J. Nov. 5, 1926.

Washing-boilers.—A circulator for washing-boilers is provided with inclined parallel slots *f*, overlapping one another, at the top closed end of the extension *d* of the riser-tube *c*. A cap *g* may be adjusted to direct the jets downwards.

(*For Figure see next page*).

270,568.

FIG. 1.



270,600. Howden & Co., Ltd., J., and **Hume, J. H.** Dec. 30, 1926.

FIG. 3.

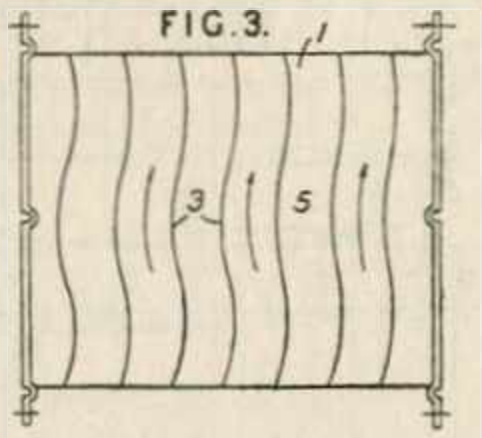
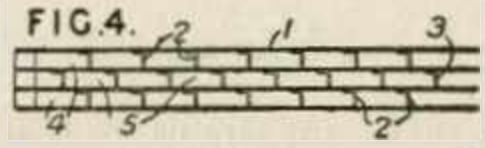


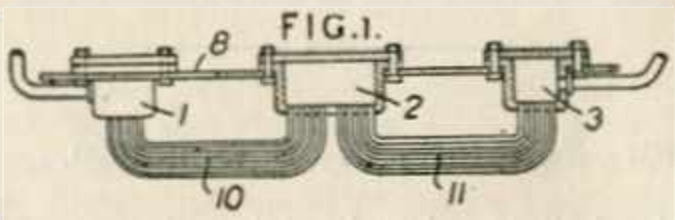
FIG. 4.



Heating air.—An air heater comprises rows of cells 4, 5 traversed by hot gases and by air to be heated, and constructed of parallel plates 1 provided with spacing ribs 2, each plate forming the base of a row of air cells on one side and of a row of gas cells on the other. The plates are removable individually or in sets. Specification 246,676 is referred to.

270,776. McCallum, J., and **Anderson, H. P. H.** Oct. 1, 1926.

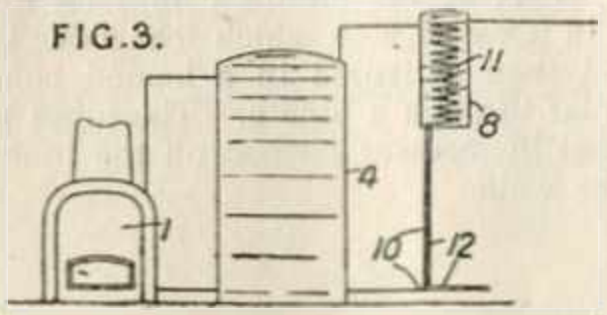
FIG. 1.



Feedwater, heating.—A liquid heater comprises separate trough-shaped headers 1, 2, 3 connected in series by tubes shown as shallow **U**-tubes 10, 11, the headers being supported in a flue in apertures in a plate 8, which may form the crown or one of the walls of a furnace.

271,101. Billman & Co., Aktiebolag. May 14, 1926, [*Convention date*].

FIG. 3.

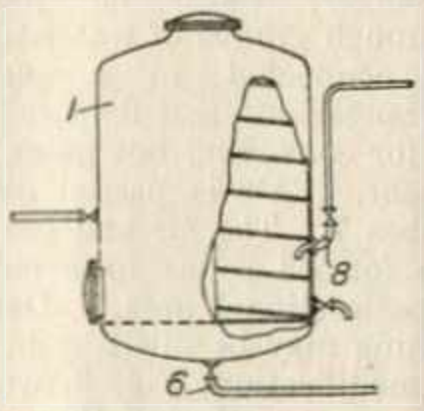


Heating water.—A tank 4 of large volume is placed in circulatory connection with the boiler 1, a water supply to be indirectly heated passing through a tube system 11 in a subsidiary tank 8 in circulatory connection with the tank 4.

The Specification as open to inspection under Sect. 91 (3) (a) comprises also the use of a tube system 11 consisting of straight tubes in the tank 8. In further modifications, the pipe 12 carrying the entering service water may surround the pipe 10 conveying the return water from the tank 8 to the tank 4, and the vessel 8 may be mounted within the tank 4. This subject-matter does not appear in the Specification as accepted.

271,111. Arentz, T. May 15, 1926, [*Convention date*].

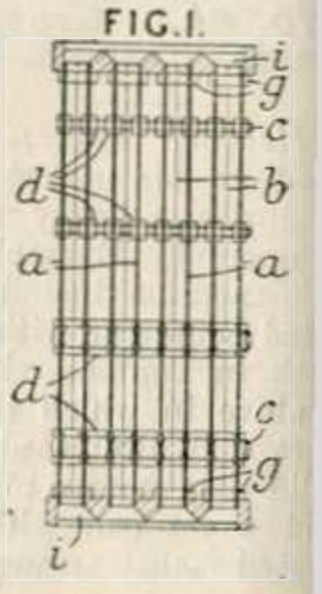
Digesters.—A boiler 1 particularly for whale oil extraction is provided with a separate steam blow-off pipe 8 in the lower half at a higher level than the drainage pipe 6 for glue-containing water.



271,461. Hartmann, P. E., (Assignee of *Hartmann, M. & E.*). May 19, 1926, [*Convention date*].

Heating air.—An air-heater comprises flat plates *a* spaced apart from one another by being held in the required position between nuts *d* on threaded bolts *c*. The nuts themselves may act as spacers. The forward and rear edges *b* of adjacent plates are bent inwards and welded to form pockets open at the top and bottom where they are secured to end-plates *i* in suitable slots.

FIG. 1.



The Specification as open to inspection under Sect. 91 (3) (a) comprises also the

provision of reinforcing iron strips *g* at the top and bottom edges and by intermediate longitudinal channel-section strips. This subject-matter does not appear in the Specification as accepted.

271,549. Wild, W., Wessels, H. P., and **Enochsen, E. B.** Feb. 22, 1926.

FIG. 6.

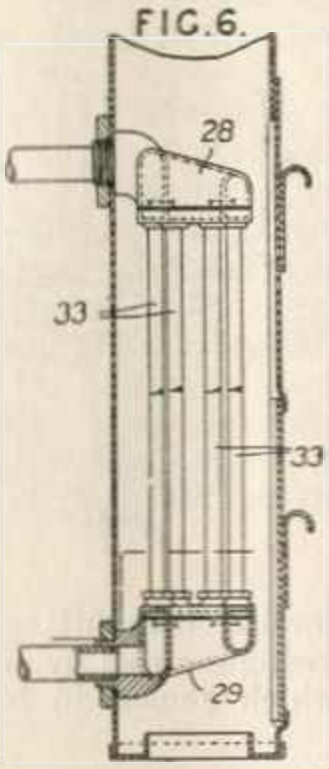
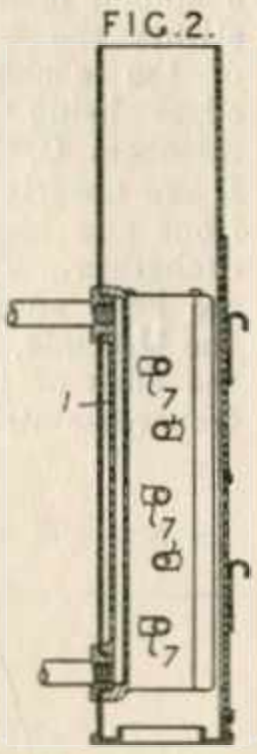


FIG. 3.

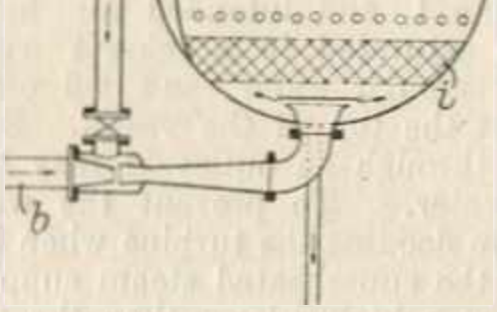
FIG. 2.



Block-form boilers; water-tube boilers; composite boilers.—A water-heater supported within the flue of a domestic stove is provided with a vertical gap in one side to allow of access for cleaning &c., a suitable door being fitted to the flue. Two constructions are described, one, Figs. 2 and 3, having a substantially annular water space 1 with or without cross tubes 7, the other, Fig. 6, having gapped ring headers 28, 29 connected by tubes 33. The headers may be shaped as shown to distribute water equally through the tubes. The tubes may be fixed to cover-plates bolted to the headers.

271,701. Müller, P. H. Sept. 28, 1926.

FIG. 1.



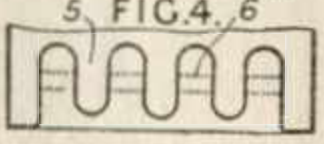
Heating liquids.—A surface heater in which steam admitted at *b* entrains, by means of an injector device, uncondensed steam from the top of the heater, so that it is re-circulated, is provided with a layer *i* of filling material over which condensate dropping from the tubes *f* trickles so as to expose a large area to the incoming steam to ensure that it is in a saturated condition.

271,703. Hanna, S. J., and **McVeigh, H. M.** Sept. 29, 1926.

Boilers; heating-surfaces, increasing.—A boiler, kettle or like vessel 2 provided with a bottom 1 raised above the lower edge 2^a of the side wall has two sets of external tubes 3 or water channels in the cavity thus formed, one set at right-angles to the other. In the modification shown in Fig. 4, channels 5 are cross-connected by tubes 6.

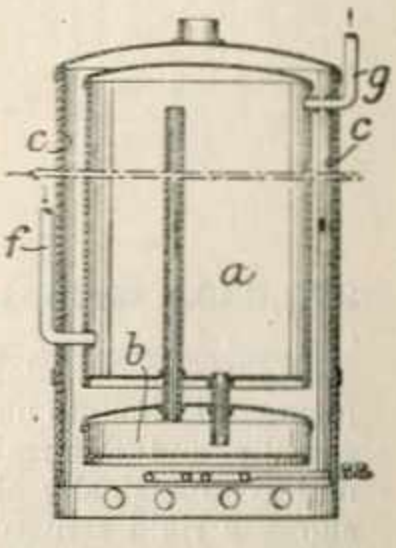
FIG. 1.

FIG. 4.

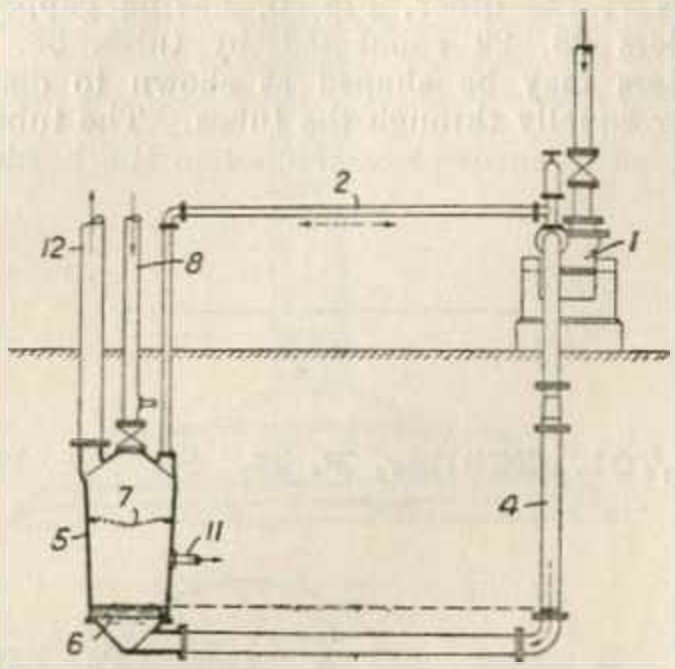


271,971. Smith, M. W. March 13, 1926.

Block-form boilers; composite boilers. — A boiler has a small capacity chamber *b* heated directly and connected by pipes to a larger chamber *a*, the whole being enclosed in a heat-insulated casing *c* between which and the chambers the products of combustion pass. External circulatory connections *f*, *g* are fitted to the larger chamber, the return pipe *f* entering near the bottom. A coiled pipe may replace the smaller chamber.



272,097. Ehrenburg, H. H. Nov. 10, 1926.



Feedwater, heating.—Steam with some degree of superheat, such as the exhaust from an auxiliary turbine 1, and intended for heating feedwater, is saturated in a closed vessel 5 by bubbling through water, and led off through a pipe 12 at the top of the vessel. Excess water taken off through an outlet 11 may be added to the feedwater. To prevent the water in the vessel from flooding the turbine when it is stopped a part of the superheated steam supply pipe 4 is arranged at a higher lever than the water outlet 11 and a small diameter pressure-equalizing pipe 2 connects the upper part of the vessel with the upper part of the supply pipe. The vessel is fitted with horizontal perforated partitions 6, 7; water is supplied through a pipe 8.

272,152. Muchka, J. June 7, 1926, [*Convention date*].

Heating air.—A heat exchanger is composed of plate members, which can be slid out laterally, being loosely connected to one another by **U**-shaped edge-members. In the example, plates A constitute the main body of the exchanger, the edges being held by members C. Plates B, D are used to form the front and back of the exchanger. The plates are kept apart by reinforcing bars fitting in to the **U**-bends, the whole being secured by studs on the ends of the bars, which engage in holes in transverse strips.

FIG. 1.

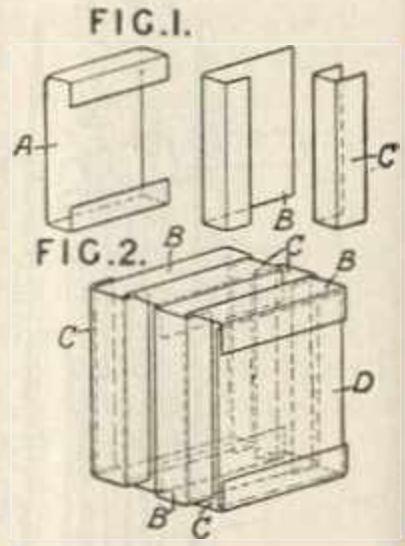
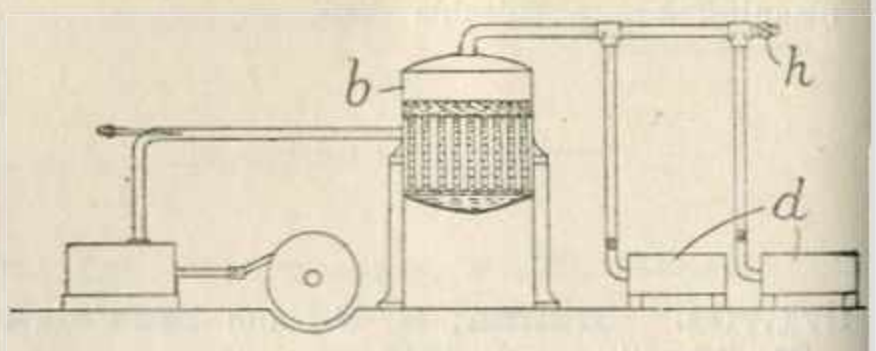


FIG. 2.

272,623. Gilmour, J. D. March 20, 1926.

Heating water.—The pressure of exhaust steam from an engine is raised by means of a live steam ejector or pump arranged in the exhaust pipe. The steam is passed to a heat exchanger *b* of the calandria type for heating and evaporating water. Fluid-pressure control means may be provided on the exchanger *b* to control the supply of steam to the ejector or pump.



272,633. Gribojedoff, N. March 23, 1926.

Digesters. — Rigid bodies or structures are formed of elments obtained by cutting a flat sheet spirally and deforming the spiral strip helically and symmetrically about a common axis. Fig. 1 shows a rigid structure formed from two opposed helical strips 20, 21 obtained as described, and Fig. 2 shows such a structure further stiffened by an edgewound helix 22. The strips may be used as reinforcement for pressure boilers.

FIG. 1.

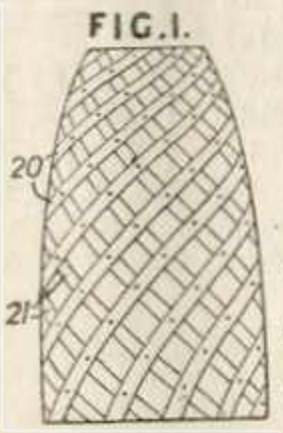
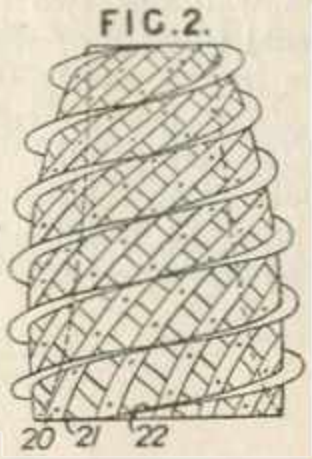


FIG. 2.



272,926. Siemens - Schuckertwerke Ges. June 19, 1926, [*Convention date*].

Heating air. — In air heaters composed of metal plates 1 separated by spacing strips 2^{I}, 2^{II} at the sides and 6^{I}, 6^{II} at top and bottom, flanges 7^{I}, 5^{I}, 5^{II} are provided on the plates which overlap the spacing strips. Further spacing strips 3^{I}, 3^{II} serve to guide the air and hot gases and the plates are built up into units by bolts pasing through holes 4. The units are placed in a box 12 and sealed against the side walls of the box by bars 9 forced against the edges of the units by springs 10. The units rest upon a grating at the bottom of the box so that their weight forces the flanges 5^{II} tightly against the strips 6^{II}, and a grating may also rest upon the top of the heater. A flue III is arranged between the units I and II and is controlled by a damper to bye-pass the hot gases when a lower temperature of the air is required. One of the side walls of the box 12 is detachable for removal of the units.

FIG.4.

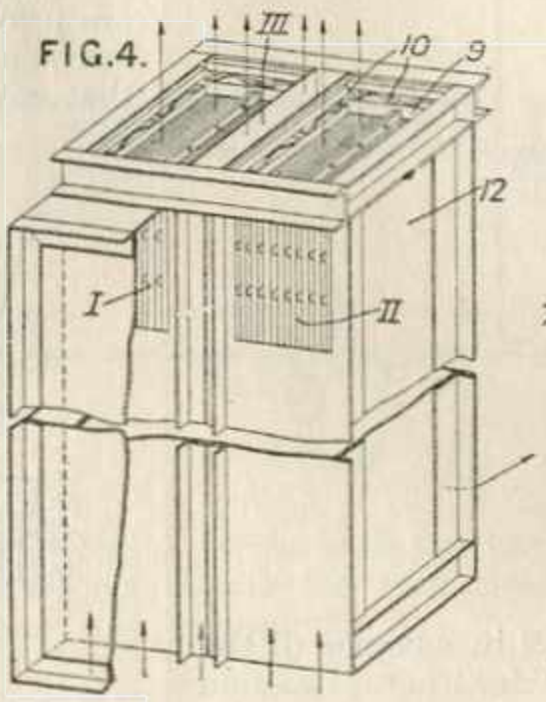
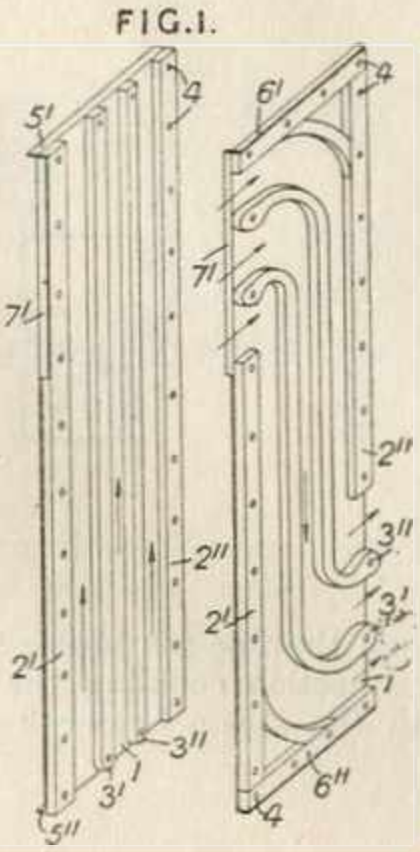
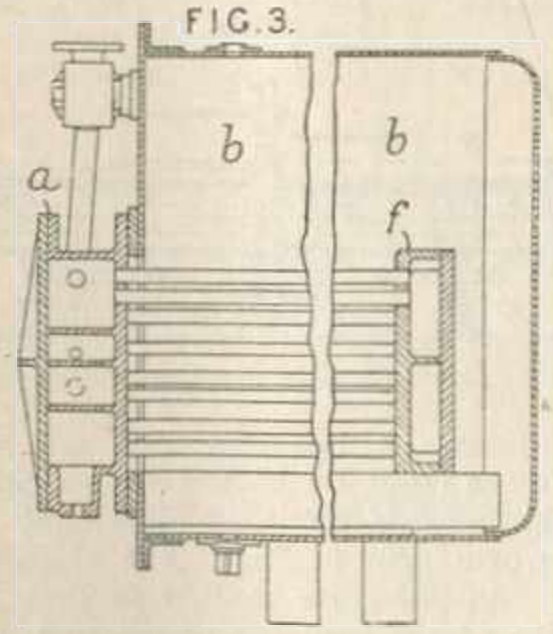


FIG.1.



