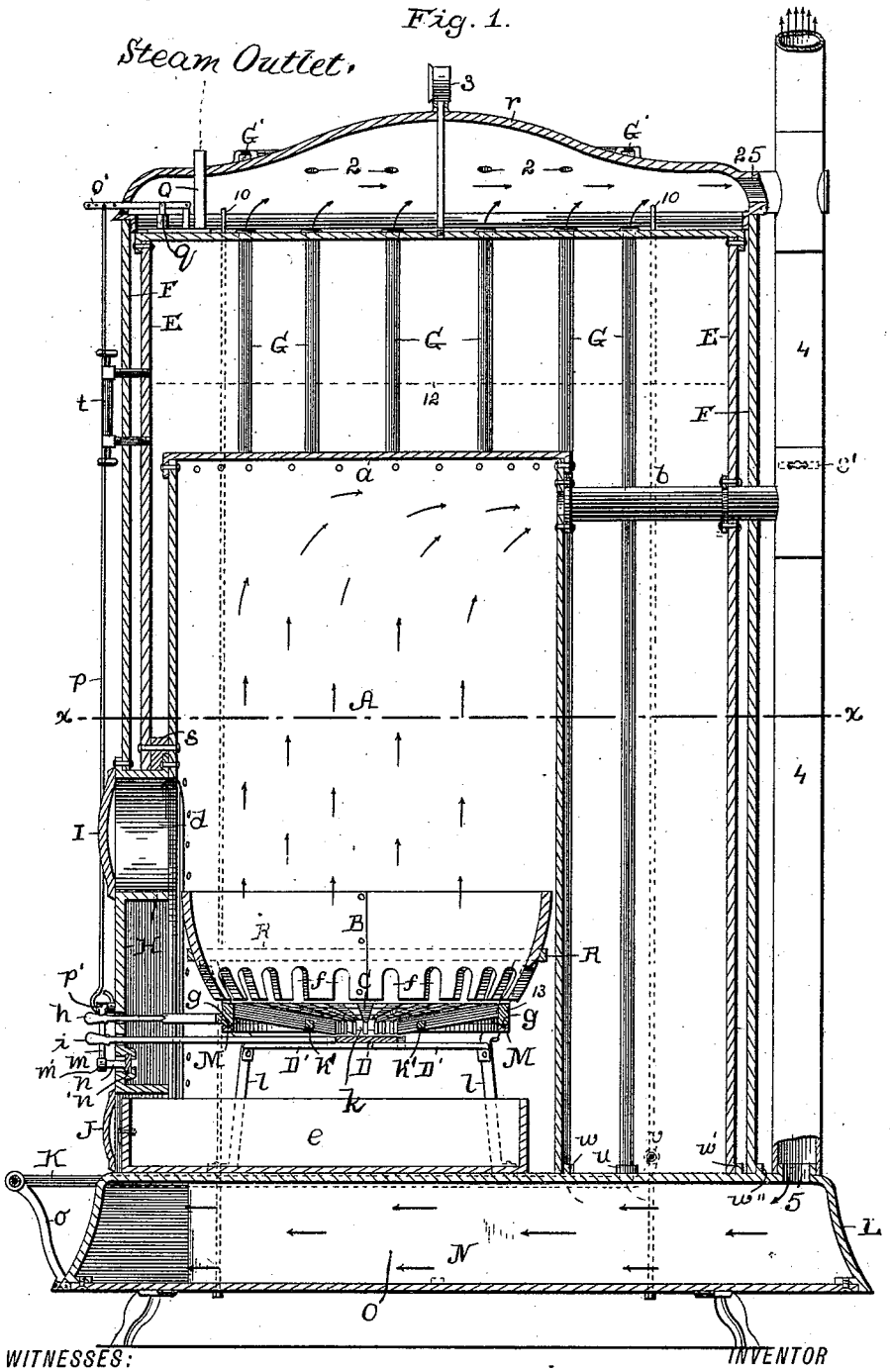
(No Model.) 3 Sheets—Sheet 1.

P. THIELEN.

STEAM HEATER.

No. 421,785. Patented Feb. 18, 1890.

Fig. 1.



N. PETERS, Photo-Lithographer, Washington, D. C.

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STEAM HEATER.

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Fig. 2.

