No. 714,183. Patented Nov. 25, 1902.

D. E. HURD.

INSTANTANEOUS COMBINED WATER HEATER AND STEAM GENERATOR.

(Application filed Mar. 20, 1902.)

(No Model.) 2 Sheets—Sheet 1.

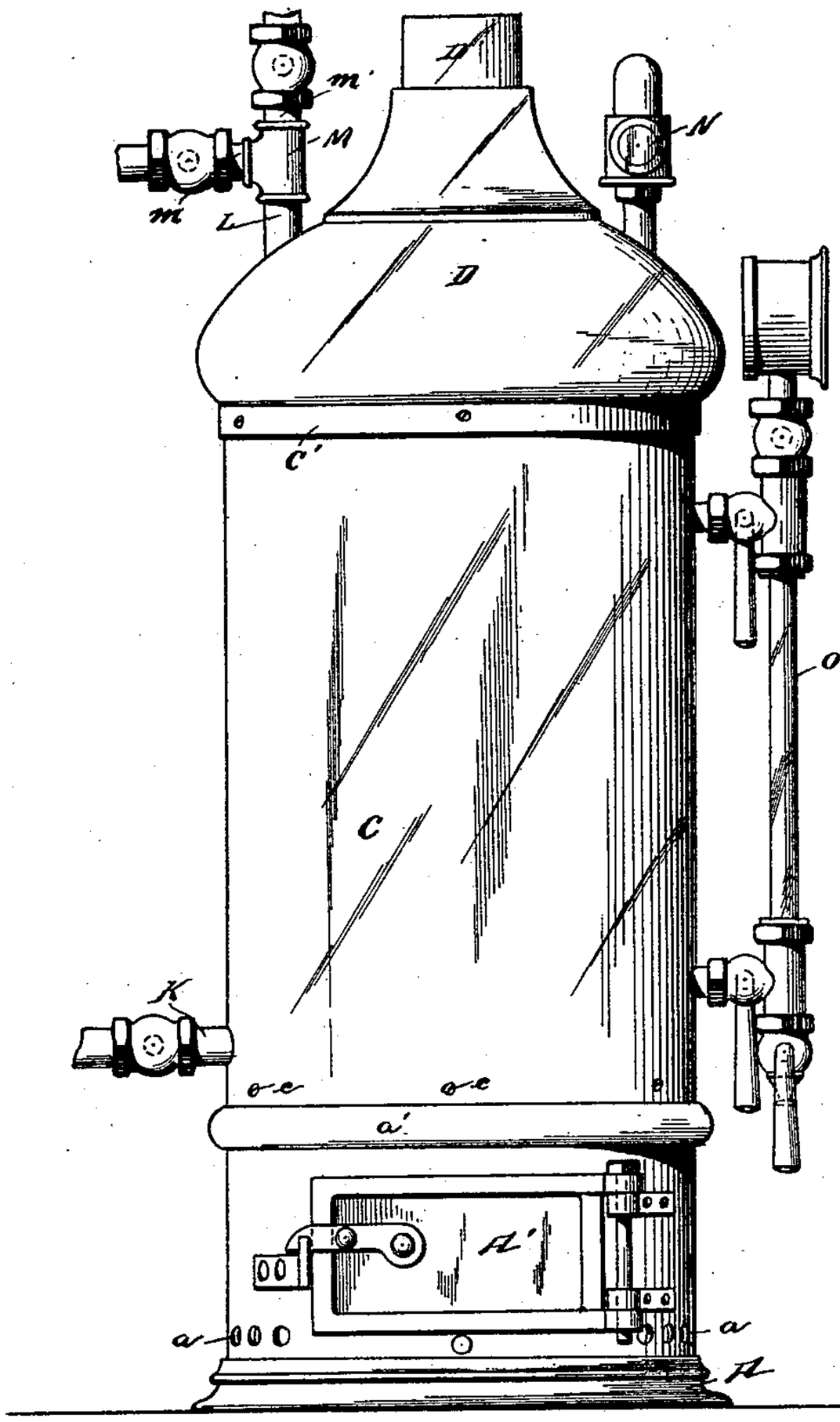

Fig. 1.