273,113. Stephenson, B., and **Pearn & Co., Ltd., F.** Aug. 5, 1926.

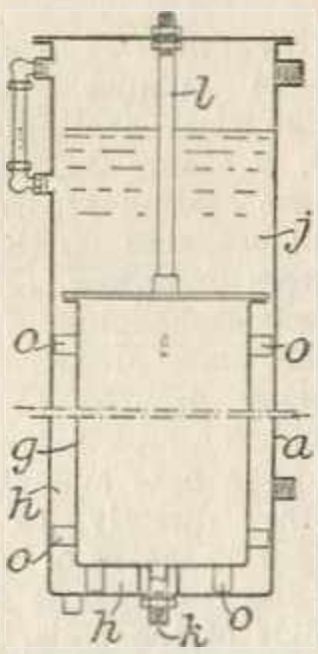
FIG.3.



Heating water.—A calorifier *b* is provided with two separate sets of tubes connecting a divided header *a* with a floating head *f*, one set being for live steam and the other for exhaust steam. The inlets and outlets for the two sets are connected to the header *a*.

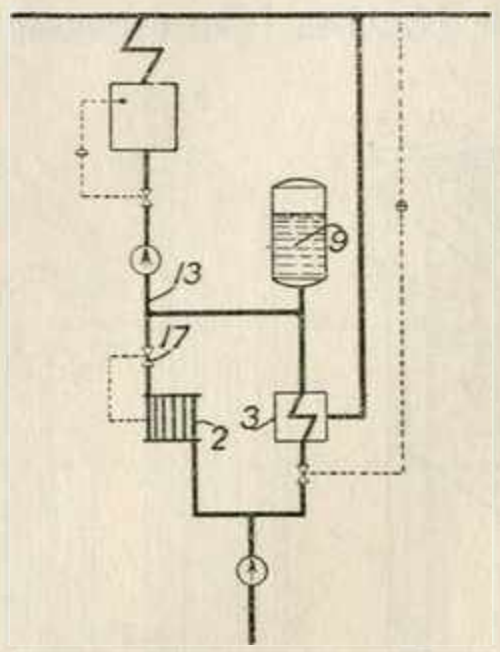
273,288. Hess' Fabrikker Aktieselskab, C. M. June 22, 1926, [*Convention date*].

Heating water. — A container *g*, through which water for a hot water supply is circulated, is fitted within an elongated cylindrical expansion tank *a* of a heating system, so that a thin water space *h* is left at the bottom and sides, the material volume of water *j* lying above the container *g*. The inlet and outlet pipes *k*, *l* may support the container *g*, guide-ribs *o* serving to space it from the wall of the tank *a*.



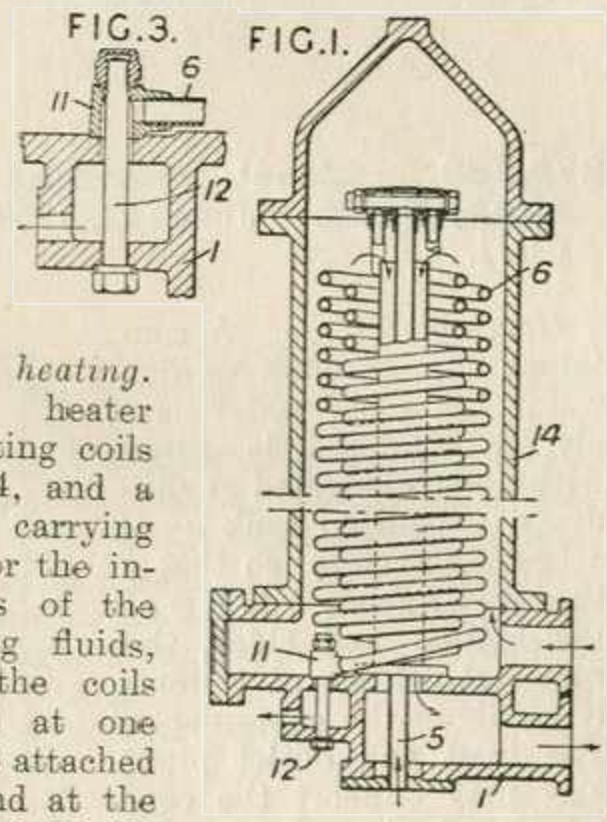
273,319. Siemens - Schuckertwerke Ges. June 23, 1926, [*Convention date*].

Feedwater, heating.—In a boiler feedwater system having flue-gas and steam feed-heaters 2, 3 in parallel connection and provided with a feedwater accumulator 9, the pressure of the feed in the flue-gas heater is maintained approximately the same as that in the accumulator, and a temperature-controlled valve 17 is fitted in the out-



flow from the flue-gas heater 2 in advance of the cross-connection coupling the feed-pump suction 13 with the steam heater 3 and the accumulator 9.

273,450. Hillier, H. May 26, 1926.

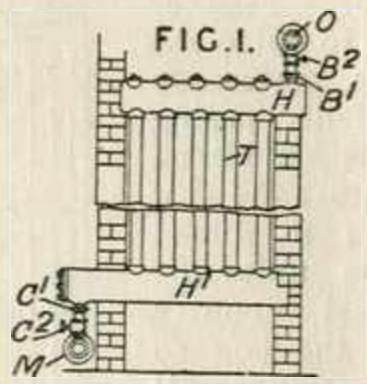


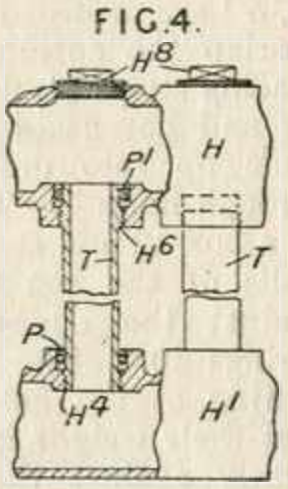
Feedwater, heating. — A tubular heater comprises heating coils 6, a casing 14, and a base casting 1 carrying all branches for the ingress or egress of the heat-exchanging fluids, the ends of the coils being secured at one end to a pipe 5 attached to the base and at the other directly to the base by means of hollow connecting pieces 11 permanently secured to the ends of the coils, a bolt 12 passing through the connecting piece and the pipe or base casting. Each connecting piece may be joined to two or more coils. Specifications 2584/99 and 20468/00, [both in *Class* 123, Steam generators], are referred to.

273,461. Addyman, W. P. June 8, 1926.

Feedwater, heating.—In a sectional feedwater heater wherein each section comprises upper and lower headers H, H¹ connected by tubes T, readily disconnectible unions B¹, C¹ and valves B², C² are provided between the headers H, H¹ and the hot and feed water mains O, M respectively, so that any section may be rendered inoperative and,

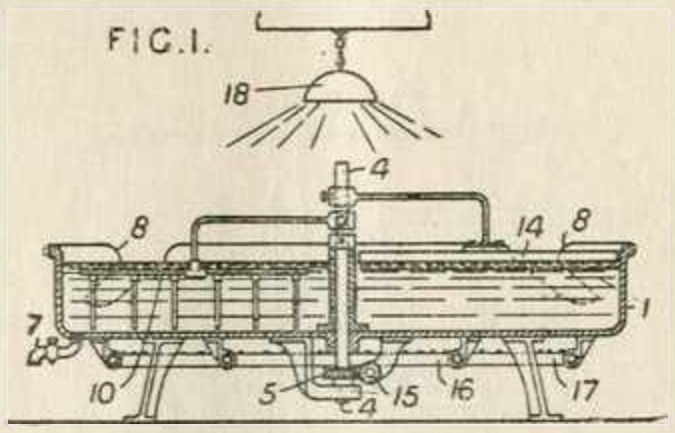
FIG.4.





if necessary, removed. The tubes T are screwed at both ends to engage threaded orifices H⁴, H⁶ in the headers, and are inserted or withdrawn through hand holes H⁸ in the header H, while fluid-tightness at the joints is secured by packings P, P¹. Specification 198,484 is referred to.

273,578. McKinlay, D. Dec. 14, 1926.

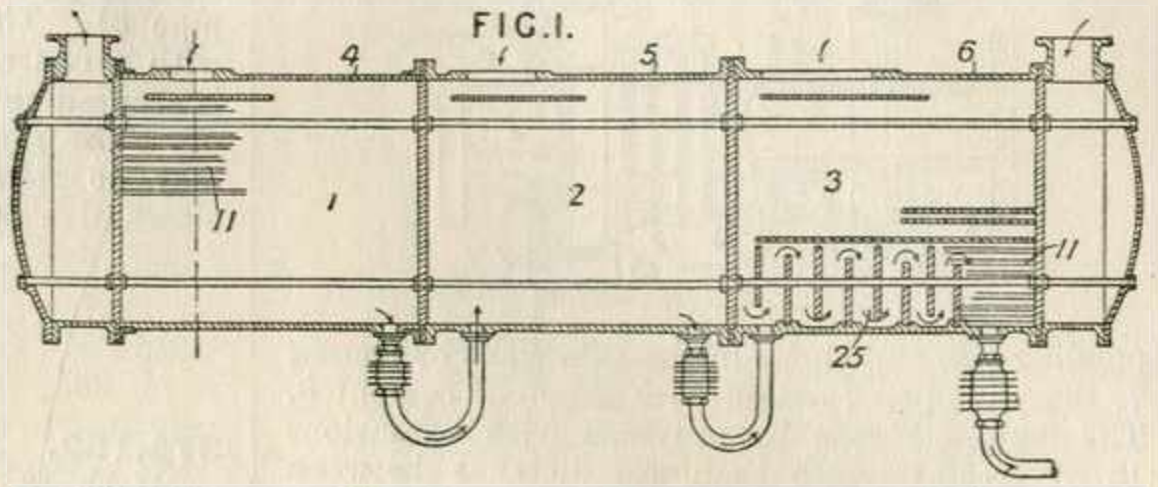


Boiling-pans.—A preserving pan 1 is heated by concentric gas rings 16, 17 and has a rotary stirrer 10 and skimmer 14 mounted on a shaft 4 driven through worm gear 5, 15. The skimmer 14 is vertically adjustable on shaft 4 so that it can be raised clear of the contents of the pan, and comprises a wood or metal bar the outer portion of which is curved so as to deflect the scum into overflows 8 on the pan 1. The pan has a discharge cock 7. One or more atmospheric quartz mercury vapour lamps 18 are provided above the pan. In other forms, the pan may be heated by a steam jacket or coils, or the pan may rotate, the skimmer and stirrer being fixed. To provide for automatic working, the charging may be effected by a conveyer or by receptacles which tip their contents into the pan.

273,803. British Thomson-Houston Co., Ltd., and **Samuelson, F.** April 7, 1926.

Feedwater, heating.—A feed-heater is constructed with a plurality of compartments 1, 2, 3 built in one continuous length, and each compartment may comprise an outer sheet 4, 5, 6 secured to the adjacent casings. The water tubes 11 are continuous throughout the length and steam from independent sources is introduced into the separate compartments at such temperatures as to heat the feed as it passes through the heater progressively from inlet to outlet. Condensate from one compartment is led to the next colder compartment, and in the coldest compartment 3 it is caused to pass over the feed-water tubes by a baffle arrangement 25.

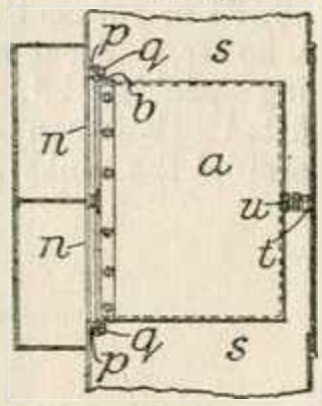
FIG. 1.



273,809. Owen, W. H. April 8, 1926.

Heating air. — In air-heaters of the plate-type comprising bundles of cells *a*, the joint between the aperture *n* in the casing of the flue *s* and the bundles is effected by the use of an angle-iron frame *b* and asbestos or other packing *p*. The joint may be compressed by means of bolts *q* along the frame or by means of pressing screws *t* bearing on bars *u* for distributing the pressure.

FIG. 1.



273,886. Young, J. W., and **Metropolitan-Vickers Electrical Co., Ltd.** June 16, 1926.

FIG. 1.

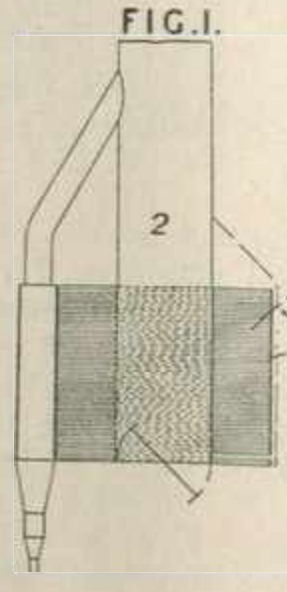


FIG. 3.

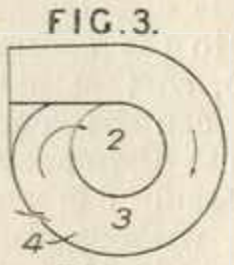
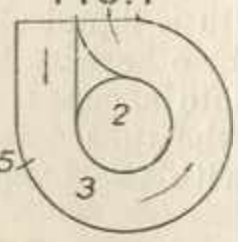
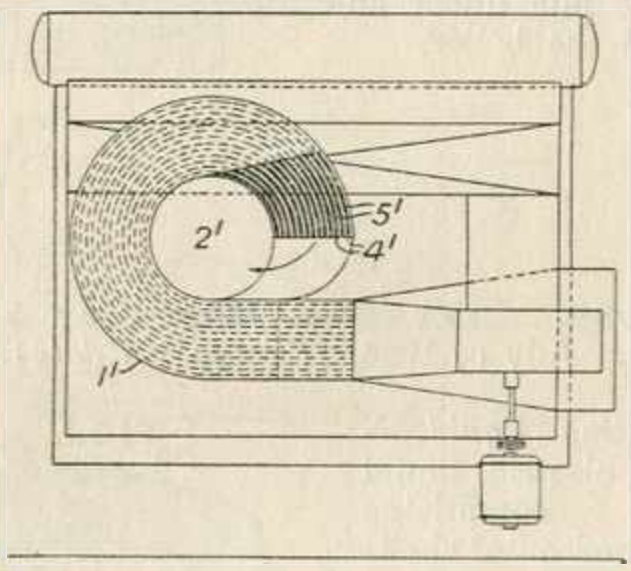


FIG. 4.



Heating air.—An air heater comprises a substantially cylindrical casing 1 disposed about a central flue 2 and divided by partitions 3 into a series of chambers of substantially annular form, alternate ones 4, Fig. 3, of which each communicate with the flue and a conduit external to the casing, the others 5, Fig. 4, each communicating with fluid inlets and outlets in the outer walls of the casing. The fluids pass through the chambers in a substantially circular path, and preferably in counter-current. In a modification, Fig. 7, the series of chambers 4^1, 5^1 extend lengthwise of the flue 2^1 with the casing 1^1.

FIG. 7.



273,889. Green, D. C. L. June 22, 1926.

Feedwater, heating.—A straight economizer tube 1, with or without fins 12, is provided, in addition to the ordinary integral flanges 2 for attachment of bends, with additional flanges 5 near the ends which fit into holes 6 of corres-

FIG. 8.

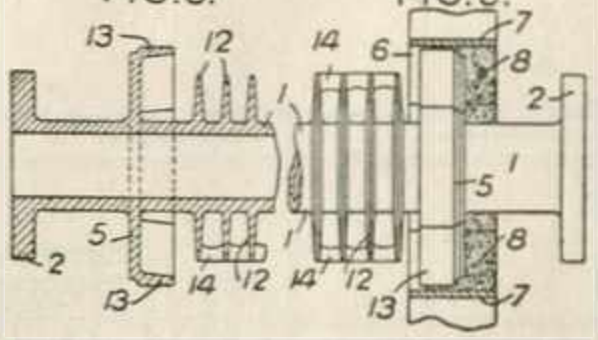


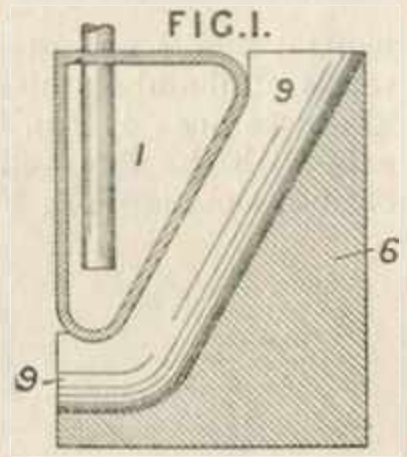
FIG. 9.

ponding size and shape in the side walls or frames 7, the joint being sealed with fireproof cement 8. The flanges 5 may be provided with extensions 13 of greater width than the distance between gills 12, and the gills themselves may have filling pieces 14 extending between them to form a flat sliding surface.

273,954. Taylor, T. W. Nov. 24, 1926.

Block-form boilers.— A hot-water boiler of substantially triangular section rests on the sloping face of a single firebrick 6 constituting a support and backing, the face being intersected by a channel 9 to form a flue under and behind the boiler.

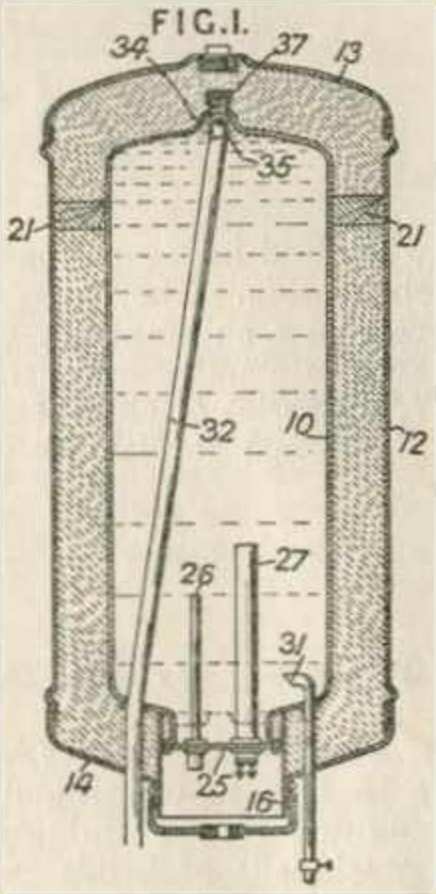
FIG. 1.



274,089. Akt.-Ges. Kummler & Matter. July 6, 1926, [*Convention date*].

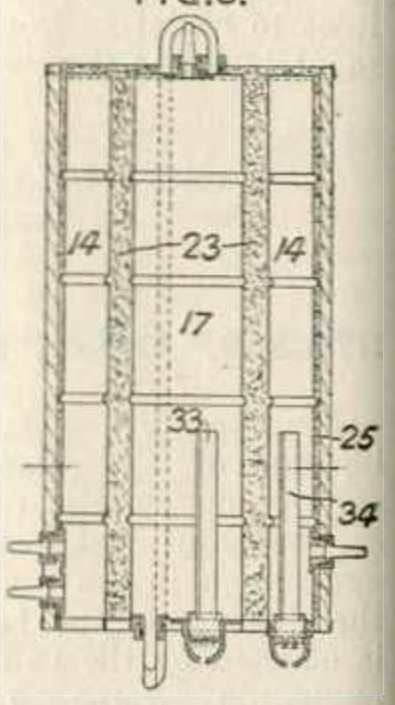
Heating liquids.— In an electric liquid heater comprising inner and outer shells 10, 12, which may be of sheet metal, separated by heat-insulating material, the inner shell is supported at its lower end by a cylinder 16 of heat insulating material fixed to the outer shell, and the hot water discharge pipe 32 passes through the shells externally of the cylinder. The member 16 may comprise a short tube 16 of wood or insulated metal. Insulating blocks 21 secured to the upper end of the outer shell keep the inner shell in the correct position. The inner shell is provided at the lower end with an inlet pipe 31. The inner shell is formed at the top with a central dome-shaped portion 34 to which is secured an outlet pipe 32 with side inlet orifices 35. The pipe 32 is fitted with a cap 37 which may be removed to provide a supplemental or alternative outlet.

FIG. 1.



274,152. Jones, T. M., and **Sutcliffe, H.** March 13, 1926.