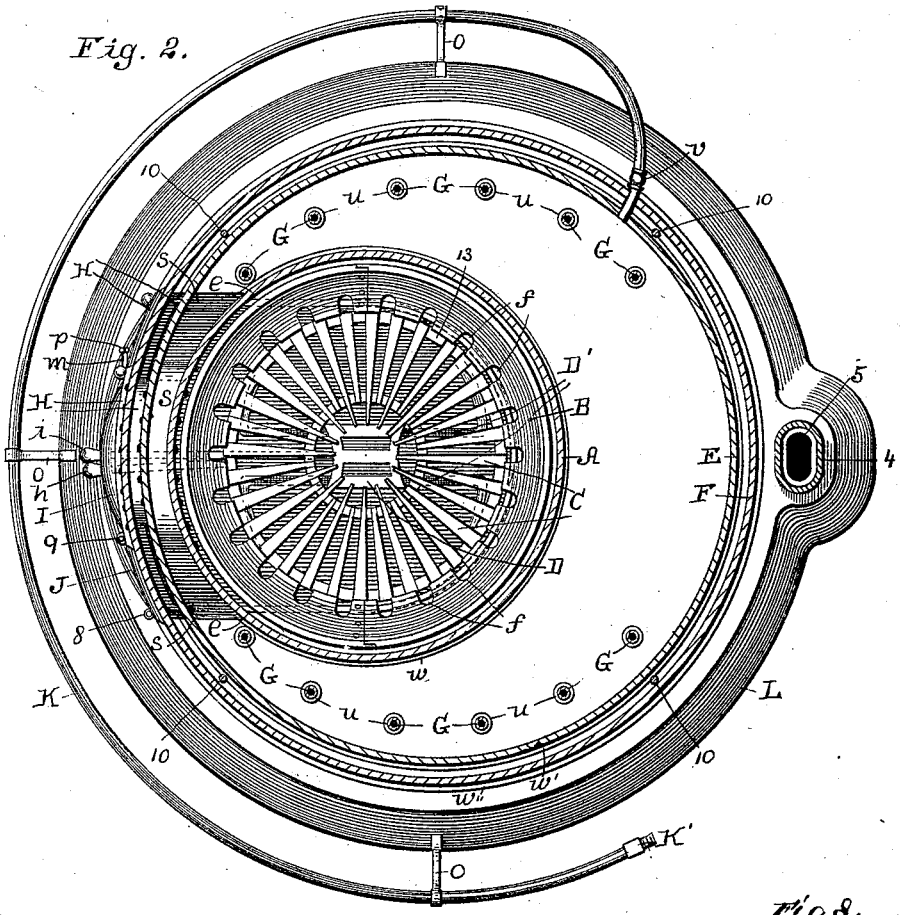


Fig. 8.

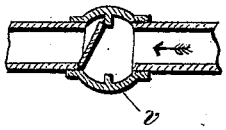
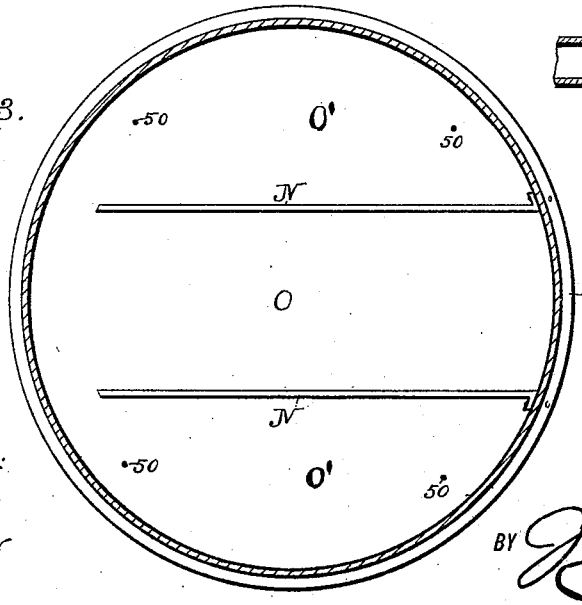


Fig. 3.



WITNESSES:

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A. A. Higdon

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his ATTORNEY.

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(No Model.) 3 Sheets—Sheet 3.

P. THIELEN.

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Fig. 4.

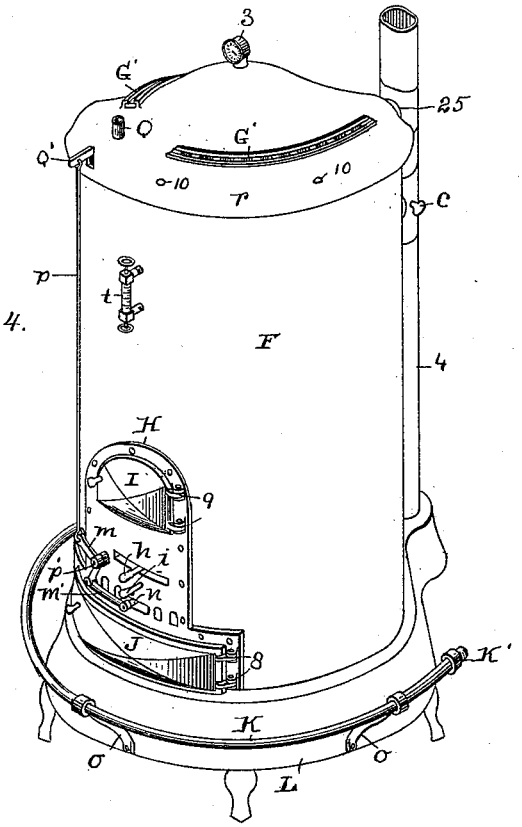


Fig. 5.

