

No. 662,232.

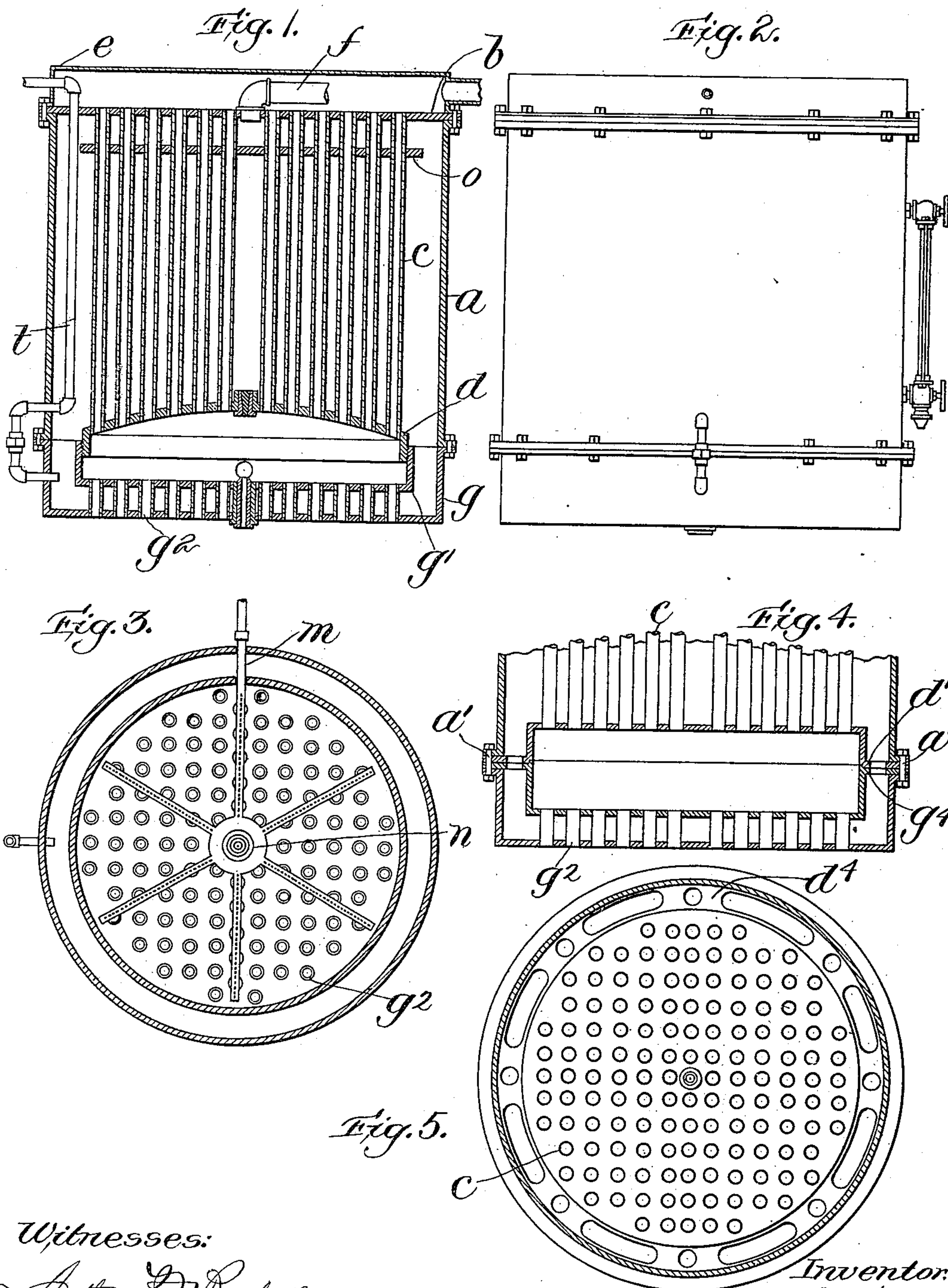
Patented Nov. 20, 1900.

L. J. HARRIS.
STEAM BOILER.

(Application filed June 21, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
Arthur D. Randall.
Elliott N. Stevens

Inventor:
Louis J. Harris
by Geo. N. Goddard
Attorney.

No. 662,232.