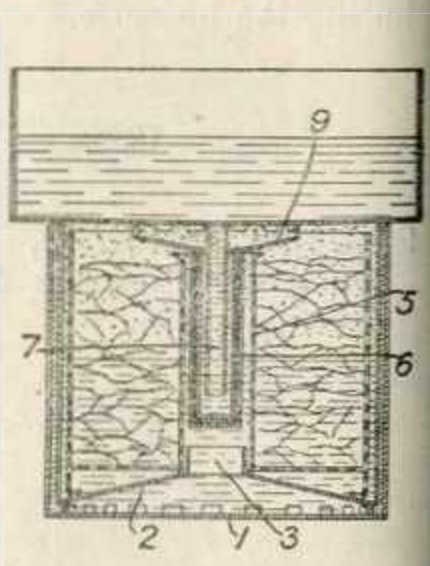
FIG. 3.



Heating water. — Two or more tanks or containers 14, 17 disposed one within another, and connected in series, are each provided with separate heating means, for example electric heaters 33, 34 or connections to a boiler. Heat-retarding packing 23, 25 is fitted between and around the tanks.

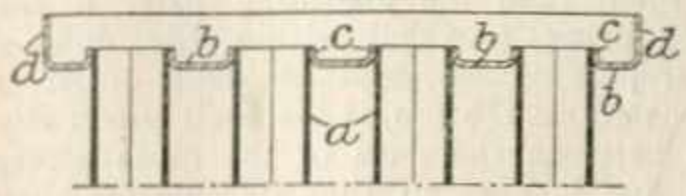
274,855. Eisenbeiss, E. July 22, 1926, [*Convention date*].

Washing - boilers. — In apparatus producing a periodical circulation of liquid, for example in washing clothes &c., a mixture of steam and liquid rising from the heated bottom 1 is directed by a cone 2 to the central tube 3, 5, so that part at least can be conducted into the space where steam can be given off, without obstruction by the clothes &c. to be washed. A central drip-pipe 7 communicating with a liquid chamber is surrounded by a jacketed or otherwise insulated tube 6 opening at the top into a coned plate 9 so that the sealing liquid in the tube 6 is protected from heating or contact with the steam or liquid rising in the tube 5.



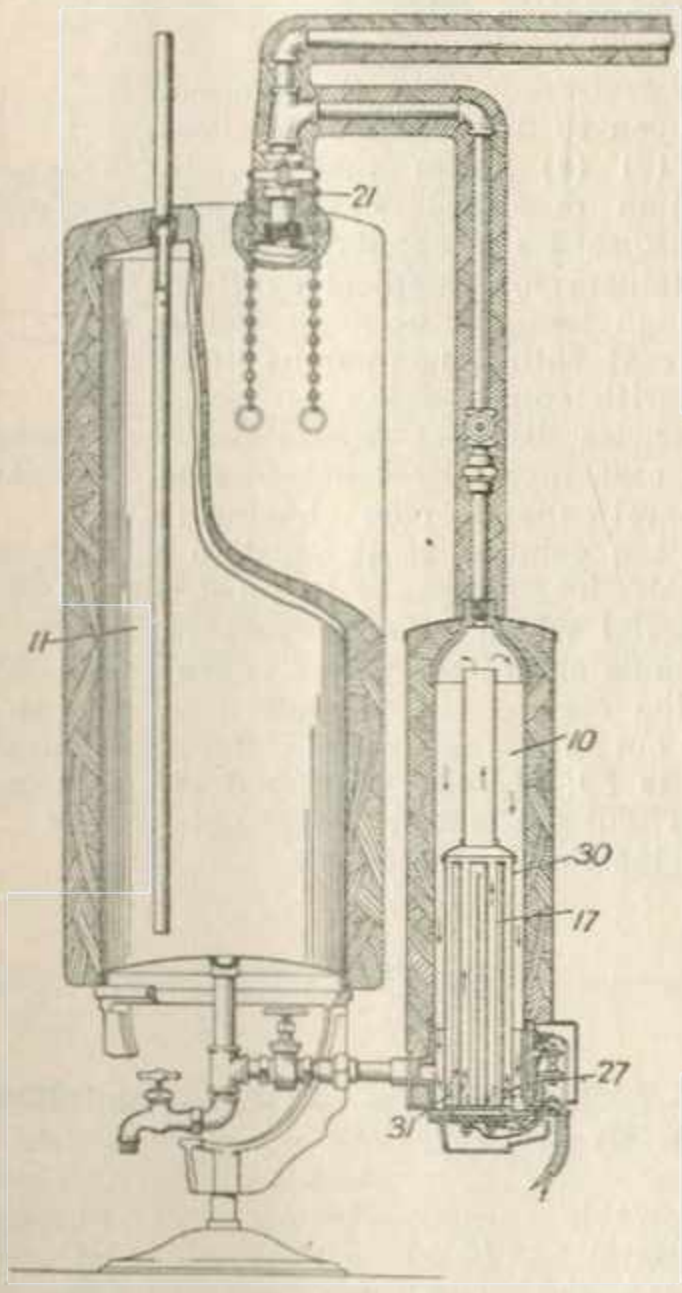
274,906. Hartmann, P. E., (Assignee of *Hartmann, M. & E.*). July 24, 1926, [*Convention date*].

FIG.2.



Heating air.—To secure and reinforce the edges of plates *a* in an air heater a stamped plate *b* is employed extending over several pairs of plates and provided with apertures with upturned edges *c* into which the pairs of plates fit and are secured by welding. Adjacent units thus formed can be secured by the flanges *d*.

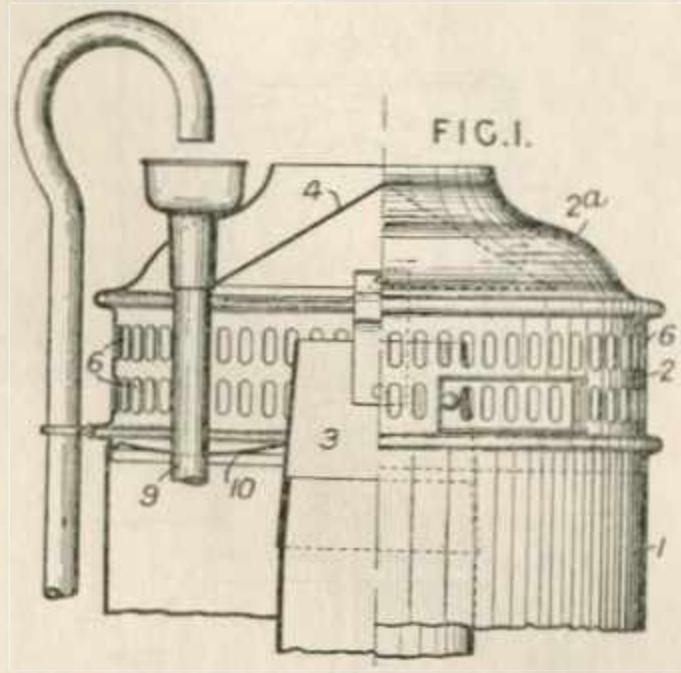
274,956. Kercher, A. J., and **Hicks, W. W.** April 28, 1926.



Heating liquids.—In a liquid heating system employing interconnected tanks 10, 11, a thermostat 27 controls the heating of a small or a relatively large quantity of liquid according to whether liquid is to be drawn from the tank 10 only or from the top of the tank 11. The circulation between the tanks may be arrested by means of a valve 21. The tank 10 is fitted with an electric heater 17.

275,074. Davis, W. J., and **Davis Engineering Co., Ltd., W. J.** Jan. 1, 1927.

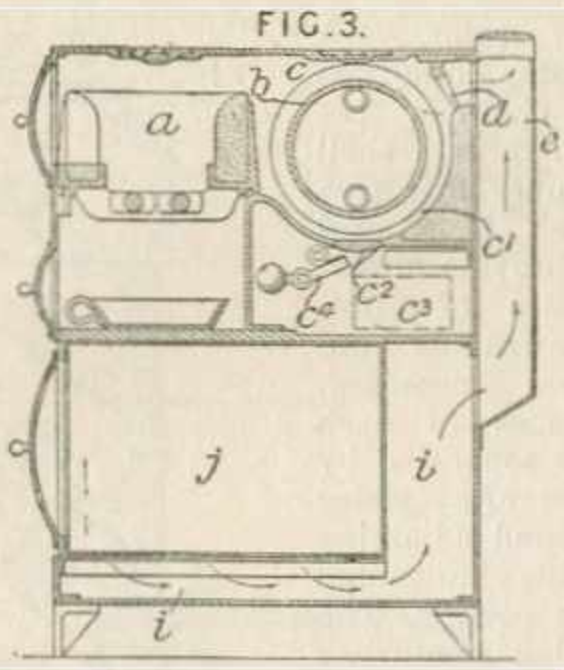
FIG.1.



Geysers.—The upper part of a geyser is formed to prevent down-draught with a chamber 2 partitioned from the main shell 1, the chamber 2 having a baffle 4 disposed above the connection 3 with the main shell and having a number of air-inlet holes 6 arranged around it. The chamber may be separate and fit into the top rim of the outer shell 1. A water-inlet pipe such as 9 passes through the cap 2^a of the chamber 2 and through the annular partition 10.

275,311. Thompson, T. May 3, 1926.
Addition to 235,308.

FIG.3.



Heating water.—The range described in the parent Specification is modified by arranging the firebox *a* and boiler *b* transversely of and making them of substantially the same width as the range. An additional chamber *k*, Fig. 4, traversed by the hot gases under control of a damper d^1, is arranged above the main boiler *b* and fitted with an oven, hot closet, or a second boiler *l*. The boilers *b*, *l*, which are preferably cylindrical and furnished with external gills, are either connected in series or independent, so that two separate supplies of hot water are available. The second boiler *l* may be constructed as a calorifier, in which case the gilled outer chamber *n*, Fig. 5, receives water, for use in a radiator

system, from the main boiler *b*, which water is further heated by the fire gases and serves to

FIG. 4.

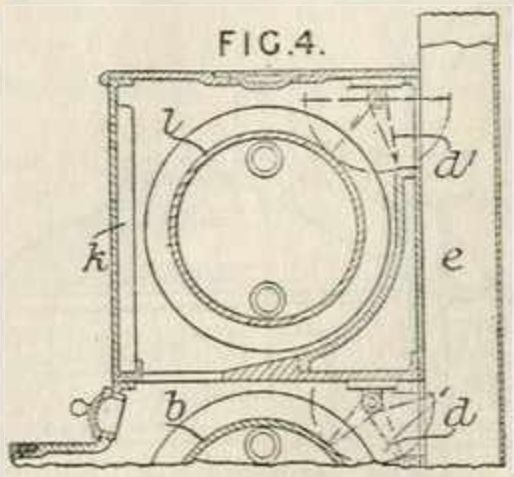
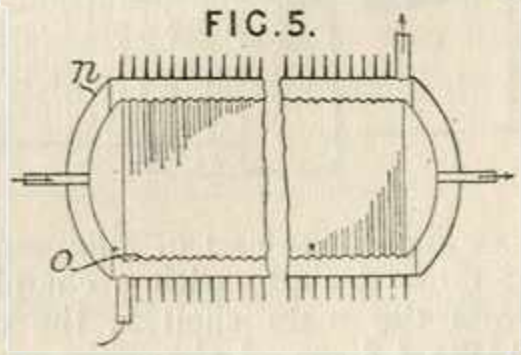


FIG. 5.

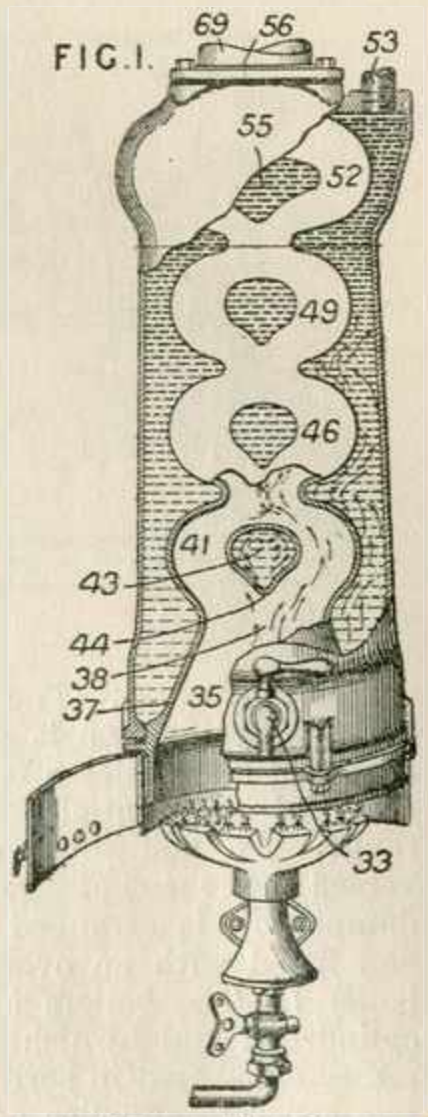


heat an additional supply, for domestic purposes, passing through the inner corrugated chamber *o*.

275,425. Dehn, F. B., (*Dunham Co.*). Aug. 28, 1926.

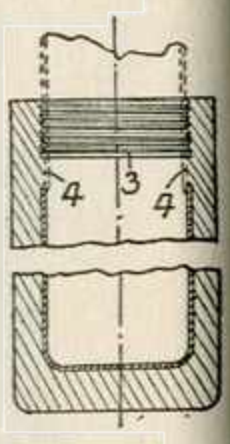
Heating water. — A water heater comprises a water chamber between an outer shell and an inner flue portion which is shaped so as to provide superposed pairs of outwardly protruding convolute gas passages, the passages of each pair being separated by open-ended cross water passages, and adjoining pairs being connected by a neck portion. The flue casting comprises a tapering combustion chamber 35 with flattened side walls 37 terminating in a throat 38 considerably above a water supply pipe and a draining faucet 33 on the outer shell. The flue divides above the throat 38 into two convolute passages 41 separated by a cross water passage 43 communicating with the surrounding water space and providing a ridge-shaped baffle 44. A series of further convolute flue

FIG. 1.



passages 46, 49, 52 leads to a throat 56 extending through the shell and accommodating the lower end of a stack 69. The cross-sectional area of the convolute passages decreases progressively upward and the uppermost pair are more widely divergent than the preceding pair, a reservoir space being provided within the dome-shaped upper part of the shell. A water outlet pipe 53 is located on the top of the shell preferably midway between the ends of the cross passage 55. The flue is cast so that its interior surface is rough in order that moisture in condensing in the upper portion is caused to spread and be evaporated. In a modification (Fig. 11, not shown) the flue comprises two series of pairs of gas passages, the adjacent passages of each series merging into each other and a third series of cross water passages being formed in staggered relation to the water passages on each side.

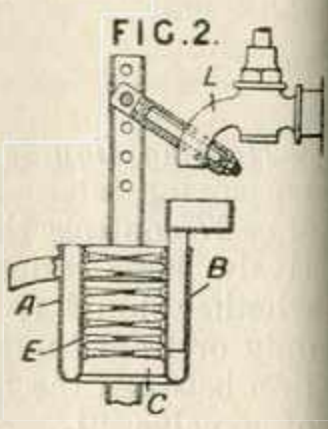
275,621. Galassini, E. Aug. 4, 1926, [*Convention date*].



Digesters. — The Specification as open to inspection under Sect. 91 (3) (a) states that the invention described with reference to projectiles is applicable also to containers for chemical synthesis at high temperature :—Projectiles are cast with a non-porous lining or with one having properties otherwise different from those of the cast metal by employing an integral metal core having a melting point at least equal to that of the cast metal. The core may be filled with a refractory material which is afterwards removed. In the example shown the part 4 is removed subsequent to the casting and threads 3 to receive a fuse and cut in the cast metal. Specification 4966/93, [*Class* 83, Metals, Cutting &c.], is referred to. This subject-matter does not appear in the Specification as accepted.

275,756. Hudson, J. J. C., and **Hudson, G. C.** June 7, 1926.

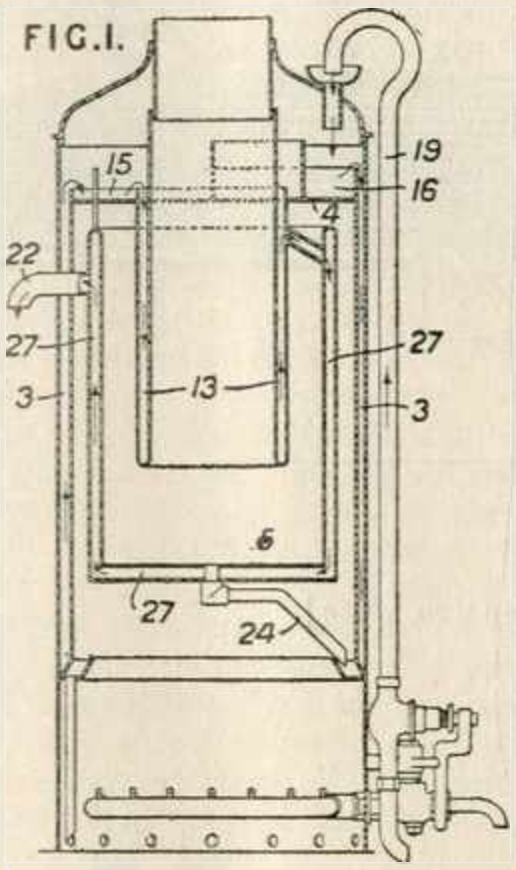
FIG. 2.



Portable water-heaters: slab-form boilers. — A water-heater comprises a narrow, flat, substantially vertical chamber one wall of which has fixed therein a series of separate solid heat-conducting pins projecting into the path of the hot gases from a burner. Two such chambers A, B are placed so that the pins

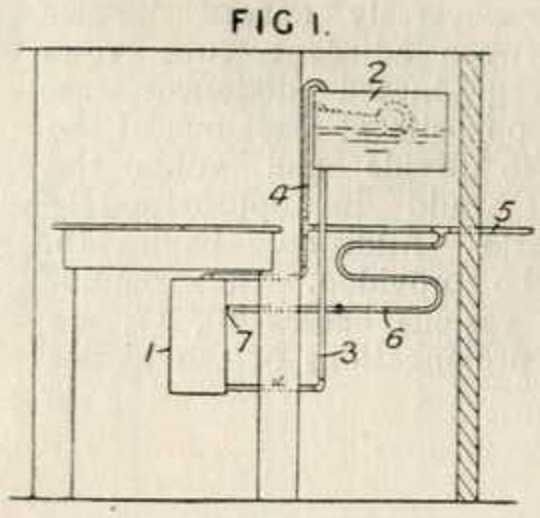
E project into the space C between them in the hot gases rising from an attached gas burner. The appliance is suspended so as to be swung under or away from a tap L. Specification 242,700 is referred to.

275,837. Stiles, H., and **Aldershot Gas, Water & District Lighting Co.** Nov. 17, 1926.



Internally-fired boilers.—Water fed by a pipe 19 into the deeper part 16 of a divided tray 4 overflows therefrom to the hollow shell 3, returning over the shallower compartment 15 to a central annulus 13 and thence flowing to the boiler proper 27 and the outflow 22. An outlet 24 for condensation formed in the space 5 is provided.

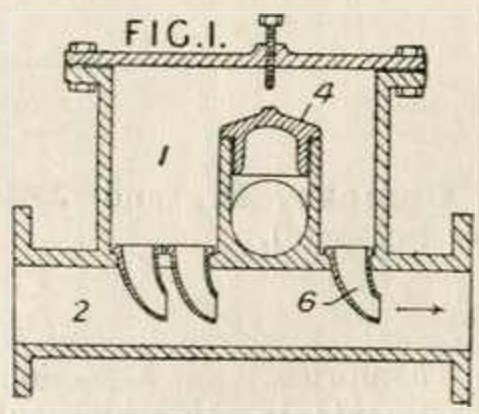
275,853. Cornes & Haighton, Ltd., and **Cornes, J.** Dec. 30, 1926.



Heating water.—In a hot water supply system of the kind in which the hot water cylinder is omitted, and the expansion pipe delivers into the top of a float-controlled tank, the boiler 1 is provided with an expansion pipe 4 delivering into the tank 2 which supplies cold water through a pipe 3 to the bottom of the boiler. Hot water is drawn off through a pipe 5, and a pipe coil 6 connects the pipe 5 to an intermediate point 7 in the boiler. In a modification, the expansion pipe is also dispensed with and the tank 2 arranged on the same level as the boiler so that the latter cannot be completely filled.

275,876. McKinley, W. G., and **Savage, B.** Feb. 21, 1927.

Feedwater, heating.—In heaters arranged so that a portion of the hot feed is returned to mix with the entering cold water, the heated water is introduced into the cold-water pipe 2 through a nozzle or nozzles 6 projecting in the direction of flow. The hot water may be admitted to the chamber 1 through a non-return valve 4 having a controlled variable lift.