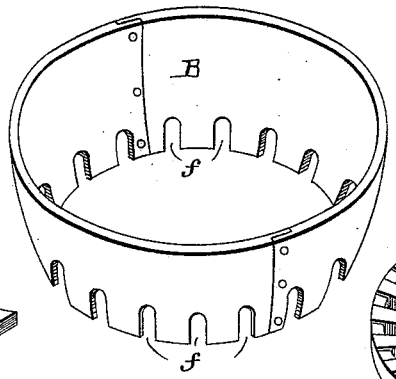


Fig. 6.

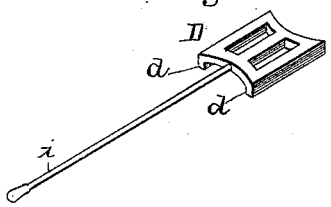
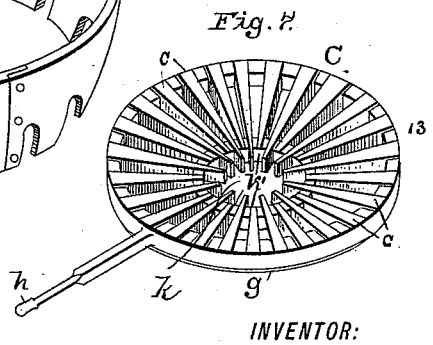


Fig. 7.



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UNITED STATES PATENT OFFICE.

PAUL THIELEN, OF KANSAS CITY, KANSAS, ASSIGNOR OF ONE-HALF TO JAMES J. SHEA, OF SAME PLACE.

STEAM-HEATER.

SPECIFICATION forming part of Letters Patent No. 421,785, dated February 18, 1890.

Application filed June 8, 1889. Serial No. 313,566. (No model.)

To all whom it may concern:

Be it known that I, PAUL THIELEN, of Kansas City, Wyandotte county, Kansas, have invented certain new and useful Improvements in Steam-Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to steam-heaters for use in buildings, cars, &c.; and it consists in a certain novel construction and arrangement of devices, fully described hereinafter in connection with the accompanying drawings, and specifically pointed out in the claims hereto appended.

In the drawings, Figure 1 is a vertical central sectional view of a steam-heater embodying my improvements. Fig. 2 is a horizontal sectional view of the same on the line *x x* of Fig. 1. Fig. 3 is a horizontal sectional view of the base, showing the partitions which deflect the heat and products of combustion, so as to cause them to pass through the vertical flues. Fig. 4 is a perspective view of the improved heater. Fig. 5 is a detached perspective view of the fire-pot. Fig. 6 is a similar view of the slide to remove the clinkers from the grate. Fig. 7 is a similar view of the grate detached; and Fig. 8 is a detail view of the check-valve located in the feed-pipe.

In the construction of my improved steam-heater I employ a heating-chamber A, which contains the annular fire-pot B, the lower edge of which is provided with a series of notches or openings *f* to admit the air, and below the said fire-pot is arranged the grate C, having radially-arranged bars *c c*, which incline downward toward the center and are separated at their adjacent ends to form an opening *k*. The rim 13 of the grate is tapered at its lower edge to form an edge *g*, which rests in a corresponding groove in the top of the supporting-ring M, which is supported in position below the fire-pot by the stationary legs *l l*, said legs being extended upwardly and outwardly, as shown by dotted lines in Fig. 1, and bolted firmly to a ring R, within which rests the fire-pot. The fire-pot is dish-shaped, having inclined or rounded sides which fit snugly in the ring R.

Below the grate are arranged parallel tracks or guide-bars D′ D′, which are affixed at their ends to the legs *l l*, and on said tracks or bars is mounted a slide D, having depending flanges *d d*, to engage the tracks or bars. This slide is normally arranged under the opening *k* in the grate to close the same, and it is provided with a handle *i*, which extends through a perforation in the front of the heater, whereby the slide may be moved back and forth on its tracks to clean the clinkers from the grate. The grate is also provided with a handle *h*, which extends through a horizontal slot in the front of the heater, whereby the grate may be moved on its bearing-ring M to relieve the same of ashes. The grate-bars are connected near their inner ends by an annular bar *k′*.