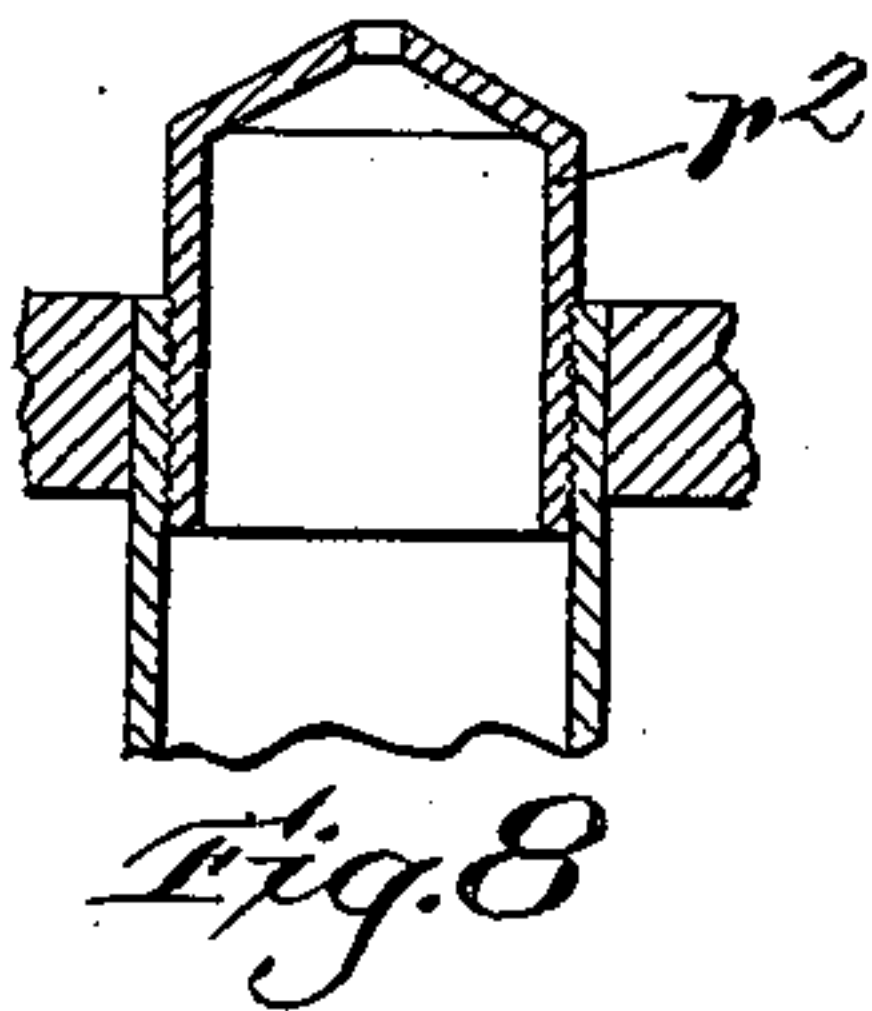
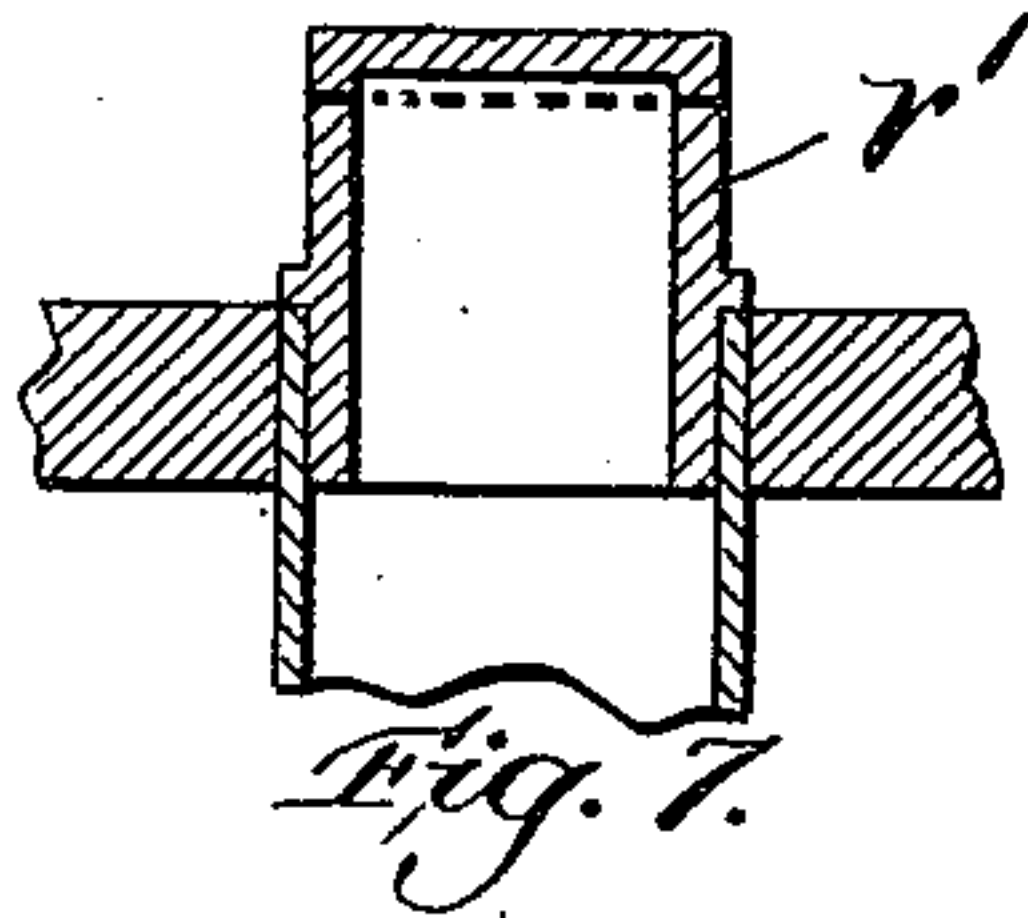