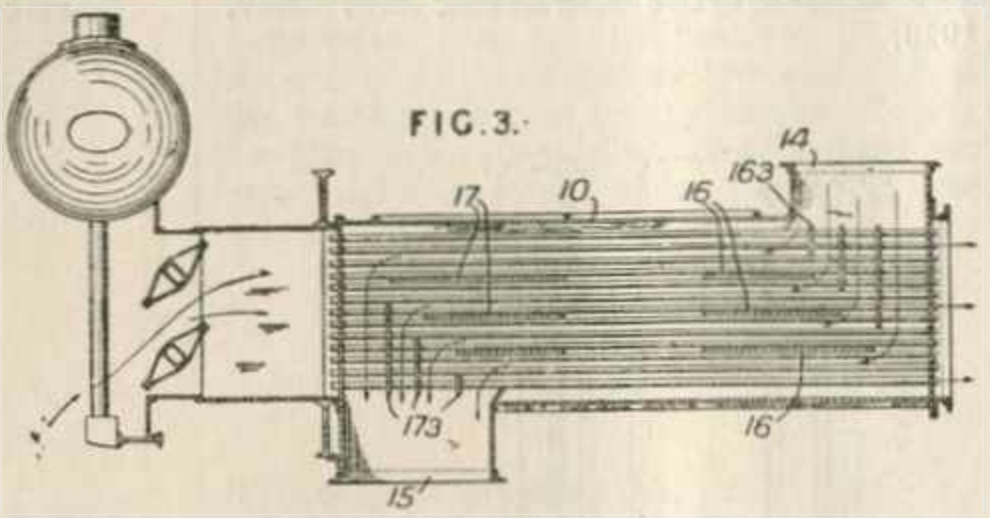
276,209. Dodds, G. E. Dec. 9, 1926.

Washing-boilers. — A casing for portable domestic boilers is made in two sections, flanged at their meeting edges from top to bottom, one flange of each joint having bolt holes and the other corresponding slots.

276,262. Babcock & Wilcox, Ltd., (*Babcock & Wilcox Co.*). March 22, 1927.

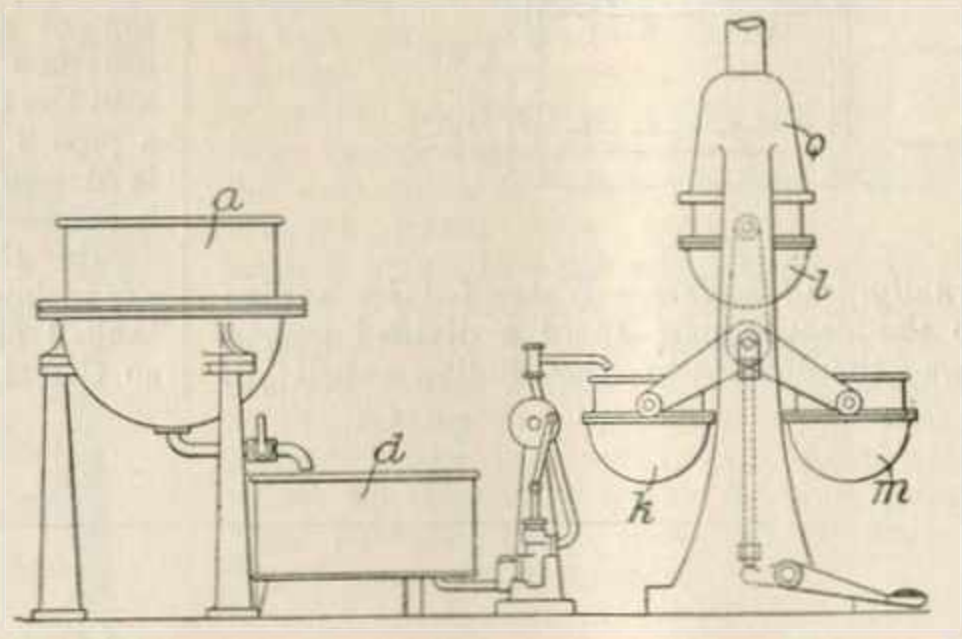
Heating air.—The casing of a heat exchanger has vertically separated inlet and outlet openings 14, 15 and parallel transversely spaced baffles 16, 17 between adjacent tube rows extending graduated distances into the region opposite at least one of the openings to divide and guide the stream of fluid in approximately parallel paths. Additional baffles 16, 17, may be provided. In a modification the various baffles 16, 17, are made as prolongations of the baffles 16, 17.

FIG. 3.



276,563. Berten & Co., Ges. Nov. 12, 1926, [*Convention date*].

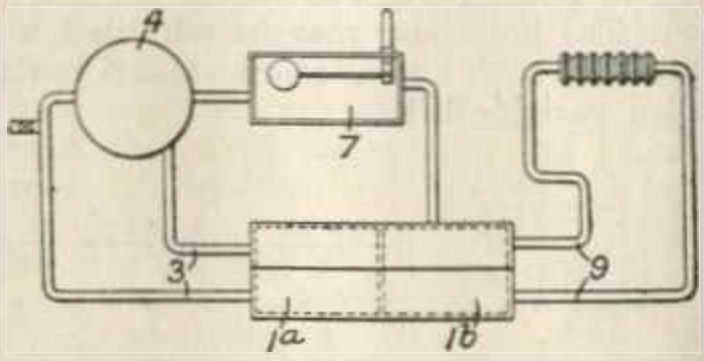
Boiling-pans.—Each of a set of boilers *k*, *l*, *m*, containing sugar solution is brought under a vacuum hood Q in turn by rotation of the mounting.



276,565. Comery, B., and **Duckering, G. F.** Feb. 12, 1927. *No Patent granted* (*Sealing fee not paid*).

Heating water: compound boilers.—A hot water sytem comprises an L-sectioned boiler having compartments 1*a*, 1*b* which supply independent circuits 3, 9 for domestic supply and heating systems respectively. The domestic supply circuit is provided with a cistern 4 which is supplied with water from a tank 7; this tank also supplies the boiler compartment 1*b*.

FIG. II.



276,761. Tansley, G. E. June 14, 1926.

Heating air; heating water.—In air or water heaters used in connection with furnaces, and having narrow plate elements through which the air or water passes and around which hot gases flow, the outer sides of the elements are provided with baffles for collecting grit or dust and allowing them to fall to a soot chamber. The elements may be flat or curved or of truncated cone shape, arranged around a central conduit or flue. Fig. 1 shows flat elements B having inlet and outlet openings D, E and arranged within a casing A around a central conduit C which may act as a bye-pass for hot gases admitted at F, valves J, K, L regulating the passage of the gases, either between the elements B or through the conduit C, to the outlet G leading to the chimney. Baffles N which may by of triangular or curved shape as shown are arranged on both sides of each element in a zig-zag manner and soot &c. which collects on the baffles falls to a soot chamber I. The elements may be curved and may be arranged so that the whole of their horizontal axes are equidistant throughout their width instead of diverging. Figs. 4 and 6 show truncated conical elements arranged one over the other and having a partition M from the centre to one edge separating the air or water entrance D and hot gas exit G from the air or water exit E and hot gas entrance F, so that the media travel completely around and between the elements. Baffles N, Fig. 6, intercept the hot gases and the soot &c. collected falls down the slope of the elements to the soot chamber I. Strips or projections may be arranged inside the elements to facilitate the heat transfer.

FIG. 4.

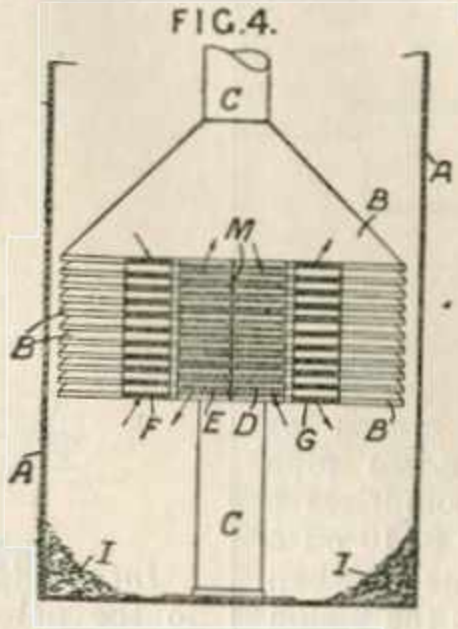


FIG. 6.

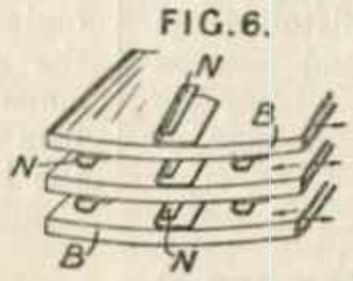
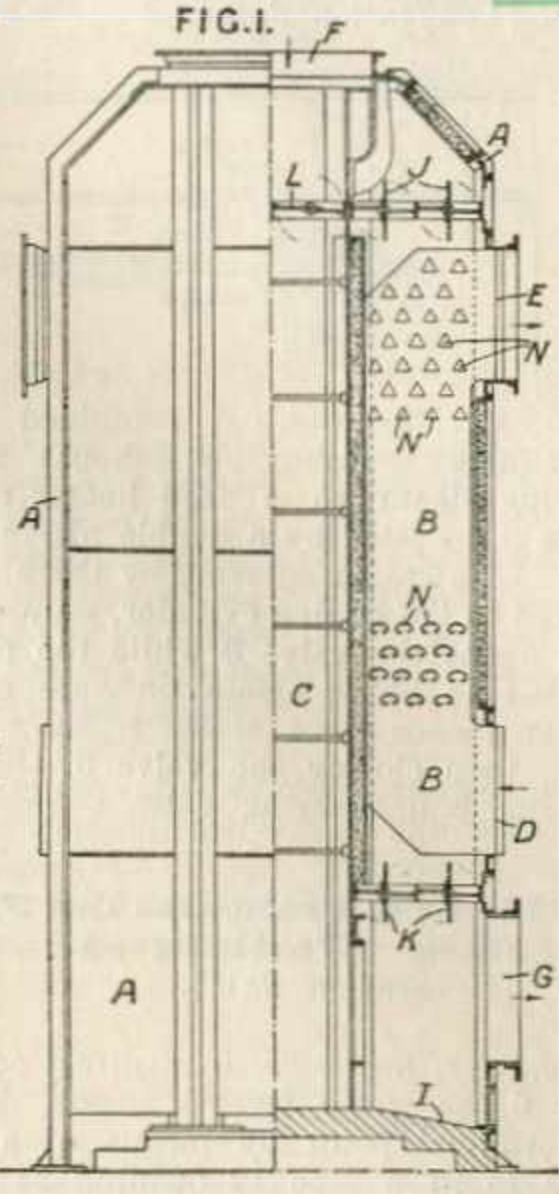


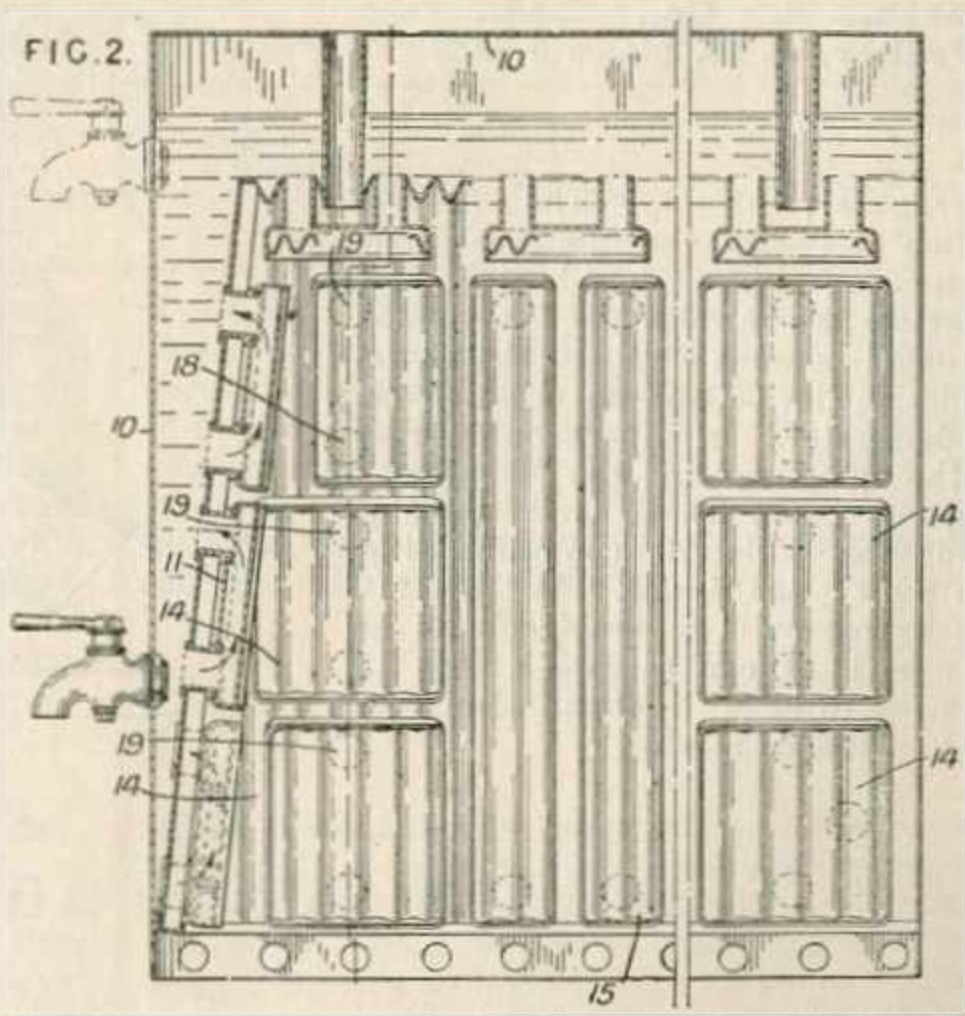
FIG. 1.



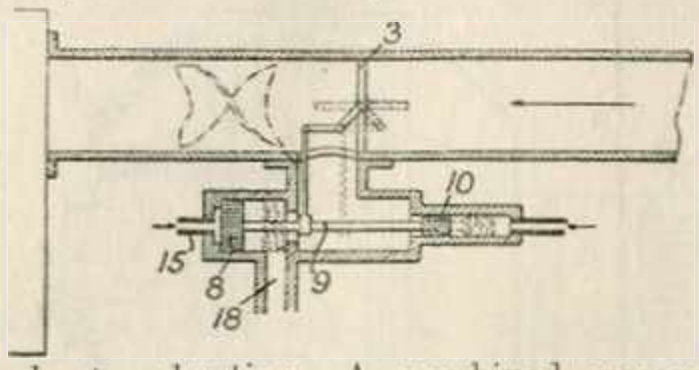
276,807. Lambert, A. J., and **Lambert Heater & Engineering Co., Ltd.** July 27, 1926.

Boilers; heating-surfaces, increasing.—A liquid heating device comprises a vessel 10 having a re-entrant bottom 11 rising to near the level of the liquid and having longitudinal corrugations and a plurality of shallow cells 14 substantially covering the surface of the bottom but spaced away from it and communicating with the interior by pipe connections 18, 19. The outer faces of the cells may be corrugated and the cells may extend the full height of the bottom as at 15.

FIG. 2.



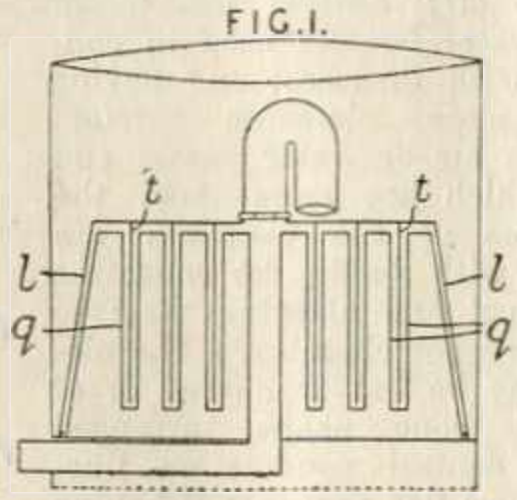
276,912. Soc. Française des Pompes et Machines Worthington. Dec. 15, 1926, [*Convention date*].



Feedwater, heating.—A combined means for closing and draining an exhaust steam pipe supplying steam to a feed heater comprises a throttle 3 operated by a double piston 8, 10 on a rod 9. Live steam entering by the pipe 15 when admitted to the engine cylinder, moves the piston 8 and opens the valve 3 while the piston 10 is subjected to boiler steam pressure and acts as a return means when steam is cut off from the engine, then closing the valve 3, the return of the piston 8 uncovering a drain port 18.

276,924. Zeitlin, H. May 5, 1927. *Addition to* 223,780.

FIG. 1.

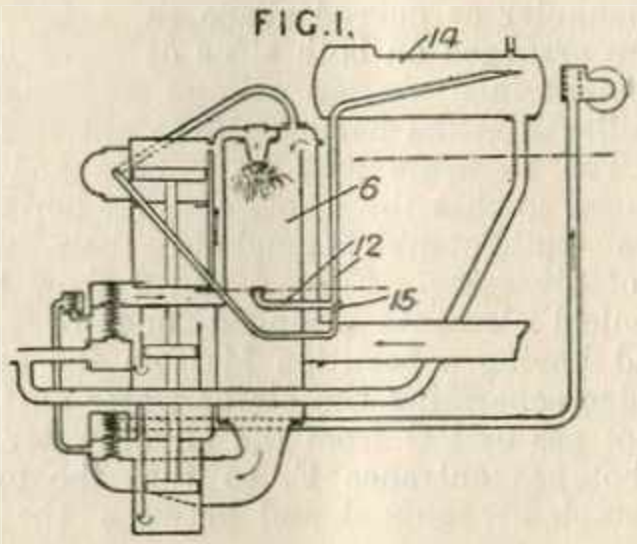


Internally-fired boilers.—The boiler according to the parent Specification is modified by the omission of the inwardly projecting vanes and the ribs on the outlet pipe. In the preferred construction depending concentric water-chambers *q* replace the vanes, partitions *t* secured to the hood *l* extending within the chamber *q*.

276,933. Soc. Française des Pompes et Machines Worthington. April 26, 1927, [*Convention date*].

Feedwater, heating.—In a direct contact feed-heater 6 the water level is kept down to a predetermined point by means of a live-steam ejector 15 in a pipe 12 opening at the correct height and delivering any water above that level to a receiver 14 mounted above the water level in the tender. In a modification the pipe is within the condenser and the receiver is formed by another compartment of the same casing. Specification 278,267 is referred to.

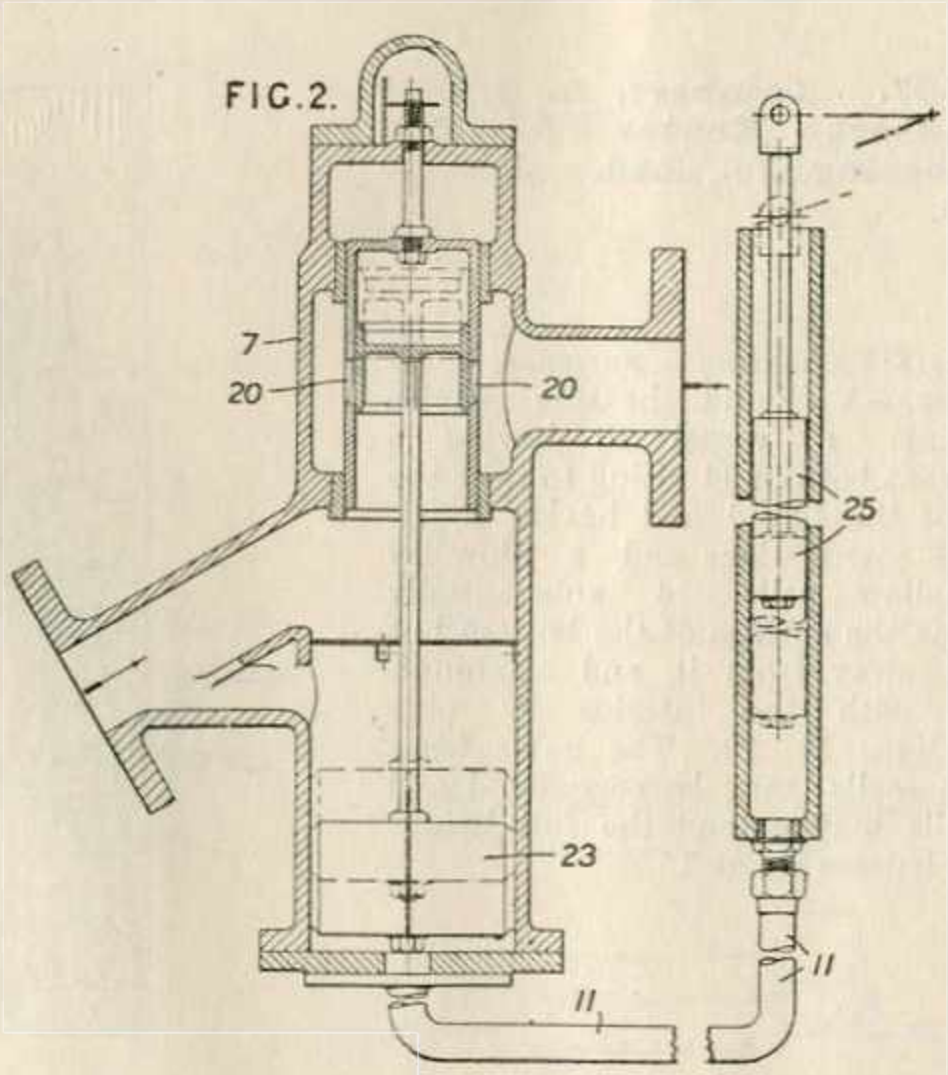
FIG. 1.