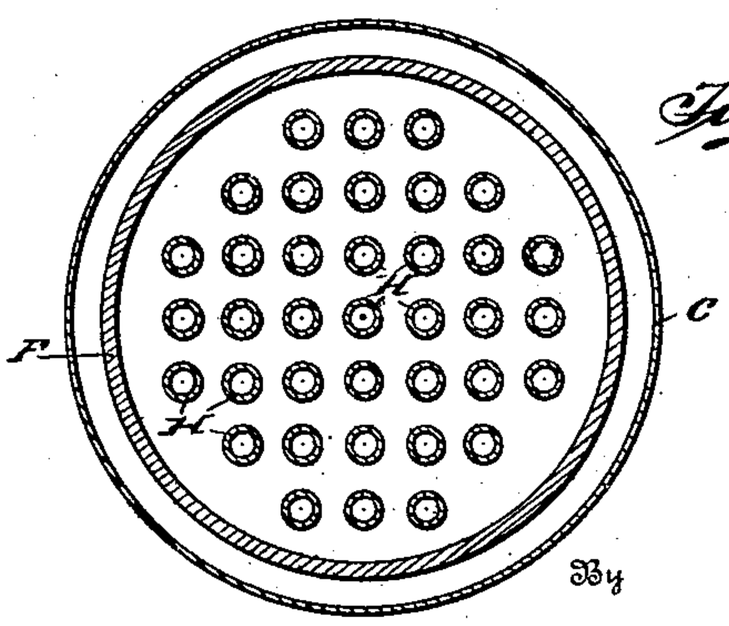

Fig. 3.

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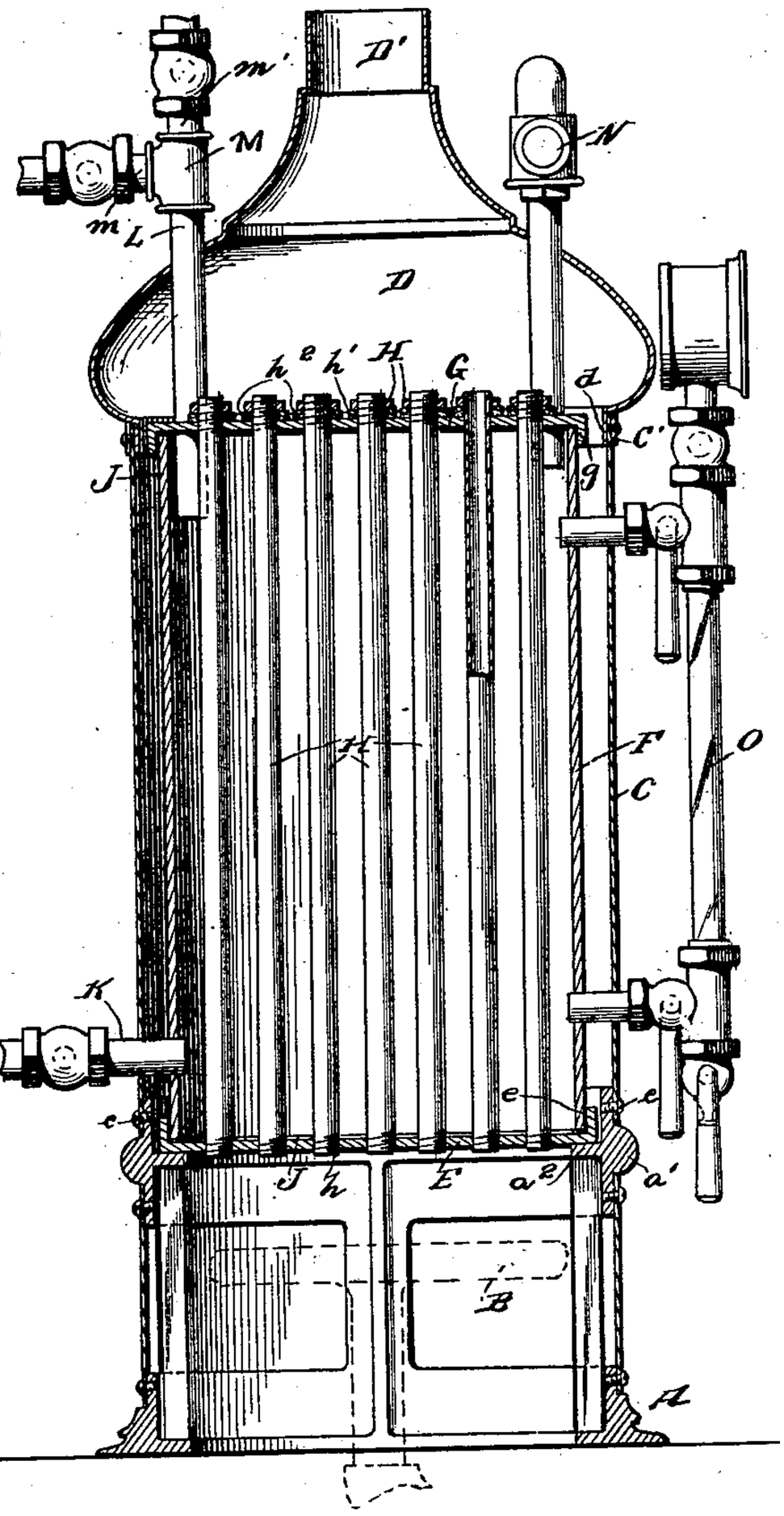
Fig. 2.