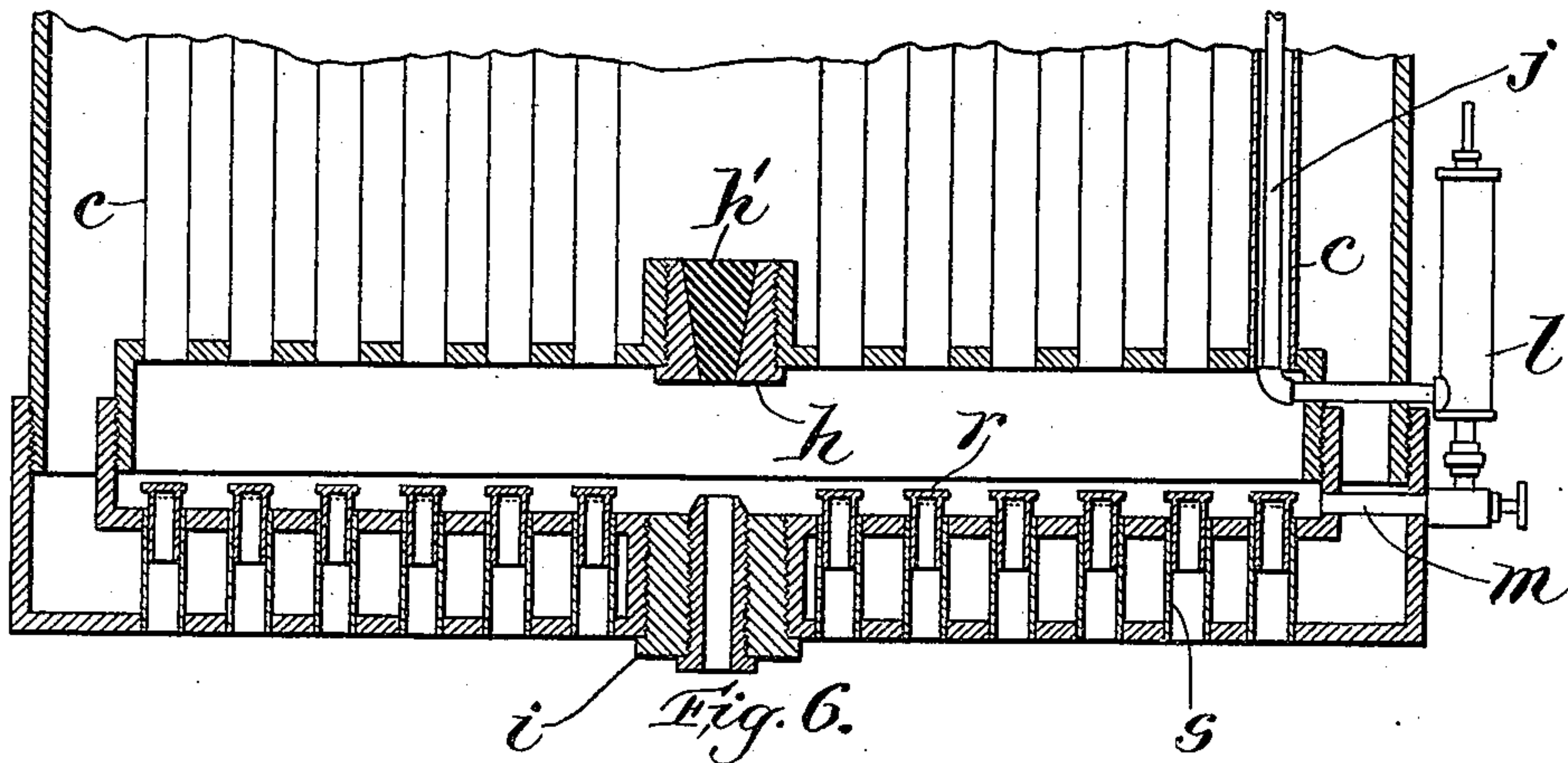
Patented Nov. 20, 1900.

