

(No Model.)

P. J. SWEENEY.

STEAM AND HOT WATER HEATING APPARATUS.

No. 467,445.

Patented Jan. 19, 1892.

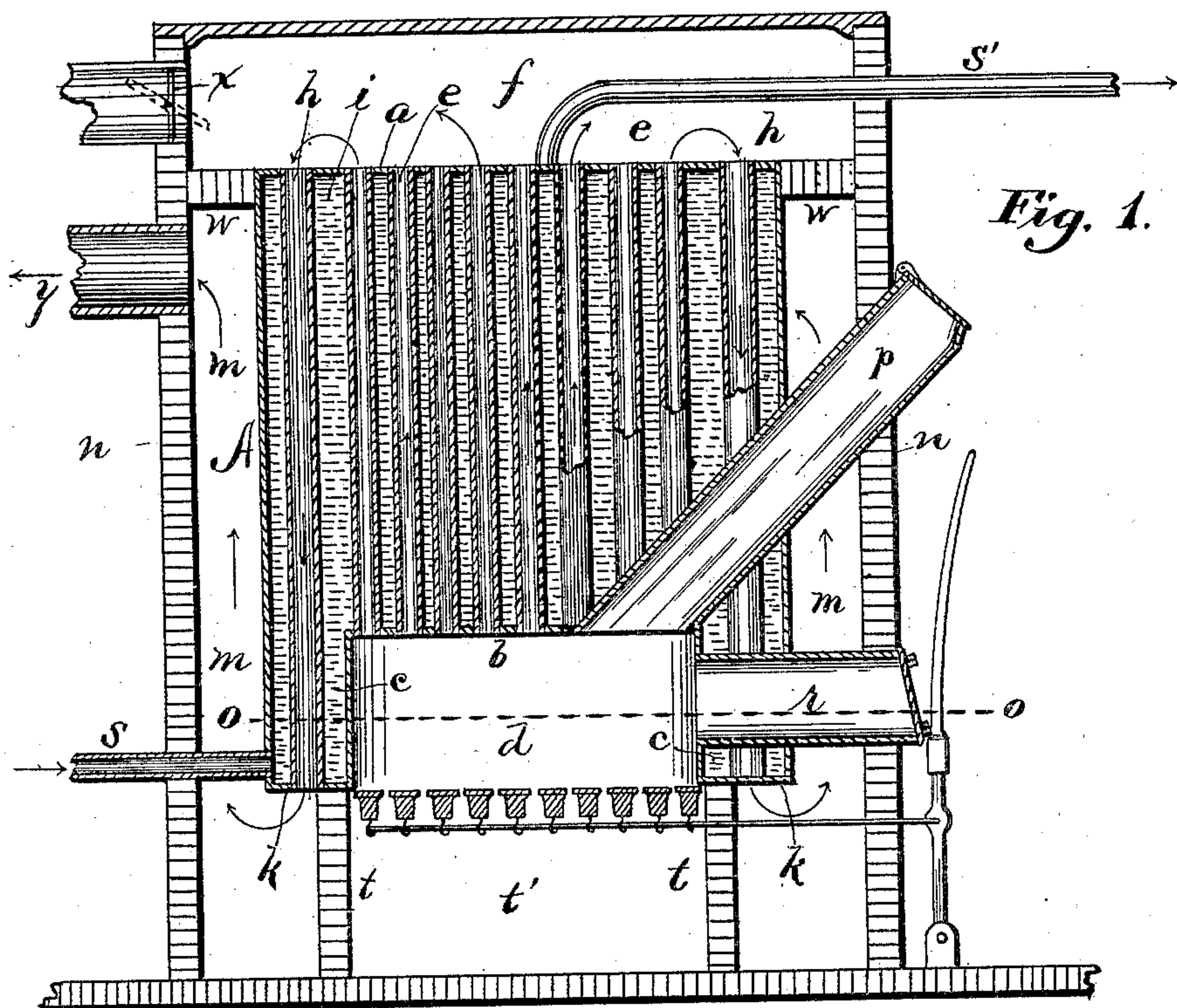


Fig. 1.