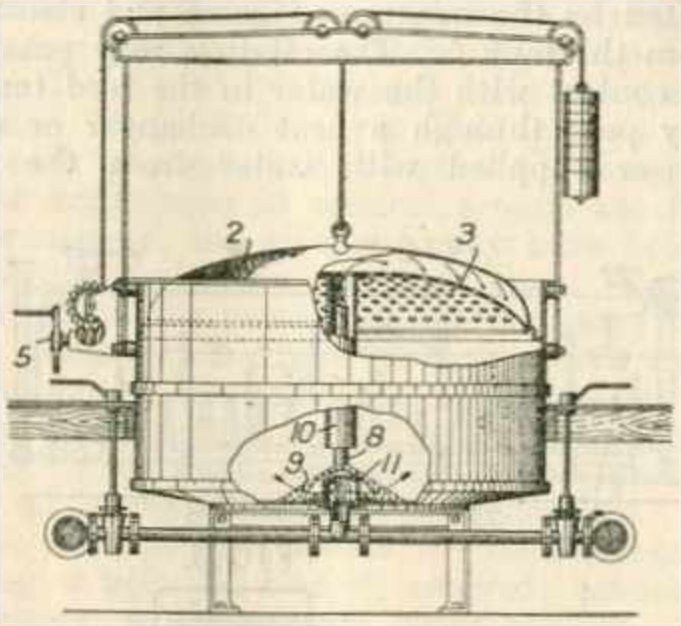
277,041. Richardsons, Westgarth, & Co., Ltd., and **Walker, J. R.** March 9, 1926.

Feedwater, heating.—The desired relation between the pressure and temperature in a feed-heater and de-aerator is controlled by a regulator 7 situated between a vapour abstractor or suction device and an outlet from the de-aerator. In operation a rise in the pressure in the de-aerator causes a piston 23 to fall thereby closing the ports 20 communicating with the suction device. At the same time by means of a liquid column in the pipe 11 it can actuate a float 25 operating to close a steam-admission valve on the de-aerator.

FIG. 2.



277,163. Valet, E. C. H. Aug. 25, 1926.

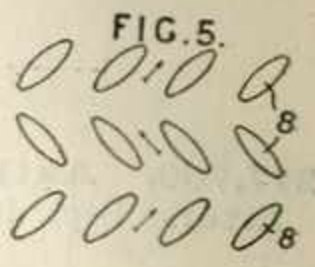


Digesters.—A digester for use in extracting pure cellulose from the bagasse of sugar core comprises a counterpoised cover 2 operated from a hand-wheel 5, and resting on a movable perforated inner cover 3 arranged to rest on the bagasse. This cover carries a depending pipe 10 through which the liquid is carried by steam entering at the bottom of the digester through a perforated hood 11 and passing upwards through a pipe 8, the liquid passing back through the perforated inner cover and re-entering the pipe 8 through a perforated conical member 9.

277,247. Vérel, J. T. R. April 19, 1927.

Heating air. — An air heater comprises a chamber between two walls of which a series of tubes extend, each having two opposite sides of flattened form, the walls being apertured to correspond with the ends of the tubes, and a flue leading from a furnace. Either the hot gases or the air may pass through the tubes, the other gas passing outside the tubes in approximately stream line flow. The tubes 8 may be arranged with their long axes parallel or as shown in the Figure.

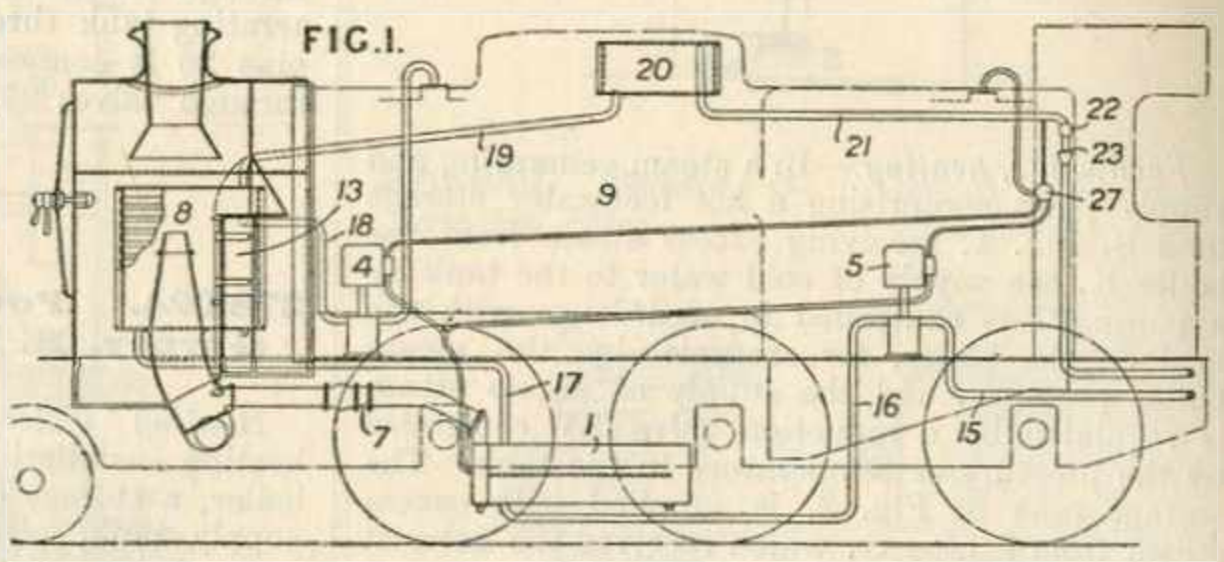
FIG. 5.



277,401. Bredin, E. C., and **Burnell, A. G.** Jan. 21, 1927.

Feedwater, heating. — In a feedwater heater for locomotive &c. boilers in which two pre-heaters 1, 8 heated by exhaust steam from the cylinders and by the flue gases from the boiler 9 respectively are provided, the supply of water to the heaters is positively maintained, and provision is made for the removal of any gases liberated during heating. The water is caused to flow from the main supply tank through pipes 15, 16 to the heater 1 by a pump 5, and thence through a pipe 17 to the heater 8 from which it is forced by a pump 4 through a pipe 18 to the boiler. Any excess of water supplied to the heaters, together with the liberated gases, pass to an auxiliary water tank 20 by means of a pipe 19, and thence through a pipe 21, pressure controlling valve 22 and sight-flow fitting 23 back to the main supply tank; a steam control valve 27 is provided so that no steam is supplied to the feed pump 4 until water is flowing through the valve 22. The supply of exhaust steam to the heater 1 is controlled by a valve 7, while the flow of flue gases through the heater 8 may be regulated by adjustable openings and doors 13 in the smokebox.

FIG. 1.



277,491. Willis, F. W. Sept. 15, 1926.

Block-form boilers.—A fireplace boiler 1 is fitted in a casing 2 which provides separate flues at the back and at one or both sides of the boiler, to which the gases from the fire pass beneath the raised bottom of the boiler. The casing is provided with a support 2^a for the boiler, partitions 5 which separate the flues and serve to position the boiler, and a damper 4 controlling the back flue. The side flues may be similarly controlled.

(*For Figures see next page*).

277,491.

FIG.1.

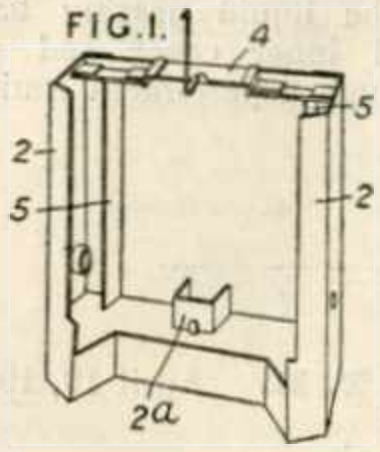
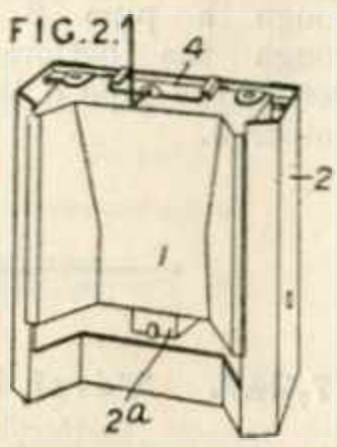


FIG.2.



277,706. Aktiebolaget Vaporackumulator. Sept. 20, 1926, [*Convention date*].

FIG.3.

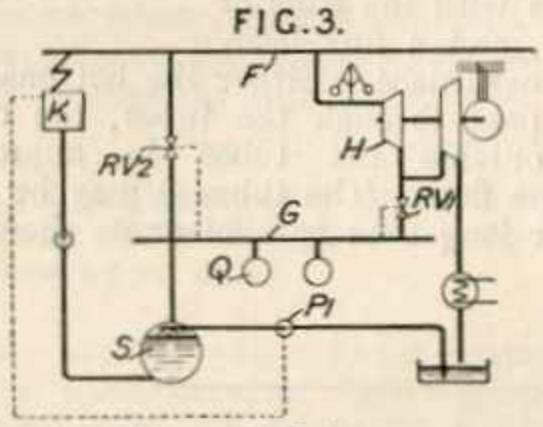
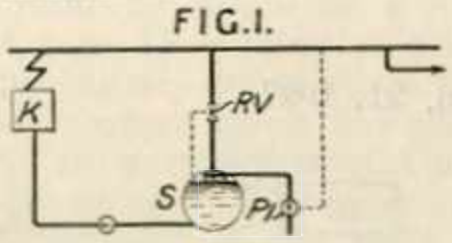


FIG.1.



Feedwater, heating.—In a steam generating and supply plant comprising a hot feedwater storage tank S, Fig. 1, receiving excess steam from the boiler K, the supply of cold water to the tank by a pump P1 is controlled in accordance with the load on the boiler, for example by the steam boiler pressure, and the supply of excess steam is regulated by a reduction valve RV controlled by the pressure or temperature in the tank. The storage tank S, Fig. 2, is supplied with excess steam from a pipe G, which receives the exhaust from the high pressure stage of a turbine H and which supplies steam to further consumers Q. When the cold water supply to the tank is increased, the consequent fall of pressure in the tank and in the pipe G causes the reduction valve RV1 in the exhaust conduit to open and increase the steam supply. Upon a further fall of pressure below a certain point, a second reduction valve RV2 is open to allow steam to pass to the tank directly from the main steam pipe F.

277,977. Perdrizet, P., and **Meyer, C.** Sept. 21, 1926, [*Convention date*].

Feedwater, heating.—Feedwater is heated in a feed tank 2, Fig. 3, and then passed through a tank 5 in which it is de-aërated and again heated by jets of steam. The water in the feed tank is heated by the mixture of gases and steam led off from the tank 5. The mixture may pass into direct contact with the water in the feed tank or it may pass through a heat exchanger or a jet condenser supplied with water from the feed

FIG.1.

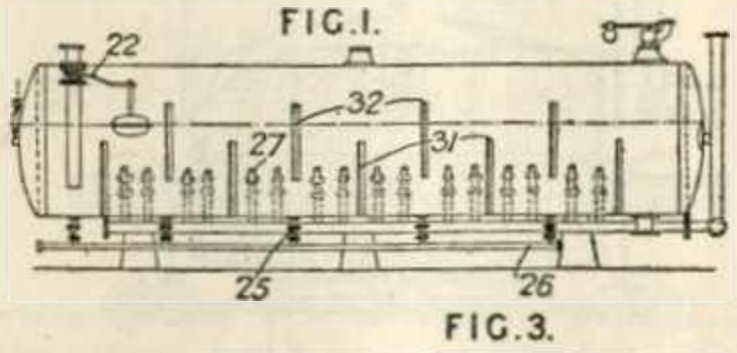
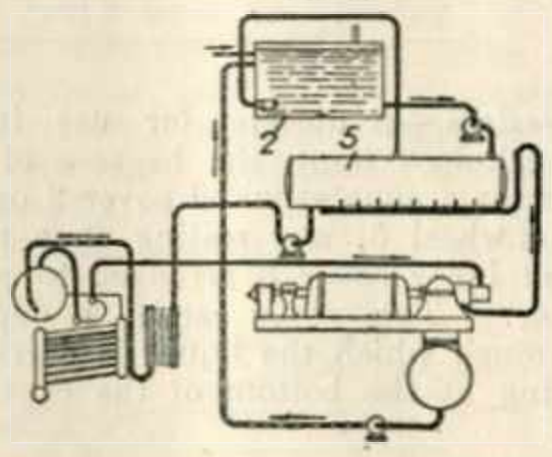


FIG.3.



tank. Exhaust or tapped steam is supplied to the de-aërating tank through nozzles 27, Fig. 1, arranged in pairs between baffles 31, 32, which direct the water in a zig-zag course in its passage through the tank. Water is supplied to the de-aerating tank through a float valve 22. A drain pipe 26 is connected to the bottom of the tank through valves 25.

278,024. Powell, E., Gough, J., and **Gurney, R. E.** March 17, 1926.

FIG.2.

Heating water. — A water-heating installation comprises a boiler, a storage cylinder, and a supply tank, electrical heating units being arranged integral with the storage cylinder *a* for alternatively or additionally heating the water. In the example the heating units are in the form of tubular stays *b* open at one or both ends and threaded to engage a boss *d* and a nut *c* on the walls of the cylinder. Specification 121,302, [*Class* 39 (iii), Heating by electricity], is referred to.

278,133. Tansley, G. E. Aug. 6, 1926.

Heating air; heating water.—In air or water heaters used in connection with furnaces of the type comprising hollow plate elements through

which tht air or water passes, and around which hot gases flow, the elements are pivoted around a chimney or flue. Each element 16 is constructed of two plates joined at their edges, openings 18 being left for the inlet and outlet of the air or water. Hooks 19 are provided on one edge 17 of each element and adapted to engage holes 20 in angle-irons 21 secured around the flue 22; alternatively, the elements may have holed lugs engaging pintles on the angle-irons. Baffles 24, 25 regulate the passage of the hot gases between the elements, the flue 22 acting as a bye-pass. Surrounding the casing 28 of the heater at the exit of the heated air or water is a hollow ring 29 connected with a fan or pump for drawing the air or water through the elements. A gas-tight joint at the mouths of the elements comprises a bolt 31, Fig. 6, secured between the elements, against which bears packing 33 re-

FIG. 1.

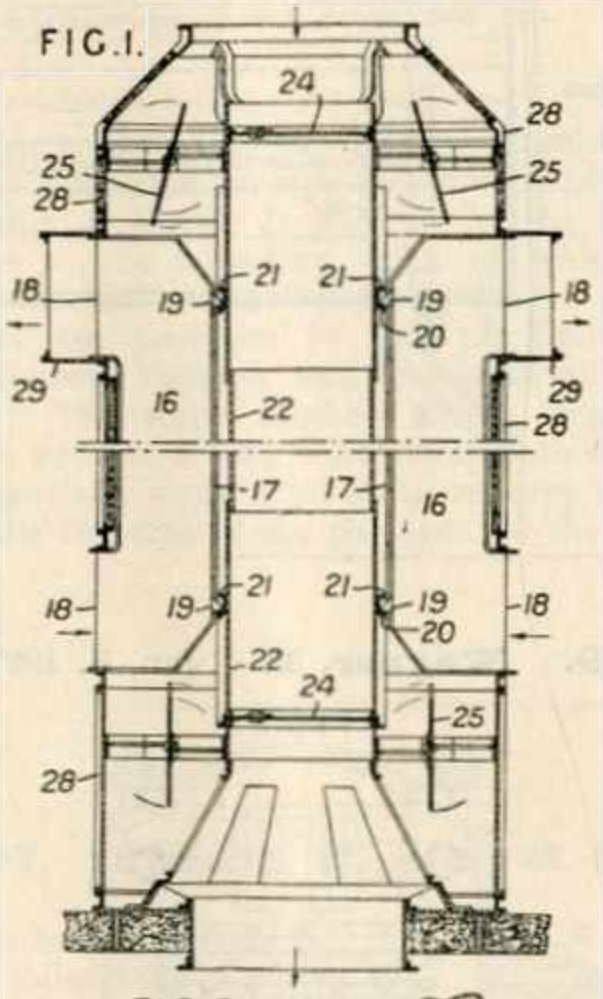
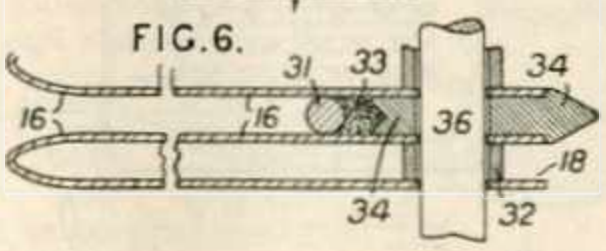


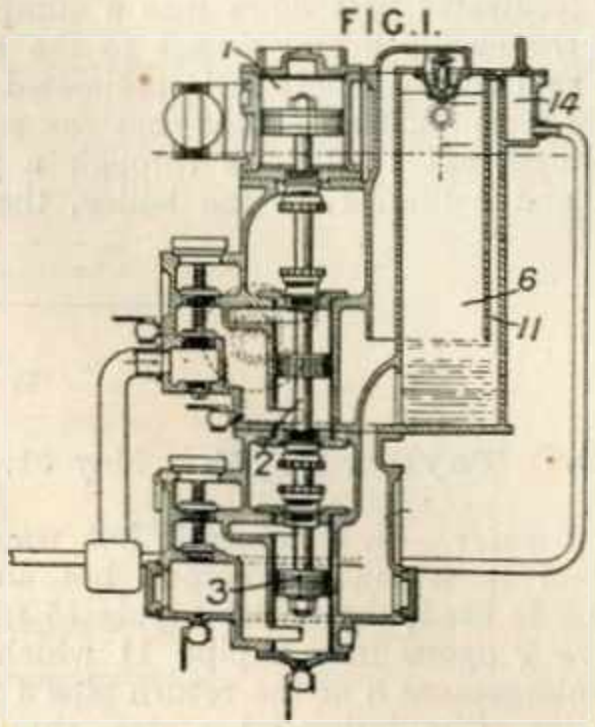
FIG. 6.



tained by a holed filling piece 34. Bolts 36 passing through distance rings 32 arranged within each element and through the holes in the filling pieces 34 clamp the whole together. The casing 28 of the heater is readily removable and may be in the form of doors or panels. The pintles on which the elements hinge may be adjustable and the elements may be flat or curved and may project radially, tangentially or otherwise around the flue 22. Steam jets may be provided for clearing the hot gas spaces. When water is to be heated, the elements may be constructed from tubes for a straight or circuitous flow therethrough. The surface of the elements may be corrugated or roughened.

278,267. Soc. Française des Pompes et Machines Worthington. Dec. 9, 1926, [*Convention date*].

FIG. 1.



Feedwater, heating.—In feed heating and supplying apparatus comprising a hot and cold pump 3, 2 driven from a single steam cylinder 1 and a chamber 6 in which the cold feed is heated by exhaust steam, the level in the chamber is controlled by discharging excess water by the pressure of the steam through a conduit 11 opening at the desired level, with an aperture of small cross-section leading into an intermediate receiver 14 above or level with the chamber 6.

278,650. Rehe, O. Oct. 5, 1926, [*Convention date*].

FIG. 1.

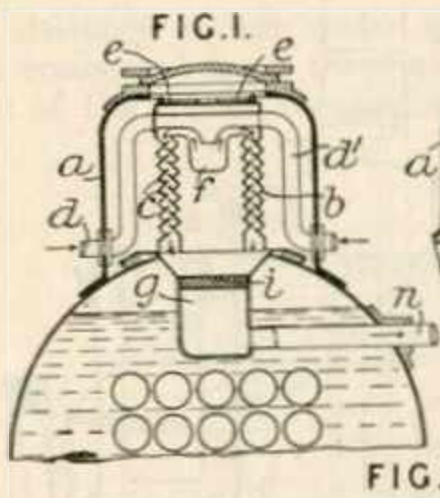


FIG. 2.