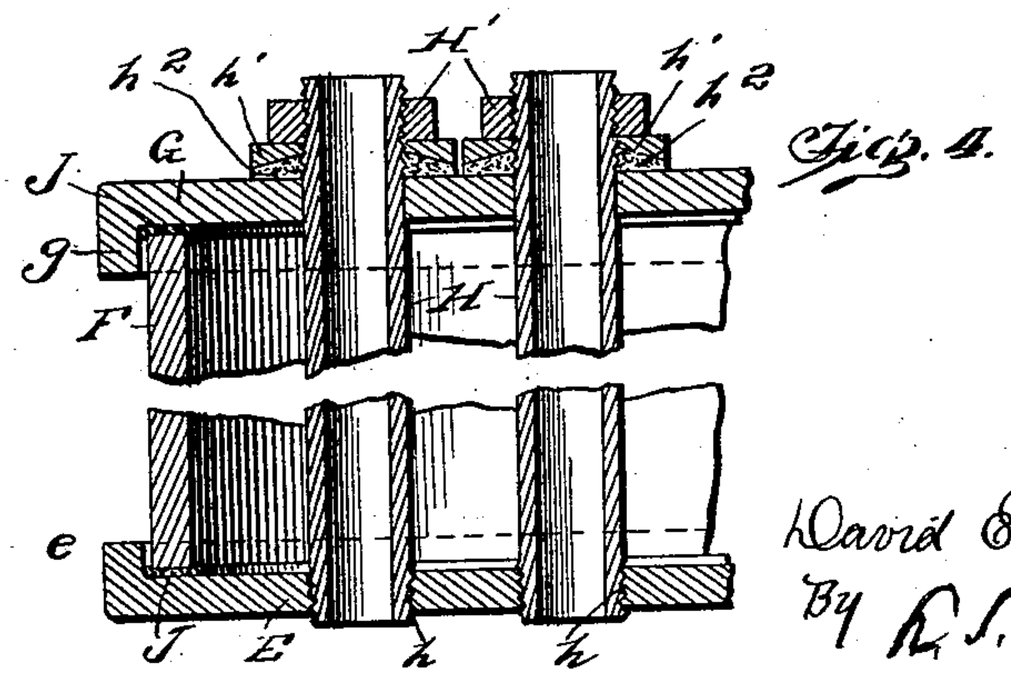


Fig. 4.

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DAVID ELMER HURD, OF BUTTE, MONTANA.

INSTANTANEOUS COMBINED WATER-HEATER AND STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 714,183, dated November 25, 1902.

Application filed March 20, 1902. Serial No. 99,228. (No model.)

To all whom it may concern:

Be it known that I, DAVID ELMER HURD, a citizen of the United States, residing at Butte, in the county of Silverbow and State of Montana, have invented certain new and useful Improvements in an Instantaneous Combined Water-Heater and Steam-Generator; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in combined water-heaters and steam-generators; and it is embodied in the construction and arrangement of parts presently to be described, and defined in the claims.

The invention is designed more particularly as an improvement in what is known as "instantaneous heaters"—that is to say, heaters for heating a relatively small supply of water for domestic or business purposes, and so very promptly and quickly.

The object of the present invention is to provide a heater of the instantaneous type which will embody structural features and combine features rendering the same useful as an instantaneous water-heater and also as a steam-generator.

It is often found necessary to utilize steam in barber-shops, restaurants, households, and for bar purposes, and it is also often required to heat water for baths and other purposes when it is not practicable to use regular fixtures or large boilers.

My invention may be termed a "portable combined water-heater and steam-generator."

An object of the invention is to construct a combined water-heater and steam-generator in an economical manner—one that will be strong and durable, resisting high pressures, and one that will embody a minimum number of structural parts.

In the drawings, Figure 1 illustrates the invention in elevation. Fig. 2 is a longitudinal vertical section. Fig. 3 is a cross-section, and Fig. 4 is a detail view.

A designates a casting constituting the base portion of the heater. This base portion is provided with a door A′ and a series of perforations *a*.

B designates a gas-burner, and in this connection I desire it understood that any convenient burner or heating means can be employed. The upper portion of the casting A has an outwardly-projecting rib *a′* located slightly above the upper edge thereof and on the inner face of the casting. Opposite the upper edge of the bead is an inturned annular flange a^2.