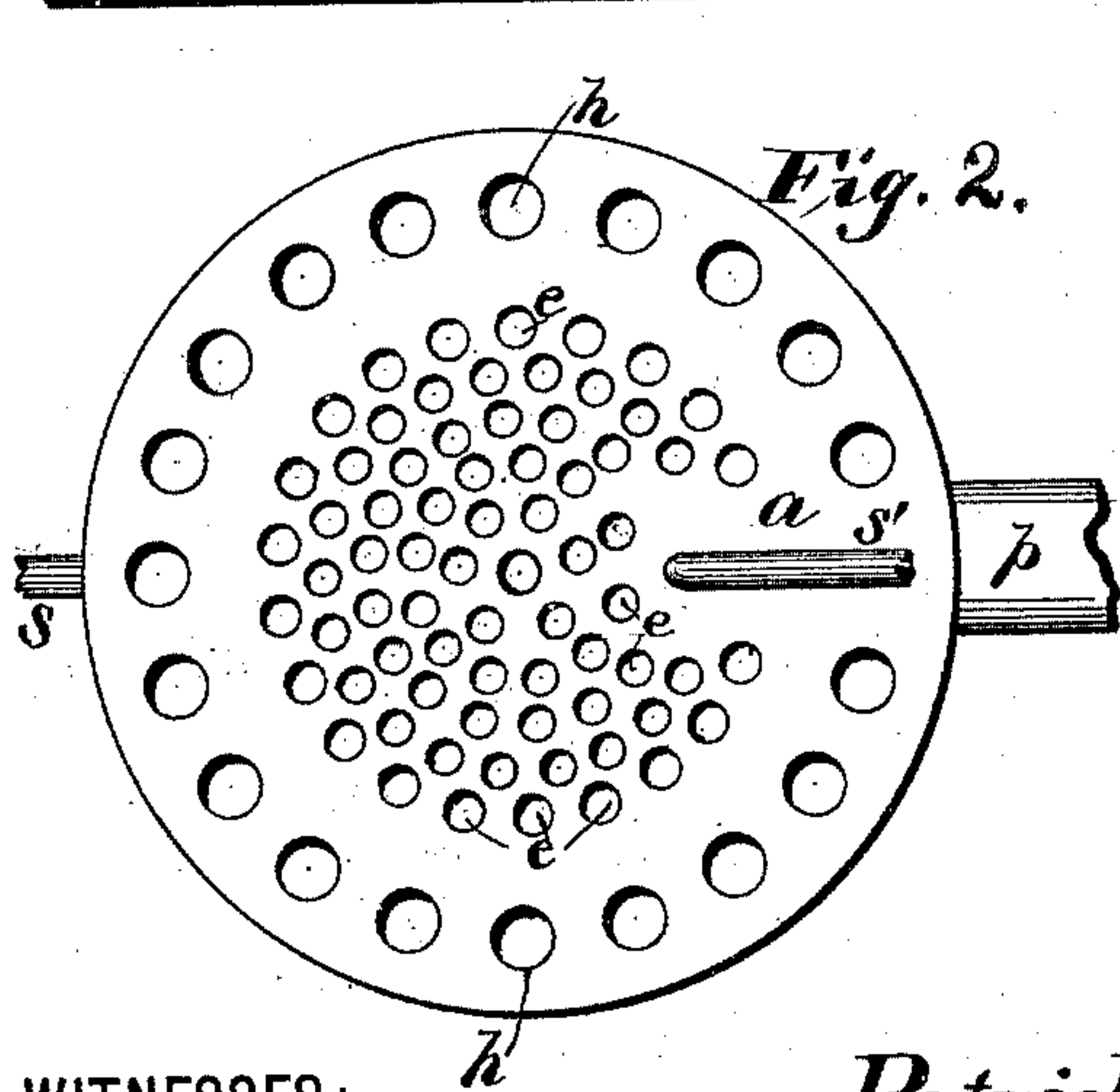


Fig. 2.