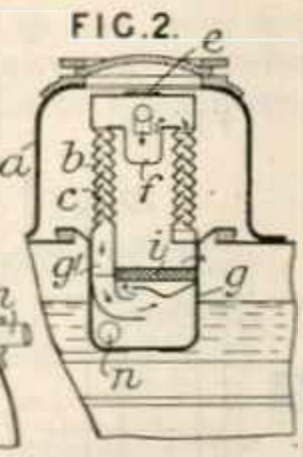
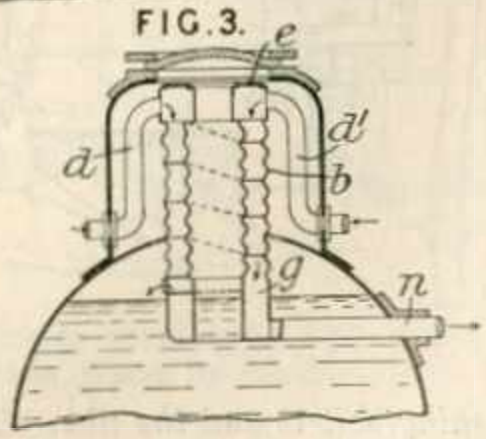


FIG. 3.



Feedwater, heating.—A separator for scale-producing salts and mud in feedwater, adapted to be fitted into the dome *a* of a locomotive

boiler, comprises a double-walled casing *b* Figs. 1 and 2, provided at the top with feedwater inlets *d*, *d*¹ and at the bottom with an open-topped sediment pump *g* having a sediment outlet pipe *n*. The feedwater first flows into a sump *f* provided in the casing *b* and thence to the annular space of said casing where it is preheated by the boiler steam to such an extent that the salts &c. are separated. It then flows through a pipe *g*, sump *g*, and a filter *i*, to the boiler, the whole path of travel of the water being indicated by arrows. The two walls of the casing *b* are of zig-zag shape and are provided with ribs *c* which lengthen the path and obstruct the flow of the water; the casing is provided with safety valves *e* which open when the pressure therein exceeds atmospheric. In a modification, the casing *b*, Fig. 3, is constructed so that the water flows in a helical path.

278,989. Taylor, T. W. May 31, 1927.

Heating water.—In a domestic hot water supply system in which a common hot and cold water tank is used, the outlet nipple 15 from the float valve 2 opens into a pipe 11 which opens into an enlargement 8 of the return pipe 4 leading to the boiler. Circulation takes place through the flow pipe 5 and return pipe 4, while hot water is drawn off by a pipe 6. To prevent overflow of cold water from the top of pipe 11, and consequent cooling of hot water in the tank, a cup 13 is provided to receive such overflow, and a pipe 16 conducts it to the bottom of the tank. The fitting 8 carries the pipe 11, cup 13, and pipe 16.

FIG. 2.

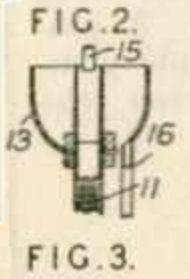


FIG. 3.

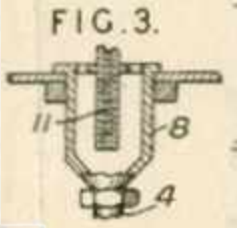
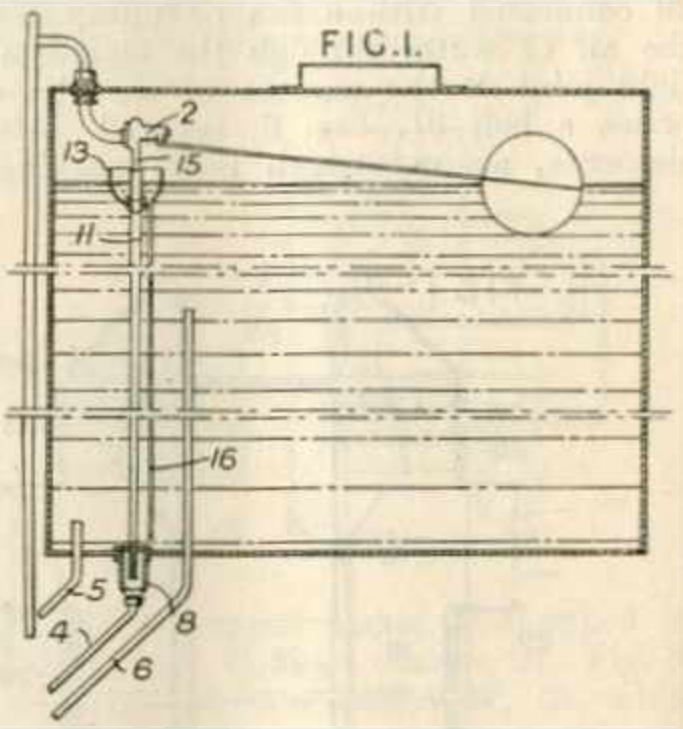
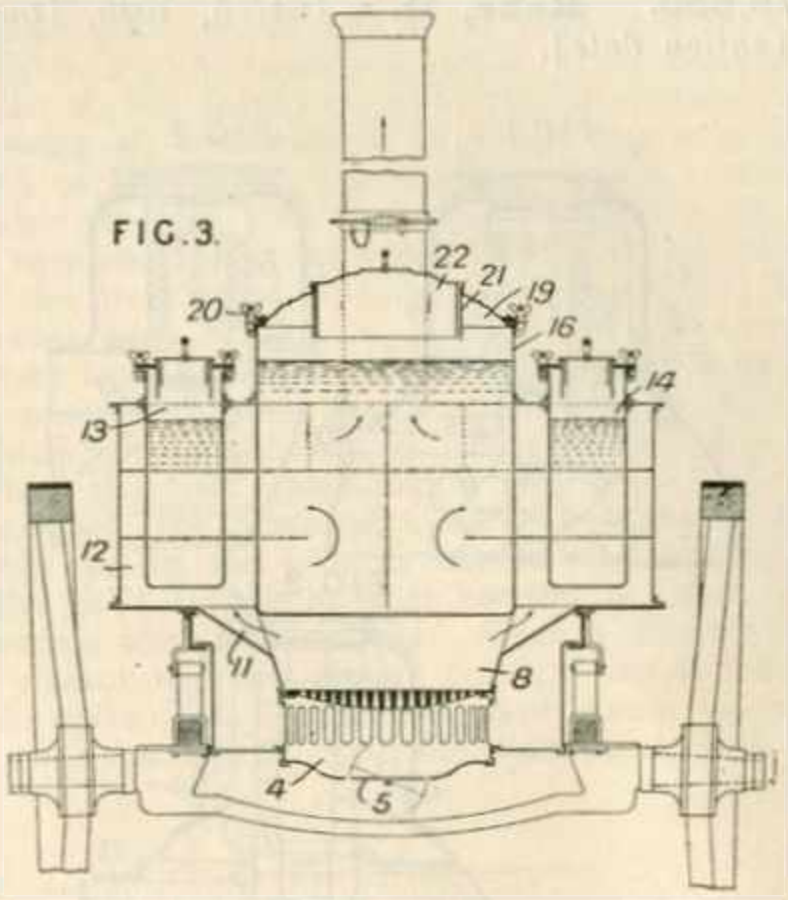


FIG. 1.



279,160. Carpineti, A. July 19, 1926.

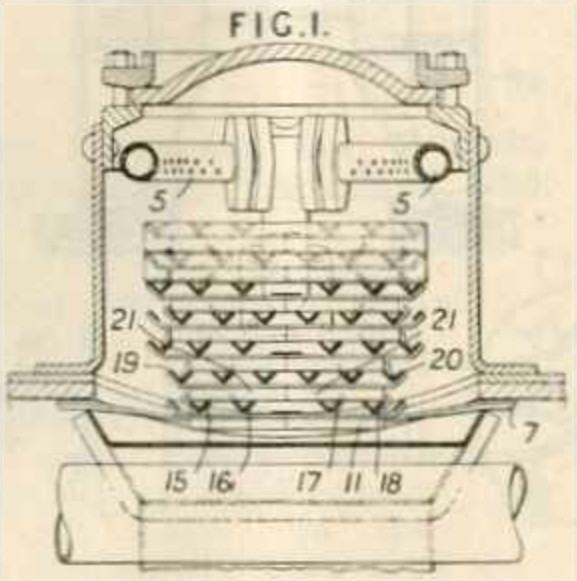
FIG. 3.



Washing-boilers and the like.—The kettles of an army or other travelling kitchen are provided with main covers 19 held in position by butterfly nuts 20 and provided with central hollows 21 fitted with deep secondary covers 22.

279,279. Wagner, F. Jan. 3, 1927.

FIG. 1.



Feedwater, heating.—A direct-contact feedheater comprises superimposed staggered rows of trays 15, 20 to which feedwater is delivered from a distributor 5, the trays being built up of independently replaceable self-contained units each comprising one or more trays secured to one or more supports. Trays 15, 16 and 17, 18 of the lowest row are secured to cross bars 11 abutting in the middle; the next higher row contains two units each of three trays 19, 20 secured to cross bars 21, and so on. The trays are prevented from side motion by suitable lugs on the outer trays of the units below. The whole heater is supported on bars 7. The trays may be of channel, or half-round section.

279,663. Leek, A. E. Dec. 8, 1926.

FIG. 10.

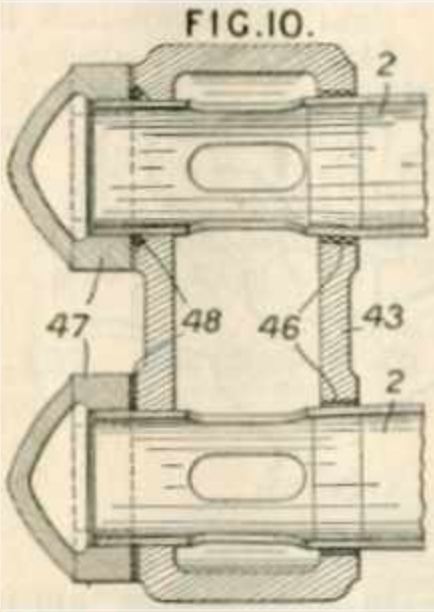


FIG. 5.

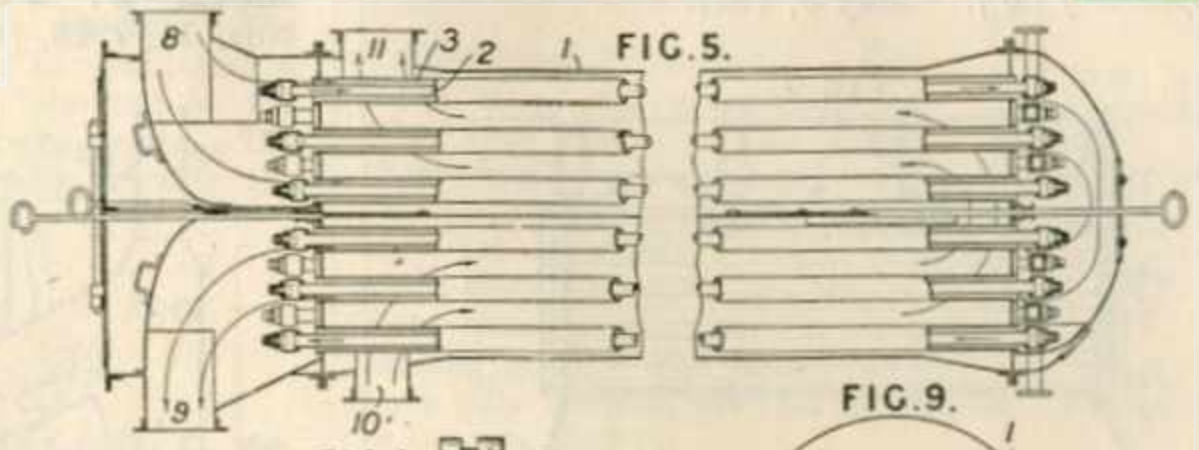


FIG. 1.

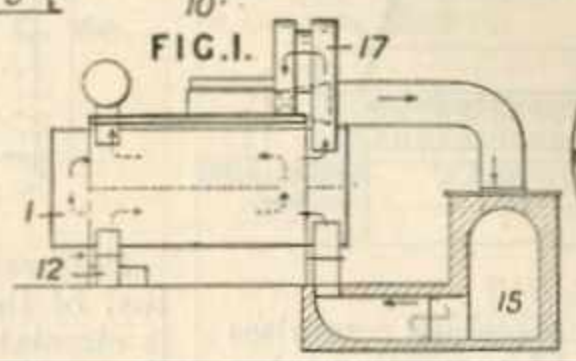
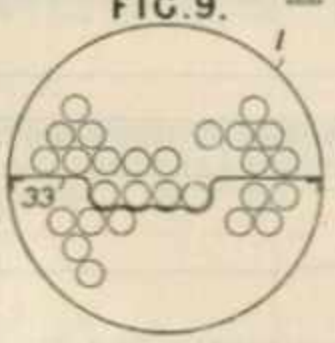


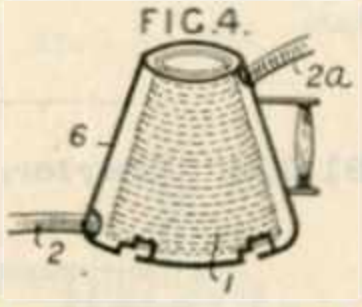
FIG. 9.



Feedwater, heating;—In a heat interchanger of the kind described in Specification 260,083, and comprising a casing 1, Fig. 5, having flue gas passages 3, the boundary walls of which form part of air and water conduits, means such as fans &c. are provided to force or induce the fluid streams through said conduits at a high velocity. The water conduits 2 are arranged in series to provide a long continuous path of travel of substantially equal cross-sectional area throughout, while the area of the passages for the air and flue gases are preferably increased radially or in steps from the inlets, 10, 8 to the outlets 1, 9 respectively by means, for example, of a baffle plate 33, Fig. 9, extending across the casing 1 and dividing it into unequal portions. The complete arrangement is shown in Fig. 1, the main flue, flue gas fan and air fan being indicated by the references 15, 17 and 12. The water conduits 2 are connected in series by means of headers 43 and screwed closing caps 47, Fig. 10, fluid-tightness being secured by packings 46, 48.

279,677. Urwand, H. Dec. 23, 1926.

FIG. 4.

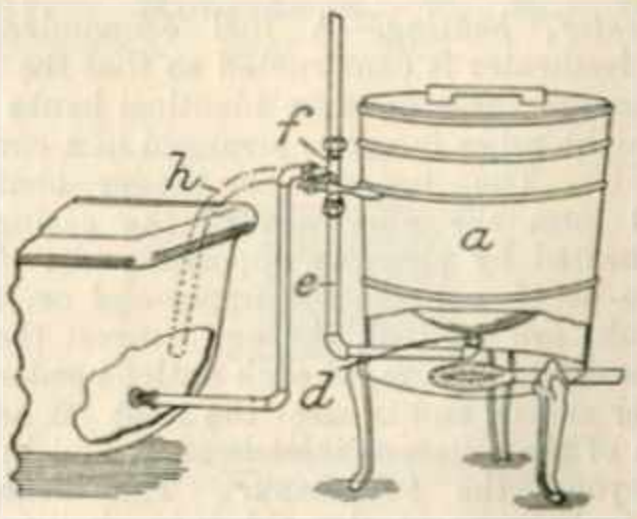


Water-tube boilers.—A conical coiled tube 1 with hood 6 and connections 2, 2a to a water supply and a point of delivery so that water passes upward through the coil, is adapted to be placed on a heating means.

Reference has been directed by the Comptroller to Specification 17487/91.

279,753. Ewart, S., and **Cathcart, A. N.** July 8, 1927.

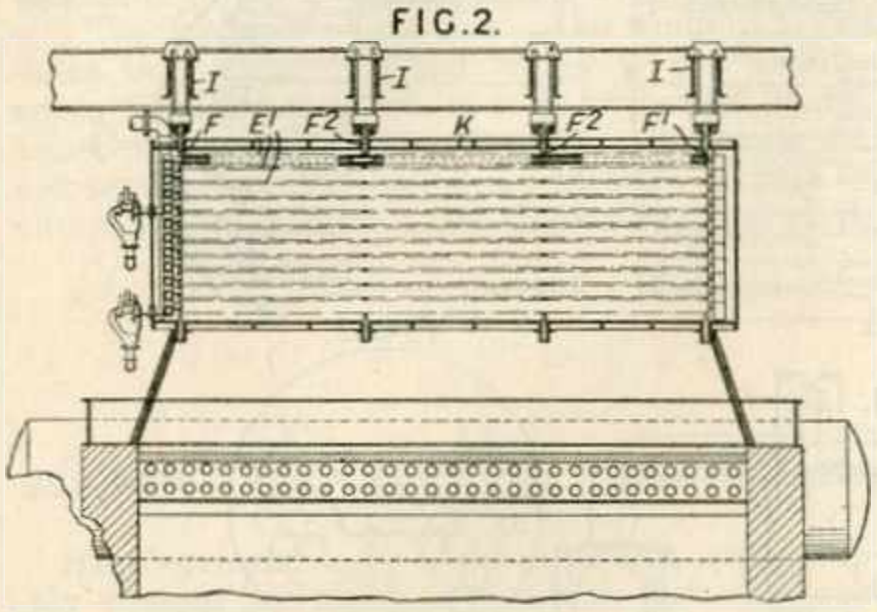
Set-pans.—A pipe *e* serving for supply of cold and delivery of hot water to and from the pan *a* is connected by a three-way valve *f* below the level of the top of the boiler to a discharge pipe



h opening at a lower level than the union *d* so that discharge takes place by siphonic action.

280,107. Robertson, T. E., (*Power Specialty Co.*). May 3, 1927.

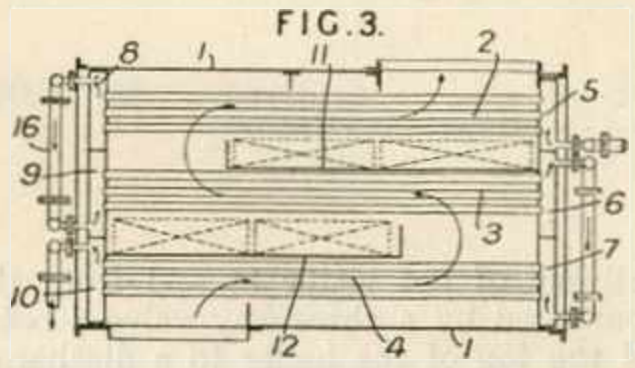
FIG.2.



Feedwater, heating.—An economizer comprises a series of tube sheets F, F¹, F² supporting tubes E¹ and means such as girders I from which the tube sheets are suspended, the housing wall K being connected to and supported by the tube sheets.

280,266. Findlay, W. St. John's-. Aug. 5, 1926.

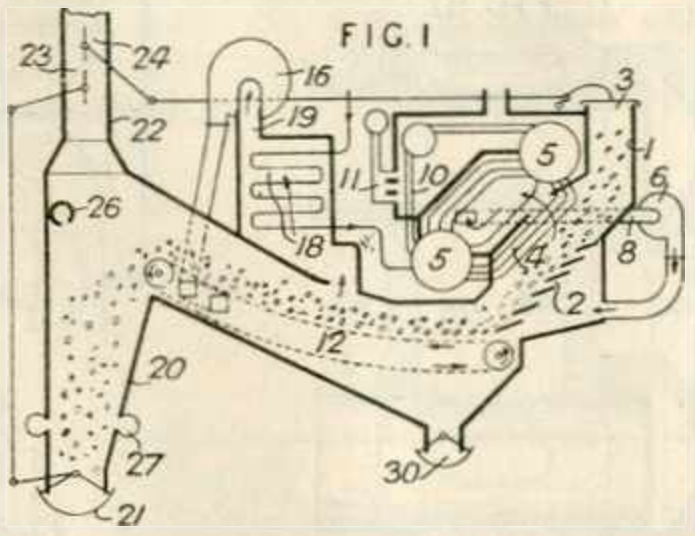
FIG.3.



Feedwater, heating.—A fuel economizer for heating feedwater is constructed so that the water flows through three or more identical banks 2, 3, 4 of straight tubes in series arranged in a common casing 1. The headers or header chambers 5 - - 10 form the end-walls of the casing and are connected by pipes at opposite ends. These pipes, as at 16, connect the upper end or, if the tube banks are vertical, the end nearest the outlet for heating medium, of each outlet header with the lower end or end nearest the inlet for heating medium of the adjacent inlet header, and in each case beyond the tube-bank. The heater is mounted above or at the side of a boiler, and mechanical scrapers may work on the baffles 11, 12 to clear them of soot. A multiple stage pump may be used, one element passing water to the heater, another element forcing the heated water to the boiler.

280,514. Frankfurter Gasges., Tillmetz, F. P., and **Schumacher, E.** Nov. 11, 1926, [*Convention date*].