L. J. HARRIS.
STEAM BOILER.

(Application filed June 21, 1900.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

Arthur D. Randall
Ernest L. Sturms

Inventor:

Louise J. Harris

by Geo. N. Godelard
Attorney.

UNITED STATES PATENT OFFICE.

LOUIE J. HARRIS, OF BOSTON, MASSACHUSETTS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 662,232, dated November 20, 1900.

Application filed June 21, 1900. Serial No. 21,069. (No model.)

To all whom it may concern:

Be it known that I, LOUIE J. HARRIS, a citizen of the United States, and a resident of Boston, county of Suffolk, Massachusetts, have
5 invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to steam boilers or generators and is intended to provide certain improvements by which the economy, safety,
10 and convenience of steam-boilers, and particularly those of the portable class, may be greatly increased.

One of the features which characterize my
15 invention is the use of a baffle-plate in the water-space of the boiler for the purpose of preventing the water from dashing into the upper part of the water-space in which the steam collects, thereby lessening the tendency
20 to complete saturation, besides protecting the head against the surging movement of the water when the boiler is carried in a moving vehicle.

Another feature which characterizes this invention resides in providing a construction
25 by which I form a completely-inclosed fire-box adapted to receive any suitable hydrocarbon or other burner and to permit the flow of water entirely around said fire-box, while
30 at the same time admitting abundant supplies of air to support combustion.

Still another feature resides in providing, in connection with the fusible plug in the crown-sheet, a convenient arrangement for with-
35 drawing said plug and supplying a new one whenever it is desired to make such a change.

An additional feature which is applicable to boilers in which a hydrocarbon-burner is used consists in leading the oil-supply pipe
40 through the interior of the boiler, so as to pre-heat the oil before it passes into the burner, which arrangement facilitates combustion.

These and other features will be more particularly described in the following specification, and will be set forth in the claims annexed thereto.
45

In the drawings I have indicated several of the forms under which my invention may be embodied.

50 Figure 1 is a vertical central section of my

improved boiler. Fig. 2 is a side elevation thereof. Fig. 3 is a plan view of the bottom section with the hydrocarbon-burner resting therein. Fig. 4 is a central section of the lower part of a modified construction. Fig. 5
55 is a plan view thereof. Fig. 6 is a central vertical section of the lower part, showing the oil-supply pipe passed through one of the flues of the boiler. Fig. 7 is a detail of one of the air-inlet tubes. Fig. 8 is a detail of a
60 modified form of air-inlet tube.

In its main features the boiler shown comprises an external shell *a*, to which is secured, detachable or otherwise, a head *b*, into which
65 the upper ends of the hot-air flues *c* are secured, the lower ends of said hot-air flues being secured to the crown-sheet *d*. A hood or casing *e*, secured above the head *b*, forms an inclosed smoke box or passage through which the steam offtake-pipe *f* extends, the leading
70 of the steam-pipe *f* through said smoke-box tending to superheat and drive the steam. Secured to the lower end of the shell *a* and the crown-sheet *d* is a hollow bottom section comprising the outer casing or plate *g* and the
75 inner casing or plate *g'*, which are connected by a series of short air-admission tubes *g*². This bottom section for convenience is preferably detachably secured to the shell and crown-sheet, as shown in Fig. 1. The con-
80 nection between the depending flange and the crown-sheet and the inner section is a screw-threaded connection, while the outer section is bolted or riveted to the shell *a* by means of bolts passing through two opposing flanges. 85
This construction affords the freest communication between the main part of the boiler and the hollow bottom.