The heating-dome is arranged in the boiler E, which fits in an outer shell or casing F, a small annular space being provided between their adjacent walls, and the said boiler and casing are bolted at their lower ends to flanges *w′* and *w″* on the base L, which extends thereunder. The heating-dome is provided with an exit-pipe *b*, which extends through the boiler and the outer casing and communicates with a vertical chimney 4, which communicates at its lower end with the interior of the base L through the opening 5, and also communicates above the exit-pipe *b* with the interior of the outer casing, above the boiler, through the opening 25. A damper *c′* is arranged in the chimney above the exit-pipe *b*. Secured to the said base by means of arms *o* is a combined foot-rest and feed-pipe K, one end of which is provided with a coupling K′, by means of which a suitable supply-pipe (not shown) may be attached thereto, and the other end of which extends through registering apertures in the outer casing and the side of the boiler and communicates with the interior of the latter. Through this feed-pipe the water is introduced into the boiler, said pipe being provided just outside the casing with a check-valve *v*, which prevents back-pressure of steam or water when the boiler is receiving a supply of the latter.

The boiler is provided with the ordinary vertical flues G G, which extend through registering perforations in the base and the top

of the boiler and communicate with the interior of the base and the interior of the outer casing above the boiler. The interior of the base is provided with parallel webs or partitions N N, which extend from one side (the side adjacent to the opening 5) nearly to the opposite side, thereby forming a central compartment O, with which the lower end of the chimney communicates, and side compartments O′ O′, with which the lower ends of the vertical flues G G communicate. Therefore when the damper c' is closed the products of combustion pass down the chimney to the central compartment of the base and are carried by the parallel webs or partitions close to the opposite wall of the base and are then admitted to the side compartments, from whence they pass up through the flues G into the dome of the outer casing and escape through the opening 25 to the chimney.

The dome r of the outer casing is provided with a series of apertures 2 2, which register, respectively, with the vertical flues, whereby a cleaning-rod may be inserted into the flues through said apertures, and the latter are closed when not thus in use by small slides G′, which fit at their edges in grooved flanges on the outer surface of the dome r.

The dotted line 12 in Fig. 1 shows the water-line in the boiler, the same being indicated to the operator by the ordinary water-gage t, and 3 indicates a steam-gage, which is arranged at the center of the dome r.

Q represents the outlet-pipe for the steam, to which is connected the service-pipe to convey the steam to different parts of the building or car to be heated, and q indicates a safety-valve having an arm Q′, provided with a series of perforations, to which is connected the upper end of a rod p, which is connected at its lower end to one arm of an angle-lever m, which is pivoted on the casting H in the front of the heater, as seen at p'. This angle-lever has its other arm connected to the draft-slide n' by means of the link m', which is pivoted on the pin n.

The casting H, which is let into the front of the heater, is also provided at its lower end with a door J, through which the ash-pan e may be introduced and withdrawn, and is provided at its upper end with a door I, which closes the fuel or feed opening d.

From the above description it will be seen that simple, cheap, and reliable means are provided to secure the various parts of the heater in their positions, and the arrangement of the parts is such as to effect an economy in fuel by deriving the greatest amount of heat therefrom.

The peculiar construction of the grate and the dish-shaped fire-pot above the same causes the fuel to be concentrated at the center of the grate, and when the same becomes choked by an accumulation of clinkers the slide D is operated, by means of its handle i, to remove the latter.

Vertical through-bolts 10 10 extend from the dome of the outer casing to the bottom of the base, passing between the walls of the boiler and the outer casing, the perforations 50 (shown in Fig. 3) being provided to receive the said bolts. The fire-dome is secured in position by means of a casting s, which is placed between the wall of the boiler and the side of the fire-dome and secured thereto by means of rivets, bolts, or similar devices.

The operation of the improved heater will be readily understood from the foregoing description. To create a direct draft the damper c' is opened, thereby allowing the products of combustion to pass directly up the chimney; but when it is desired to utilize the heat in the said products the damper is closed, thereby causing them to pass downward to the base of the heater, and after being deflected to the walls of the latter they pass up the flues G and escape into the chimney through the opening 25.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a steam-heater, the combination of the boiler, the fire-chamber therein, the base-chamber under the boiler, the chamber above the boiler, the vertical flues extending through the boiler and communicating with the base and upper chambers, the chimney also communicating with said base and upper chambers, and the pipe b, extending from the fire-chamber to the chimney, the latter being provided with the valve above said pipe b, substantially as described.

2. In a steam-heater, the combination of the boiler having vertical flues and inclosing the fire-dome, the outer casing surrounding the boiler, the base arranged below the boiler and outer casing and communicating with the vertical flues of the former, said base being divided into a central compartment and side compartments by deflecting webs or partitions, and the chimney communicating at an intermediate point with the fire-dome and provided above the same with a damper and communicating with the central compartment of the base and with the upper end of the outer casing above the boiler, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

PAUL THIELEN.

Witnesses:
F. G. FISCHER,
A. A. HIGDON.