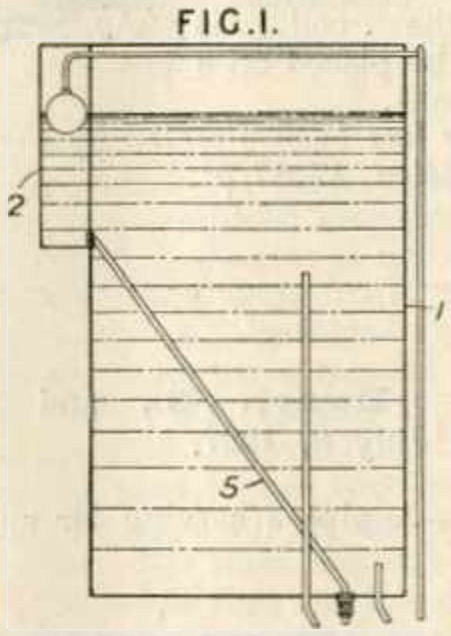
FIG.1



Feedwater, heating.—In coke-cooling apparatus, of the kind in which a stream of inert gas is circulated through the coke and a boiler plant, the cooling process is carried out in two or more separate stages for the production of high pressure steam, low pressure steam, and hot water. Incandescent coke is fed to a hopper 1, and passes to a stepped grate 2 through which inert gas is forced by a blower 6, the gas, after absorbing heat from the coke, passing over the tubes 4 of a high pressure boiler 5 and returning to the blower through a onduit 8. From the grate 2, the partly cooled coke passes to a chain grate 12, where it is again exposed to inert gas, which is supplied by a blower 16, and, after passing through the coke, flows over a feed-water heater 18 for the boiler 5 and re-enters the blower through a pipe 19. The coke finally passes into a bunker 20, where it is quenched by water from a nozzle 26 or low pressure steam supplied through a pipe 27. The water heater 18 may be replaced by a low pressure boiler supplying feedwater to the boiler 5, or there may be interposed, between the two cooling stages described, in additional stage for the generation of low pressure steam.

281,073. Taylor, T. W. Nov. 6, 1926.

FIG.1.

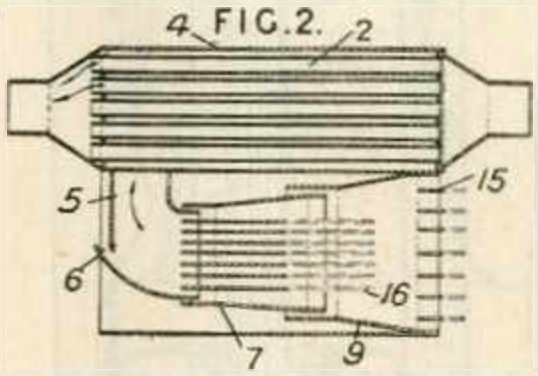


Heating water.—A domestic hot water supply system of the kind in which the hot water cistern

is adapted to be fitted into the corner of a room, is provided with a small cold water tank associated with the hot water cistern. The cistern 1 is of triangular shape in plan, and a small float-controlled tank 2 is mounted on the side remote from the corner of the room. The pipe 5 leading to the boiler passes through the cistern 1.

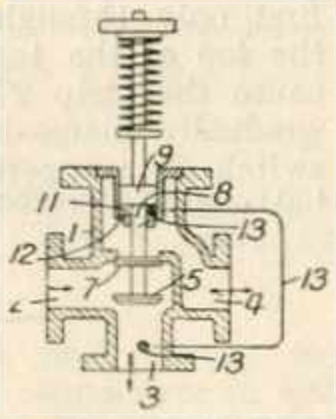
281,127. La Barre de Nanteuil, C. de. Jan. 31, 1927.

FIG.2.



Heating air.—Air passes through a grating 15 into a conical jacket 9, then into a conical jacket 7, through a grating 16, and through a nozzle 5 into a casing 4 containing tubes 2, which, in the case of a motor vehicle, are heated by the exhaust gases from the engine. The bars of the gratings are inclined rearwardly from top to bottom. A slot 6 is provided in the nozzle 5 for the escape of dust. Admission of the heated air to the interior of the vehicle is regulated by a flap valve operated by means of a turn button.

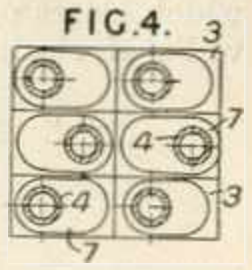
281,156. Baxter, A. April 9, 1927.



Feedwater, heating.—A valve for diverting feedwater from an economizer direct to the boiler on breakage of a tube comprises a casing 1, double-beat valves 5, 7 on stem 8 bearing a piston 9 and normally spring-pressed to close the passage from the inlet to the economizer connection 3, and to open that leading direct to the steam generator at 4. The space 11 beneath the piston 9 is in communication with the passage 3 to the economizer by a passage 13 and so long as the economizer is pressure-tight as in normal working, leakage of water through a port 12 will cause the piston 9 to be kept in a raised position and the feed will pass to the economizer. On a fall in pressure in the economizer the piston and the connected valves will fall and a way opened direct to the boiler. Specification 198,723 is referred to.

281,289. Leveque, P. Nov. 26, 1926, [*Convention date*].

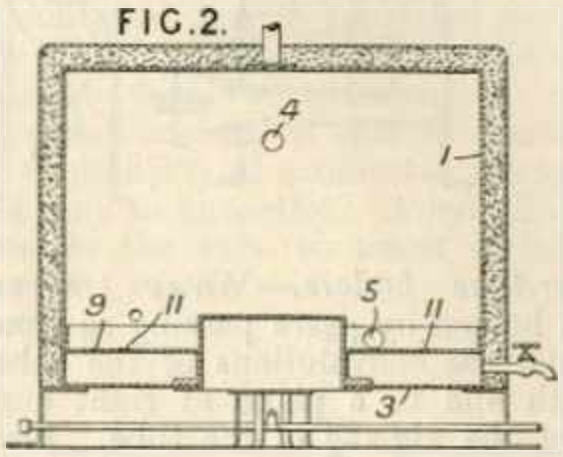
FIG.4.



Feedwater, heating. — The tubes 4 of an economizer or other heat exchanger are placed eccentrically with respect to the header plates 3 to which they are attached. Rows are alternately reversed so as to form sinuous passages for the heating gases. The tubes may have gills 7 which may be rectangular or circular or oval as shown.

281,430. Thompson, E. H. Oct. 6, 1926.

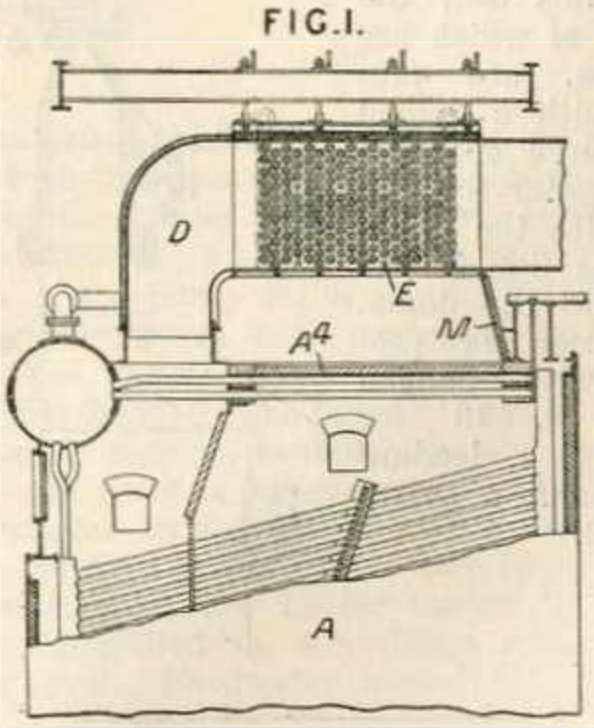
FIG.2.



Block-form boilers.—A water heater 1 is provided with a false-bottom 9 slightly above the true bottom 3 and below the inlet and outlet pipe connections 4, 5, the two chambers thus formed communicating only by one or more restricted passages 11 to retain a small body of heated water in contact with the directly heated under surface. In a modification, the bottom is flat and the lower chamber extends over the whole surface.

281,587. Robertson, T. E., (*Power Specialty Co.*). May 3, 1927.

FIG.I.



Feedwater, heating. — An economizer E is located above the boiler A and spaced away from

the top plate A^4 of the boiler housing to form a heat insulating air space. Hot gases from the boiler pass to the economizer by a conduit D which closes one side of the space, heat-insulating walls M closing the other sides.

281,819. Hatfield, H. S. Oct. 12, 1926. *No Patent granted (Sealing fee not paid).*

FIG. 1.

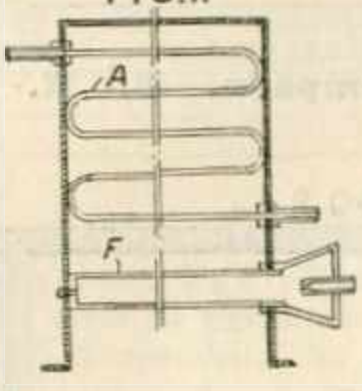
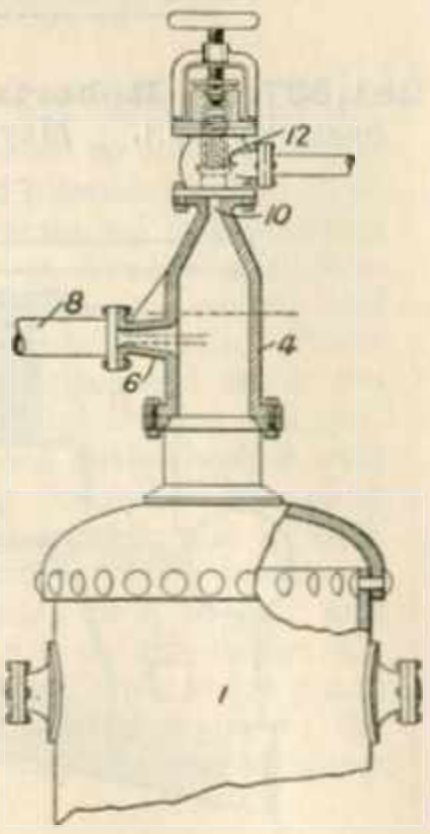


FIG. 2.

Water-tube boilers.—Water traverses a flat tube A heated by gases passing as from a burner F around the convolutions of the tube in a zig-zag path and in a plane at right angles to the plane of the zig-zag of the tube. Plates C may be used to guide the gases, or the tube convolutions relatively stepped for this purpose.

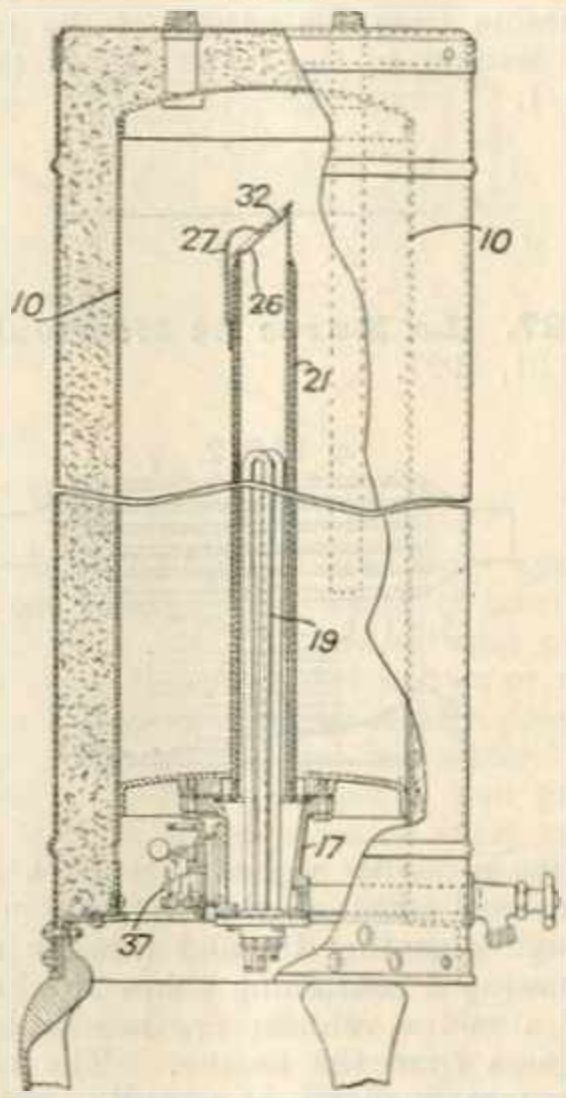
281,928. Beacon Oil Co., and **Hewetson, H. H.** April 20, 1927.



Digesters for treating liquids &c., the vapours of which are corrosive, are provided with a domed extension 4 so that the digester may be filled with the liquid until the liquid level rises into the dome. The latter is provided with flanged nipples 6, 10 for attaching a lead-off pipe 8 and a safety valve 12.

282,075. British Thomson-Houston Co., Ltd., (Assignees of *McCormick, F. H.*). Dec. 13, 1926, [*Convention date*].

FIG. 1.



Heating water.—A tank 10, with insulating jacket, is provided with an air-jacketed central circulating tube 21 extending downwards within an extension 17, through the lower end of which electric heating elements 19, preferably those described in Specification 144,767, [*Class* 37, Electricity, Measuring &c.], pass. At the upper open end of the tube 21 a valve-member 26 provided with a small circulation hole 32 is held by means of a thermostatic strip 27 so as to restrict circulation until hot water passing at first only through the hole 32 accumulates at the top of the tank 10 in sufficient quantity to cause the strip 27 to open the valve 26 to a gradually increasing extent. A heating-control switch 37 is operated when the tank is full of hot water.

282,277. Darby, E. May 13, 1927.

Washing-boilers. — The outer jacket 2 of the boiler 1 is provided with side extensions 28 to fill the gaps between the jacket and the walls of a corner of a room. The top 18 is substantially of quadrant shape and at the edges is provided with two flanges, one to which the jacket is secured and the other projecting outward and downward. The interior of the jacket has an air jacketed shield 13 around its lower part. A steam-condenser 24 has a filling pipe 25 passing

through it and an outlet pipe 27 is provided near the upper rim of the vessel. The burner 8 is adjustably supported on bearer bars 3 held by

FIG. 3.

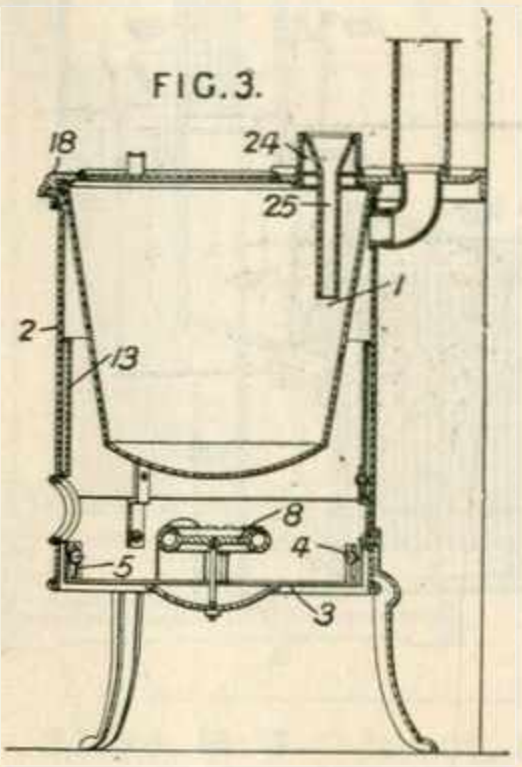
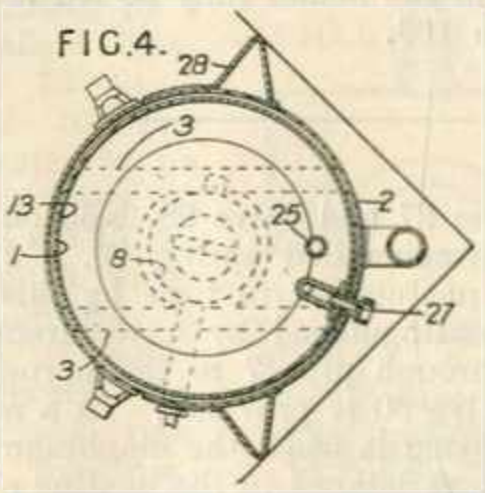


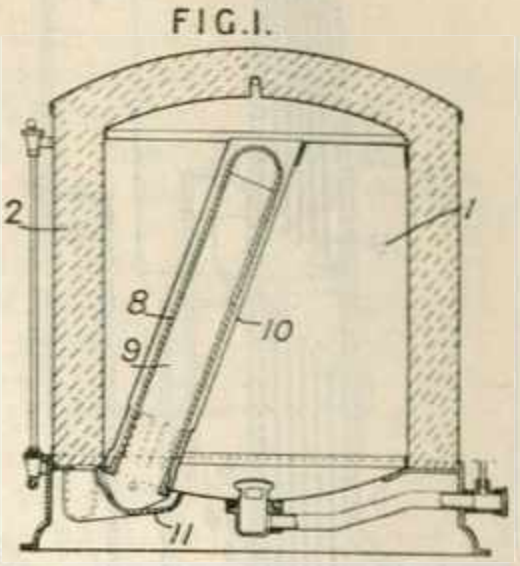
FIG. 4.



bolts 4 in the slots 5 of lugs on the ends of the bars.

282,399. Breton, J. L. Dec. 15, 1926, [*Convention date*].

FIG. 1.



Internally-fired boilers.—A water heater comprises a container 1 with insulated jacket 2, and a tube 8 closed at one extend extending preferably obliquely into the container, a gas burner being situated on one of side of partition 9 in the tube 8, products of combustion escaping down the other side to an outlet. A cylindrical casing 10 surrounds the tube to assist circulation. A channel 11 conveys away any water of condensation.

282,772. Buchner, M. Dec. 24, 1926, [*Convention date*].

Digesters for treating aluminiferous and other materials with nitric acid under heat and pressure are formed of an alloy of iron, nickel and chromium, with or without tungsten or other additional metal.

283,205. La Mont Corporation, (Assignees of *La Mont, W. D.*). Jan. 7, 1927, [*Convention date*].

Feedwater, heating.—The feed supply to a steam boiler is heated in an economizer in which a positive independent water circulation is maintained. Feedwater is circulated through a film-tube heater 13, Fig. 1, of the kind described in Specifications 171,735 and 252,314, [both in *Class* 123 (ii), Steam generators], by a pump 14, and the heated water is supplied to the film-tube boiler 3 through a pipe 21 fitted with supply control valve 22 operated in accordance with the water level in the lower header 9 of the boiler. The supply of water to the heater is controlled by a valve 24 operated in accordance with the water level in the lower header 19 of the heater. Steam generated in the heater is led off through a pipe 16 into the main steam pipe 6. The pressure in the heater may be much lower than the boiler pressure, a throttle valve 26, Fig. 2, being fitted in the pump delivery pipe 15. The supply valves 22, 24 are both controlled in accordance with the water level in the lower header 9 of the boiler. The heater may be separately fired or it may be heated by waste gases from a water gas plant or other source. The heater may be arranged in the uptake of a water-tube boiler of the vertical or horizontal tube type, the supply of water from the heater circuit to the boiler being controlled in accordance with the boiler water level. Feedwater heated in a heater 150, Fig. 7, traversed by smoke-tubes 152 is supplied to a water-tube boiler 130 and to steam generating tubes 141 around the sides of the combustion

FIG. 1.

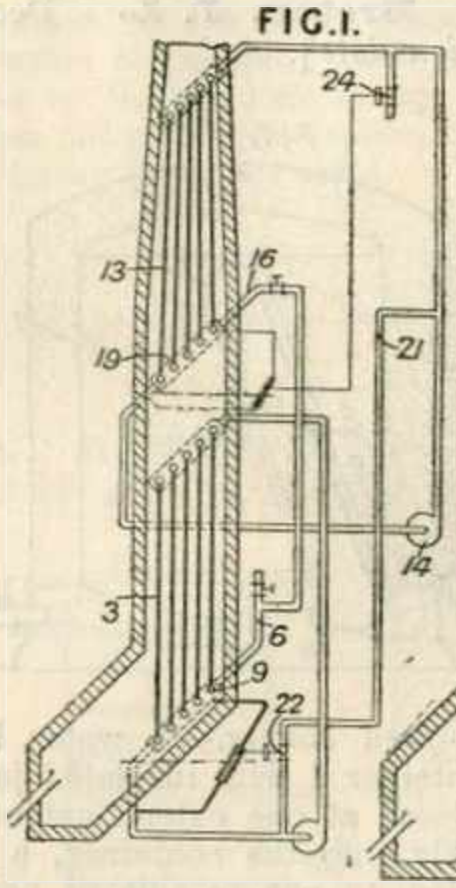


FIG. 2.