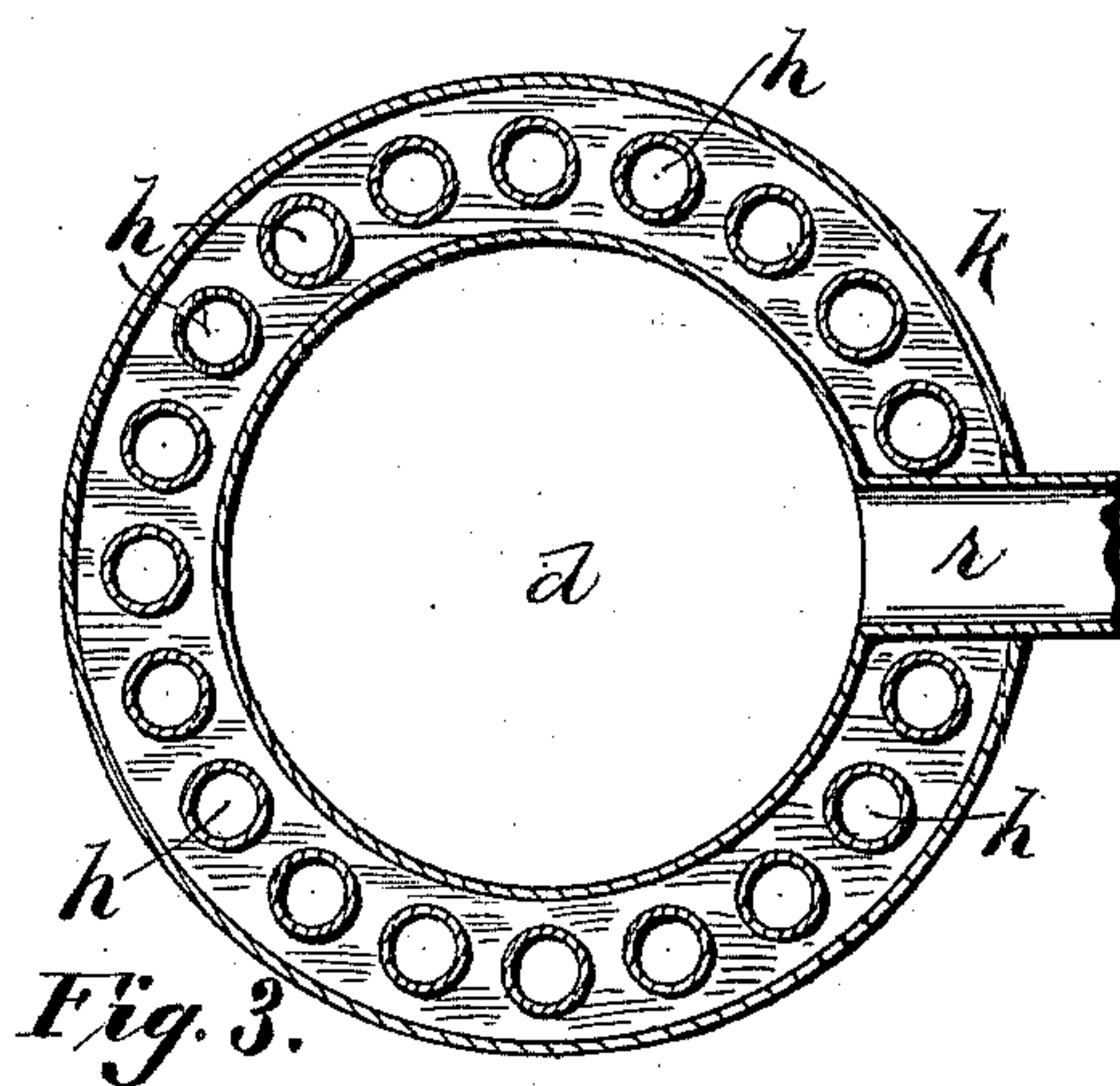


Fig. 3.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

PATRICK J. SWEENEY, OF ALBANY, NEW YORK.

## STEAM OR HOT-WATER HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 467,445, dated January 19, 1892.

Application filed May 21, 1891. Serial No. 393,563. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK J. SWEENEY, of Albany, in the county of Albany, in the State of New York, have invented new and useful Improvements in Steam or Hot-Water Heating Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to steam or hot-water heating apparatus which use both a direct and an indirect draft, as desired, and which are provided with a water-leg surrounding the fire-pot and constituting the whole or part of the walls of the combustion-chamber.