In Figs. 4 and 5 I have shown a somewhat different construction in which both the
90 crown-sheet and the inner section are provided with horizontal inner flanges *d'* *g*⁴, which are perforated in any suitable manner to allow the circulation of water from the bottom of the main section. In this case fastening-
95 bolts *a'* pass through these two flanges on the shell and on the outer section of the hollow bottom.

Still another modification is shown in Fig. 6, in which both the inner and outer sections 100

of the hollow bottom have a screw-threaded connection, respectively, with the crown-sheet and the shell *a*.

In order to form a safety blow-off for the boiler, I provide the crown-sheet with a large perforation into which is closely fitted a removable perforated plug *h*, the perforation in said plug being normally filled with some easily-fusible metal, so that when the water in the boiler falls below the highest point of the crown-sheet the increased temperature results in melting the fusible part or stopper *h'* of the perforated plug *h*, so as to afford a large vent for the steam. That part of the bottom section which lies immediately beneath the fusible plug is provided with an orifice of larger diameter than the plug *h*, which opening is usually partially closed by a removable perforated plug *i*. The perforation in the plug *i* is intended to afford a small passage through which a match or taper may be thrust to ignite the hydrocarbon. When it is desired to remove the plug *h* or to get access to the interior of the fire-box, the large plug *i* may be taken out, thus leaving a hand-hole through which access is afforded to the fire-box.

I have shown in Fig. 6 the oil-supply pipe *j* passing through one of the flues *c* of the boiler. As shown, this supply-pipe leads to the supply-reservoir *l*, through which the oil passes into the feed-pipe *m* of the burner *n*.

In order to prevent the water in the boiler from rushing through the top part thereof, in which the steam collects, as well as to protect the head *b* from an impact of the water, I provide a baffle-plate *o*, through which the flues *c* pass.

For regulating the admission of air to the fire-box or combustion-chamber I may provide various kinds of perforated heads or nozzles *r*. These nozzles may be removed if it is desired to secure a greater inflow of air than they permit or can be restored if the burner does not require so large an air-supply. In Figs. 7 and 8 I have shown modified forms of these nozzles *r'* and *r''* with different modes of securing them in the air-inlet tubes *s*.

It will be noticed that all the principal parts of my boiler are made separable or detachable from the others. Such construction and arrangement not only permit the quick replacement of an injured or broken part, but

allow the attendant to readily gain access to any part of the boiler to make repairs or for other purposes.

Return-pipe *t* may, as shown, pass through the interior of the boiler and deliver its contents at the lower end thereof close to the fire-box, this arrangement serving to keep returning water or condensation at a high temperature.

Without having attempted to describe all the variations in form, construction, and arrangement that may be made in my invention, what I claim is—

1. In a steam-boiler the main section having a crown-sheet containing a removable plug combined with a bottom section provided with an orifice of greater diameter than said plug, and having a perforated plug for partially closing said orifice, substantially as described.

2. In a steam-boiler the combination of the crown-sheet forming the top of the fire-box, a removable plug fitted into said crown-sheet, a hollow bottom section forming the floor of said fire-box, said bottom section being provided with a perforated plug of larger diameter than the diameter of the plug in the crown-sheet, substantially as described.

3. In a steam-boiler the combination of the main section, comprising the shell, the head, the crown-sheet and the hot-air flues, and the lower section comprising the inner and outer plates forming a chamber in communication with the main section and air-flues connecting said plates, substantially as described.

4. In a steam-boiler the combination of the main section comprising a water-chamber, and a hollow bottom section forming a supplementary water-chamber inclosing the fire-box, said bottom section being provided with air-inlet tubes, substantially as described.

5. In a boiler the combination of the outer shell, the crown-sheet, of the lower section comprising an outer and an inner plate said plates being connected by means of air-admission flues, and being detachably secured to the shell and to the crown-sheet respectively, substantially as described.

In witness whereof I have hereunto set my hand this 15th day of June, 1900.

LOUIE J. HARRIS.

In presence of—

ALFRED SPEAR,
LUTHER M. HARRIS.