C designates an outer inclosing casing, conveniently of cylindrical form, its lower edge fitting over the upper edge of the casting A and resting on the rib *a′*. The casing is removably secured to the casting by screws *c*. The upper edge of the casing is reinforced by a band C′, which may be riveted or otherwise secured thereon and supports the hood D, which latter has a depending flange *d* fitting within the top of the casing, the portion immediately above the flange being bulged or extended outwardly and resting on the upper edge of the casing. The hood is tapered and terminates in a discharge-flue D′. Seated on the flange C^2 of the casting A is a head-plate E, circular in form. This plate is formed with a series of threaded openings and has its outer edge upturned to form a retaining-flange *e*. Resting on the plate E adjacent to the flange is the shell F, of cylindrical form, the same extending upward to the top of the casing and supports on its upper edge the top head-plate G, which latter is formed with a depending edge flange *g*, fitting the outer face of the upper end of the shell. The plate G has formed therein a series of openings registering with the openings in the plate E, but of larger diameter and having smooth walls. Through these openings in the plate G are passed the tubular flues H, the same extending downward and having their lower ends *h* threaded and secured into the threaded holes or openings in the base-plate E. The upper ends of the flues beyond the plate G are screw-threaded and carry the binding-nuts H′, and below these nuts are located washers *h′*, having recessed or concaved under faces, in which is placed packing material h^2, conveniently of asbestos or other suitable material. By screwing the nuts H′ down the cap-plate G is forced tightly onto the shell and the lower cap-plate is drawn upward onto the shell, and to provide a tight joint between the ends of the shell and the plates suitable gaskets or pack-

ing-rings J are interposed, the same being preferably of asbestos. In this connection it will be noted that the flanges on the plates E and G serve the purposes of properly centering the parts and also as a means for preventing the internal pressure of the boiler from forcing the packing J out from the joints.

The above method of uniting the parts has been found very simple and effective and avoids the use of stays and coupling-rods.

K designates a water-supply pipe entering the lower part of the boiler and being provided with a suitable shut-off valve. Rising from the top of the boiler proper is a discharge-pipe L, the same projecting through the hood D and being provided at its outer end with a T-coupling M, from which a hot-water pipe *m* and a steam-pipe *m'* lead, each of which is provided with a suitable valve.

N designates a safety or pop valve, located on a pipe extending out from the upper end of the boiler beyond the hood.

O designates a gage-glass provided with the usual plug-valves and steam-gage and communicating with the boiler through suitable branch pipes, as shown.

By the above construction it will be obvious that the heater can be readily assembled or dismantled, and when assembled the parts are firmly secured in position in a manner to resist relatively high pressures.

In use when hot water is desired the boiler or heater is filled and the gas lighted. The pressure from the main or water-supply will cause the water to flow into and out of the boiler in an obvious manner, the products of combustion and heated gases passing up through the tubes, thus heating the water quickly.

Should it be desired to generate steam, it is only necessary to cut off the water-supply, lowering the water in the boiler to the proper level, ascertainable through the gage-glass. The steam generated in the boiler can then be conducted away from the boiler.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a combined water-heater and steam-generator, the combination of a base having an outer supporting projection and an inner flange at its upper edge, a casing supported on the projection, a head-plate supported on the flange having an upturned annular flange at its upper edge and provided with a series of perforations, a shell resting on the head-plate adjacent the flange, packing interposed between the shell and the plate, an opposite head-plate having an annular flange fitting over the upper ends of the shell and provided with a series of smooth perforations, flues having their lower ends in threaded engagement with the lower head-plate, nuts on the upper ends of the flues, packing between the nuts and the adjacent head-plate, packing interposed between the shell and the upper head-plate, and a hood on the casing, substantially as described.

2. In a boiler the combination with a head-plate having an upturned annular flange at its edge and provided with a series of threaded perforations, of a shell resting on the head-plate adjacent the flange, packing interposed between the shell and the plate, an opposite head-plate having an annular edge flange fitting over the upper ends of the shell and provided with a series of smooth perforations, flues having their lower ends in threaded engagement with the lower head-plate, nuts on the upper ends of the flues, recessed washers on the flues, a packing between the washers and the adjacent head-plate, and a packing between the shell and the upper head-plate, substantially as described.

3. In a boiler the combination with a head-plate having an upturned annular flange at its edge and provided with a series of threaded perforations, of a shell resting on the head-plate adjacent the flange, packing interposed between the shell and the plate, an opposite head-plate having an annular edge flange fitting over the upper ends of the shell and provided with a series of smooth perforations, flues having their lower ends in threaded engagement with the lower head-plate, nuts on the upper ends of the flues, a packing between the nuts and the adjacent head-plate and a packing between the shell and the upper head-plate, substantially as described.

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

DAVID ELMER HURD.

Witnesses:

JOHN C. HEESCH,

EDWARD G. SMITH.