My object is to produce a boiler in which the maximum of the heat in the fuel and products of combustion are utilized by means of a water-leg around the fire-pot and the combustion-chamber and indirect-draft flues down through the water-leg, opening into a chamber between the shell of the boiler and the casing which incloses it, such boiler being provided with a chute for self-feeding of fuel into the fire-pot and also with a feed-door for hand-feeding.

My invention consists in the several novel features of construction and operation hereinafter described, and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical transverse section of the heating apparatus complete. Fig. 2 is a plan view of the upper head of the boiler.

Fig. 3 is a horizontal section on line *o o*, Fig. 1.

A is the boiler having an upper head *a*, a lower head *b*, a water-leg *c*, a fire-pot and combustion-chamber *d*, vertical smoke-flues *e* opening upward from the combustion-chamber and into the smoke-chamber *f* above the boiler, downward flues *h* from the chamber *f* through the upper boiler-head, the main water-chamber *i* therein, and the bottom *k* of the water-leg, and opening outward into the flue *m*, which surrounds the boiler and is between it and the casing *n* of brick or sheet metal; and *p* is an inclined chute for self-feed of the fuel into the fire-pot, while *r* is the ordinary hand-feed chute, both of which are closed by ordinary doors.

The boiler is provided with a water-inlet pipe *s* opening into the water-leg, and an edu-

tion-pipe *s'* opening outward from the top of the boiler and leading to the distributing system, while the pipe *s* returns it therefrom to the boiler.

The boiler is supported upon the walls *t*, which also surrounds the ash-pit *t'*, except the ordinary door for removal of ashes.

A horizontal partition *w* between the boiler and the casing separates the smoke-chamber *f* from the flue *m*, so that when the damper *x* is closed the direct shaft is shut off and the indirect draft carries the products of combustion from the chamber *f* down through the smoke-flues *h* into the flue *m*, and thence through the pipe *y* into the chimney. It will be seen that the diameters of the flues *h* are greater than that of the flues *e*, and, in fact, the area of all the flues *h* is preferably equal to or greater than the area of all the flues *e*. By thus returning all of the products of combustion through the boiler-body and the water-leg also, and surrounding the boiler and its water-leg with the products of combustion, I utilize to the utmost all of the heat generated from the fuel.

My boiler and water-leg are integral, and the water-chambers in them constitute a single water-chamber, and the water surrounds the flues *b* for their whole length for hot water and two-thirds for steam, and is heated by the passage through them of the products of combustion, and after such passage said products surround and heat the whole outer surface boiler-shell.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A steam or hot-water apparatus consisting of a boiler formed integral with an upper head *a*, a lower head *b*, a water-leg *c*, a bottom plate *k*, fire-box and combustion-chamber *d*, vertical upflues *e*, of small diameter, located over said fire-box and combustion-chamber, and the vertical downflues *h*, of large diameter, arranged around the upflues and extending straight through the water-leg, the horizontal chute *r*, the inlet-pipes *s*, the eduction-pipe *s'*, the walls *t*, on which the boiler is supported, forming an ash-pit *t'*, the casing *n*, having direct damper and indirect pipe *y*, and the horizontal partition *w*, located at the top of said boiler and dividing the space between the boiler and casing into the top smoke-chamber

*f* and into the vertical flue *m*, surrounding the boiler and supporting-walls, substantially as described.

2. A steam or hot-water apparatus consisting of a boiler formed integral with an upper head *a*, a lower head *b*, a water-leg *c*, a bottom plate *k*, fire-box and combustion-chamber *d*, vertical upflues *e*, of small diameter, located over said fire-box and combustion-chamber, the vertical downflues *h*, of large diameter, arranged around the upflues and extending straight through the water-leg, the inclined chute *p*, the horizontal chute *r*, the inlet-pipe *s*, the eduction-pipe *s'*, the walls *t*, on which

the boiler is supported, forming an ash-pit *t'*, the casing *n*, having direct damper and indirect pipe *y*, and the horizontal partition *w*, located at the top of said boiler and dividing the space between the boiler and casing into the top smoke-chamber *f* and into the vertical flue *m*, surrounding the boiler and supporting-walls, substantially as described. 15 20

In testimony whereof I have hereunto set my hand this 18th day of May, 1891.

PATRICK J. SWEENEY.

In presence of—

PATRICK EAGAN,  
JOHN F. LANG.