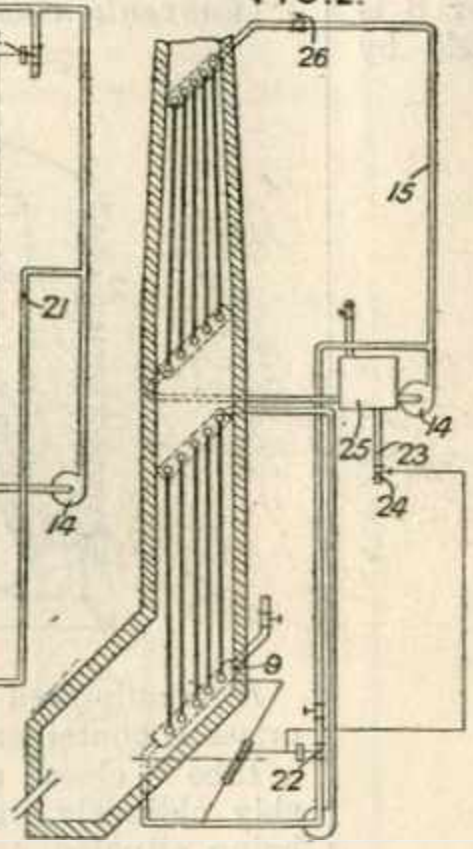
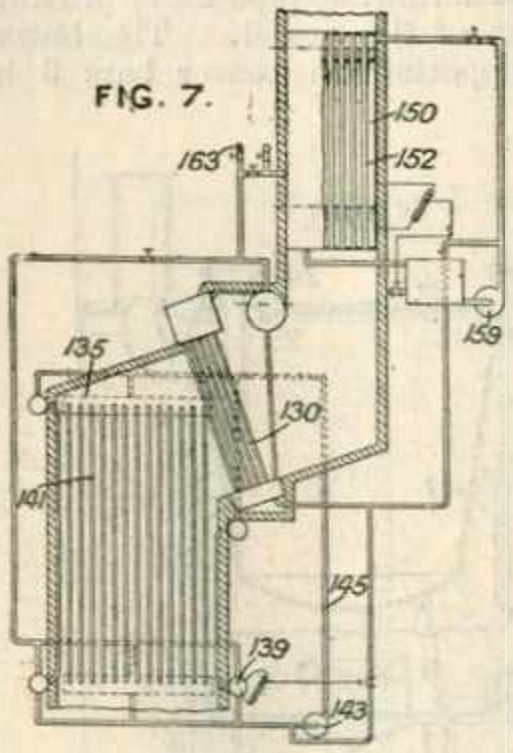


FIG. 7.

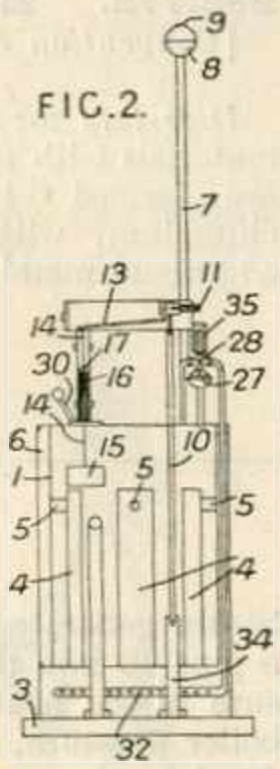


chamber. Water supplied to the upper part of the heater by the circulation pump 159 trickles down over the outer surfaces of the smoke-tubes and collects in the bottom of the heater. Steam generated in the heater may be led into the main steam pipe 163.

283,299. Carpmael, W., (*Naamlooze Vennootschap Willing's Metaalwarenfabrik*). Oct. 19, 1926.

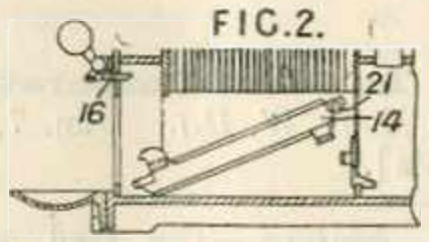
Water supply and delivery.—A boiler 1 for use in making tea &c. is connected to a cold water supply 11 and has a hot water outlet pipe which is below the liquid level when the boiler is full. An inverted **U**-pipe 7, communicating with the atmosphere, is connected at one end to the boiler below the liquid level when the boiler is full, the highest point of the tube being considerably above the boiler and its outlet pipe; the tube 7 has at its highest point an expansion ball 8 with an opening 9 through which steam is emitted when the the boiler is short of water. The boiler is heated by a gas ring 32 and has tubes 4, 5 and an outer chamber 6 through which the heating gases circulate. The boiler is supported on a hollow base 3 which is connected thereto by a tube 34, the base 3 serving to preheat the water which is supplied to the boiler through tube 10 and valve 11. Automatic operation of valve 11 is obtained by means of a float 15 connected to a control lever 13 fixed to the valve plug, by a rod 14 having a seal formed by a tube 17, secured thereto, dipping into water surrounding a tube 16 on the boiler. The gas supply to the burner 32 is automatically controlled by the steam pressure in the boiler through a diaphragm 27 and valve 28, held on its seating by a screw-controlled spring 35. If the gas supply be not cut off in time by this device the burner is extinguished by water from the boiler supplied through pipe 7 to the burner chamber; a safety valve 30 is provided. In a modification, electric heating is used, the diaphragm 27 serving to control a resistance in the heating circuit. The boiler may have a valve through which water may be drawn off directly.

FIG. 2.



283,356. Stenfors, F. I. E., and **Ahlgren, E. W.** Feb. 10, 1927.

FIG. 2.

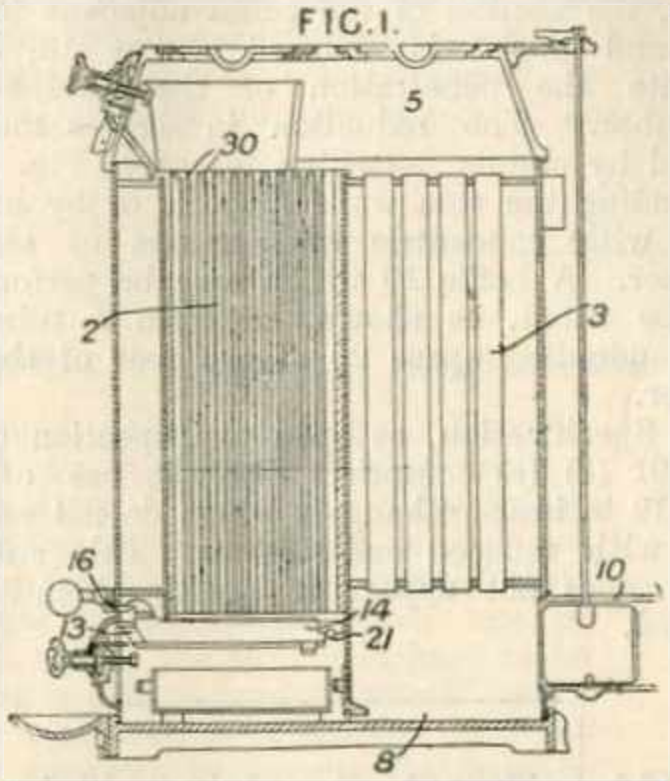


Internally-fired boilers.—The fire tube 2 of a hot water boiler is lined with removable plates having ribbed surfaces 30 for promoting combustion of the fuel adjacent the tube. The fire-tube communicates through a smoke-box 5 and tubes 3 with a soot chamber 8 having a damper controlled outlet 10. The firegrate comprises parts 13, 14, the part 13 being slidably supported by the part 14 which is pivoted to a shaft 21 and supported by a bolt 16 at its front end.

(*For Fig.* 1 *see next page*).

283,356.

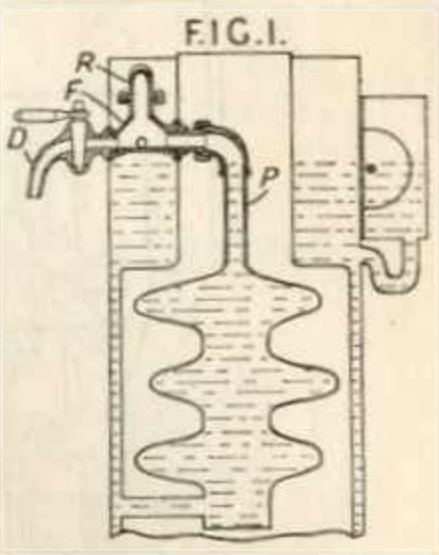
FIG. 1.



283,433. Hargreaves, H. Aug. 15, 1927.

Water delivery.—Water boilers having an expansion pipe P leading to a draw-off tap D above the normal water-level are provided with a section of pipe F having its upper surface shaped to rise towards the point at which the top section R of the expansion pipe is fixed, to facilitate the liberation of steam.

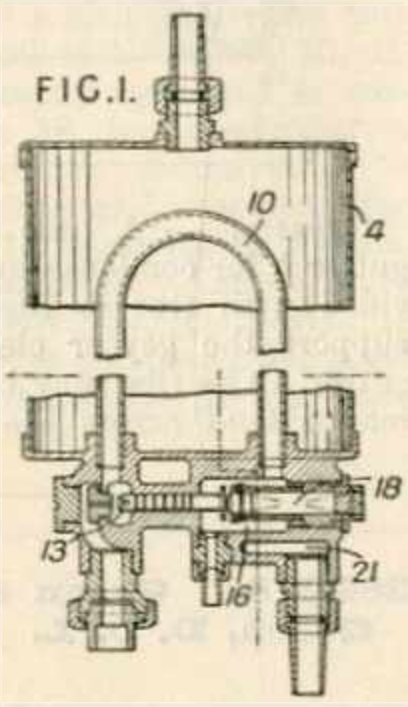
FIG. 1.



283,739. Lloyd, H. J. Jan. 20, 1927.

Heating water.—Steam is admitted by a thermostatically controlled valve 13 to a pipe or coil 10 immersed in water to be heated in a vessel 4. Cold water is fed to the vessel through a water jacket 21 around a compartment 16 housing a thermostat 18 preferably of the type described in Specification 274,267, [*Class* 64 (ii), Heating systems &c.], operating the inlet valve 13, the steam pipe exhausting through the compartment 16. The water-jacket 21 may be substantially **U**-shape the legs being open to the vessel 4.

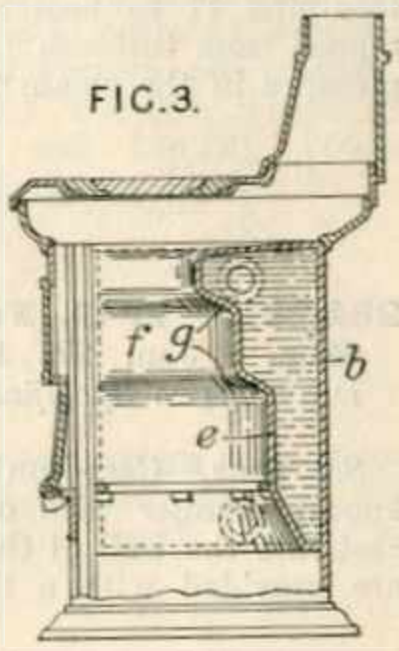
FIG. 1.



283,808. Robinson, J. C. Aug. 29, 1927.

Internally-fired boilers.—A boiler *b* with water space on three sides of a firebox *f* is provided with a series of offsets or steps *g* at an inclination to the vertical, on the firebox wall *e*.

FIG. 3.



284,125. Davey, Paxman, & Co., Ltd., and **Hazell, R. L. K.** May 21, 1927.

Internally-fired boilers.—In a multi-tubular cylindrical boiler, the furnace flue 1 opens into a rear chamber 2 from which the gases pass through the smoke tubes 3 to a front chamber 4 and return through smoke tubes 5 to a second rear chamber 6 arranged partly above and partly behind the chamber 2. The chamber 2 has an arched brick lining 12. Specification 7402/87, [*Class* 123, Steam generators], is referred to.

FIG. 1.

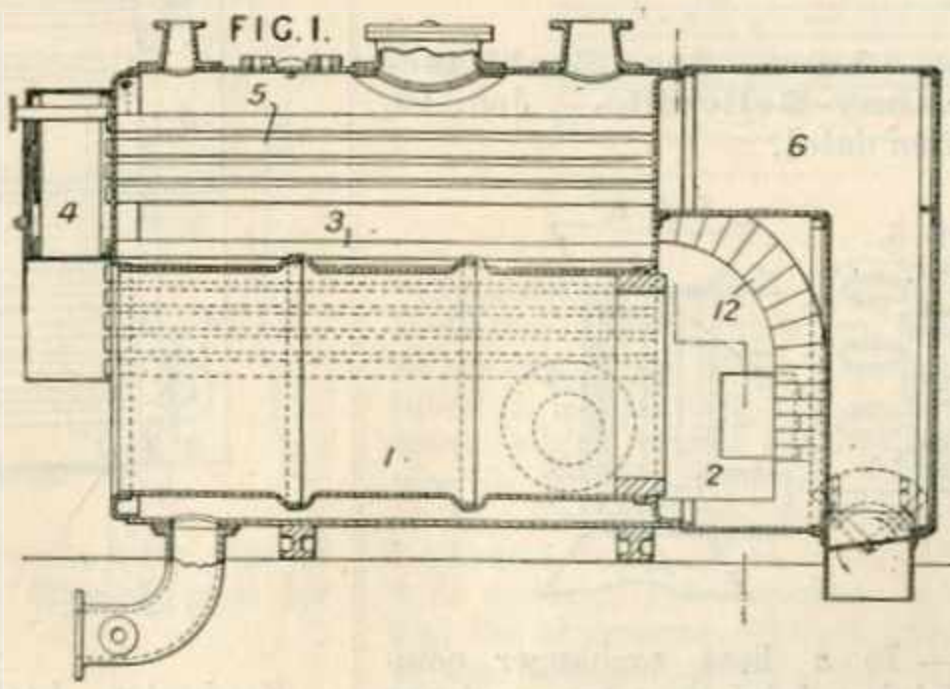
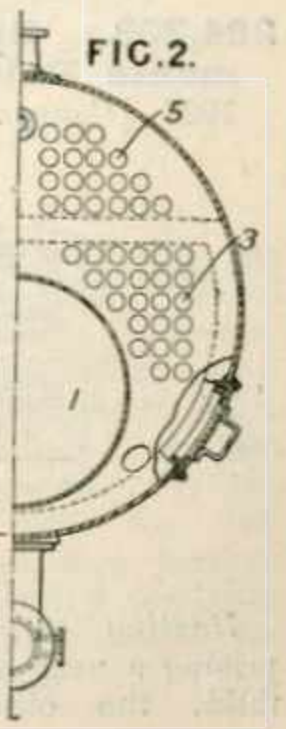
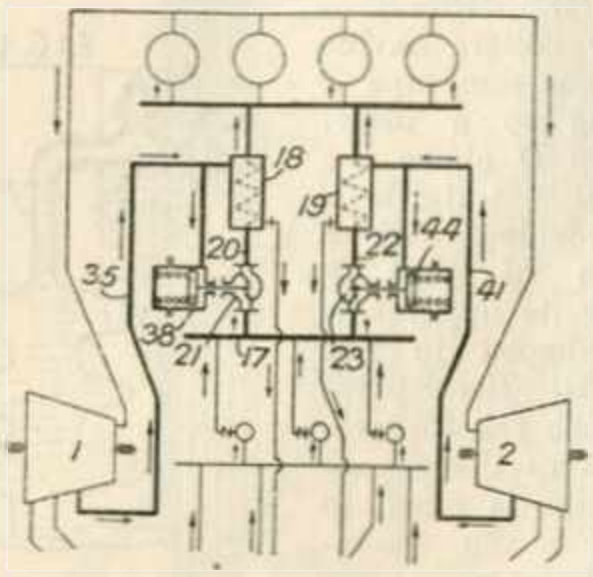


FIG. 2.



284,204. Akt.-Ges. der Maschinenfabriken Escher, Wyss, et Cie. Jan. 24, 1927, [*Convention date*].

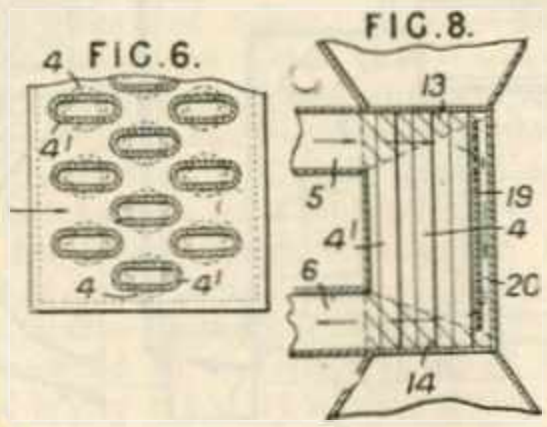


Feedwater, heating.—In a plant having a plurality of turbines, each associated with at least one high-pressure feedwater all drawing from a common feed-pipe, a regulating device is inserted in the supply pipe to each heater, controlled according to the steam consumption of the turbine with which it is associated. In the example, regulating devices 38, 44 operate valves 21, 23 in the supply pipes 20, 22 from a common feed-pipe 17 to heaters 18, 19 fed with steam tapped from turbines 1,2, in accordance with the pressure in the steam lines 35, 41.

284,281. I. G. Farbenindustrie Akt.-Ges. Jan. 27, 1927, [*Convention date*]. *Drawings to Specification.*

Set pans.—Cast-iron boiling pans, provided in known manner with ordinary or Perkins tubes cast into the wall of the boiler or on its exterior, are provided with a lining of enamel.

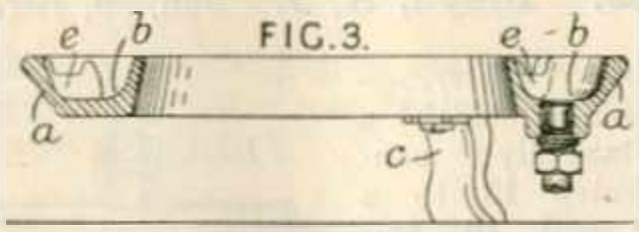
284,338. Soc. Anon. des Etablissements Delaunay-Belleville. Jan. 29, 1927, [*Convention date*].



Heating air. — In a heat exchanger comprising a nest of tubes 4 for the passage of one fluid, the other fluid traversing the outer surfaces in flowing from a side inlet 5 to a side exit 6, the section of the tubes adjacent to the inlet and outlet is reduced as at 13, 14 to facilitate the penetration of the fluid among the tubes. The reduction in section may be effected by simple flattening, as at 4¹ Fig. 6, or by bending the side walls inwards or by having tubes with concentric end-sections of smaller diameter. A baffle 19 which may be perforated, may be fitted, as shown, to form a tube-free fluid-conducting space 20 at the rear of the exchanger.

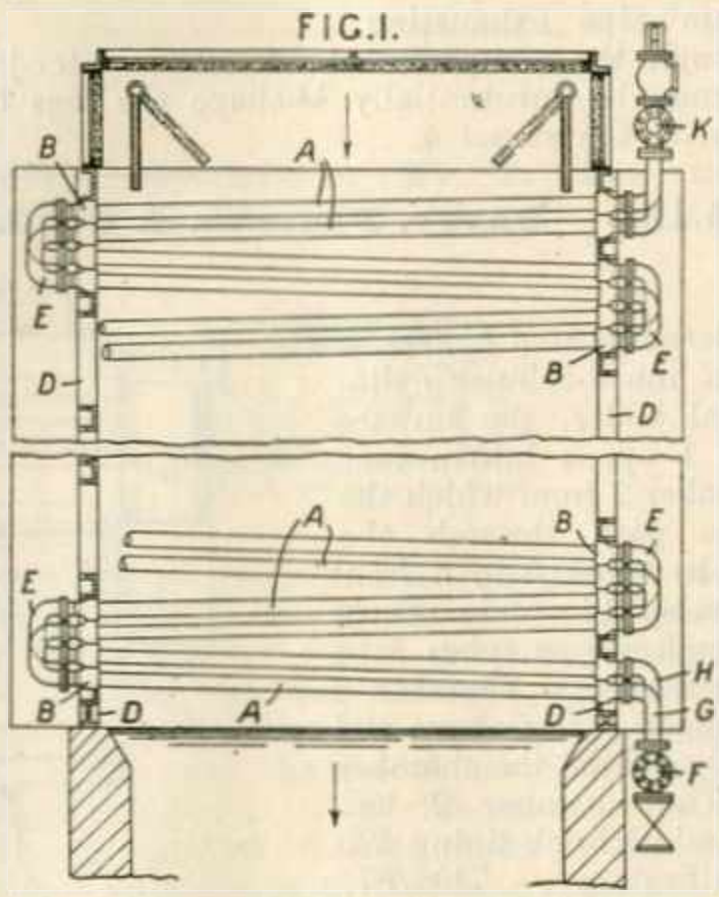
The Specification, as open to inspection under Sect. 91 (3) (a) comprises also the use of the baffle 19 in heat-exchangers which do not employ tubes with reduced end-sections. This subject-matter does not appear in the Specification as accepted.

284,544. Ewart, S. July 8, 1927.



Geysers. — A base *a* for a geyser, having a gutter *b* for condensation water and feet *c*, is provided with ribs or lugs *e* within the gutter to support the geyser clear of the bottom of the gutter. The ribs may have notches as shown and may extend across the gutter bridgewise.

284,873. Green & Son, Ltd., E., and **Green, D. C. L.** Feb. 26, 1927.



Feedwater, heating.—Superposed sections of tubes A joined to headers B are supported in