

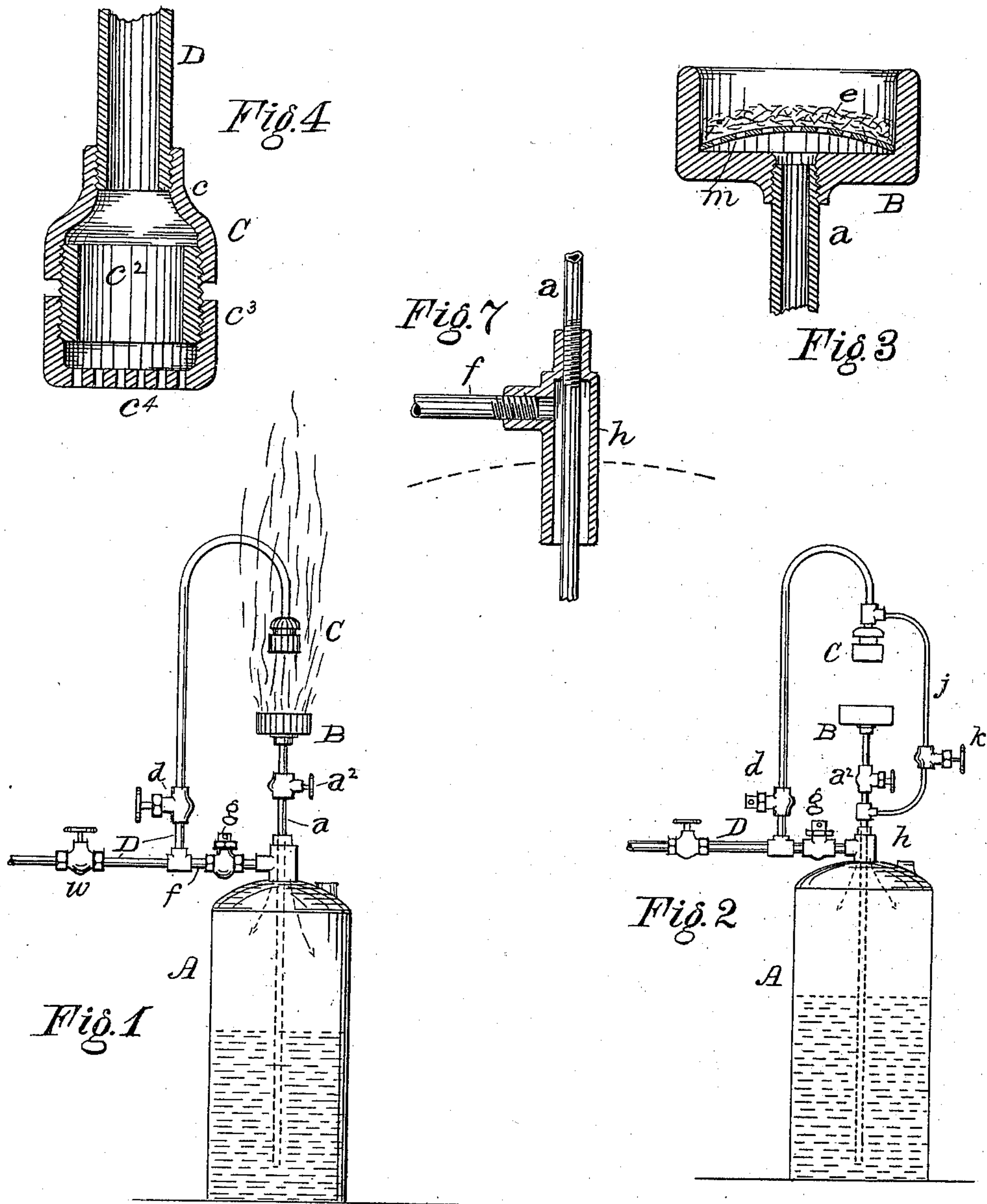
(No Model.)

2 Sheets—Sheet 1.

W. H. WHEELER.
OIL BURNING APPARATUS.

No. 598,667.

Patented Feb. 8, 1898.



Witnesses:

L. J. Randall.
Soren Puntis

Inventor:

William H. Wheeler
by *C. M. Ward*
Attorney.

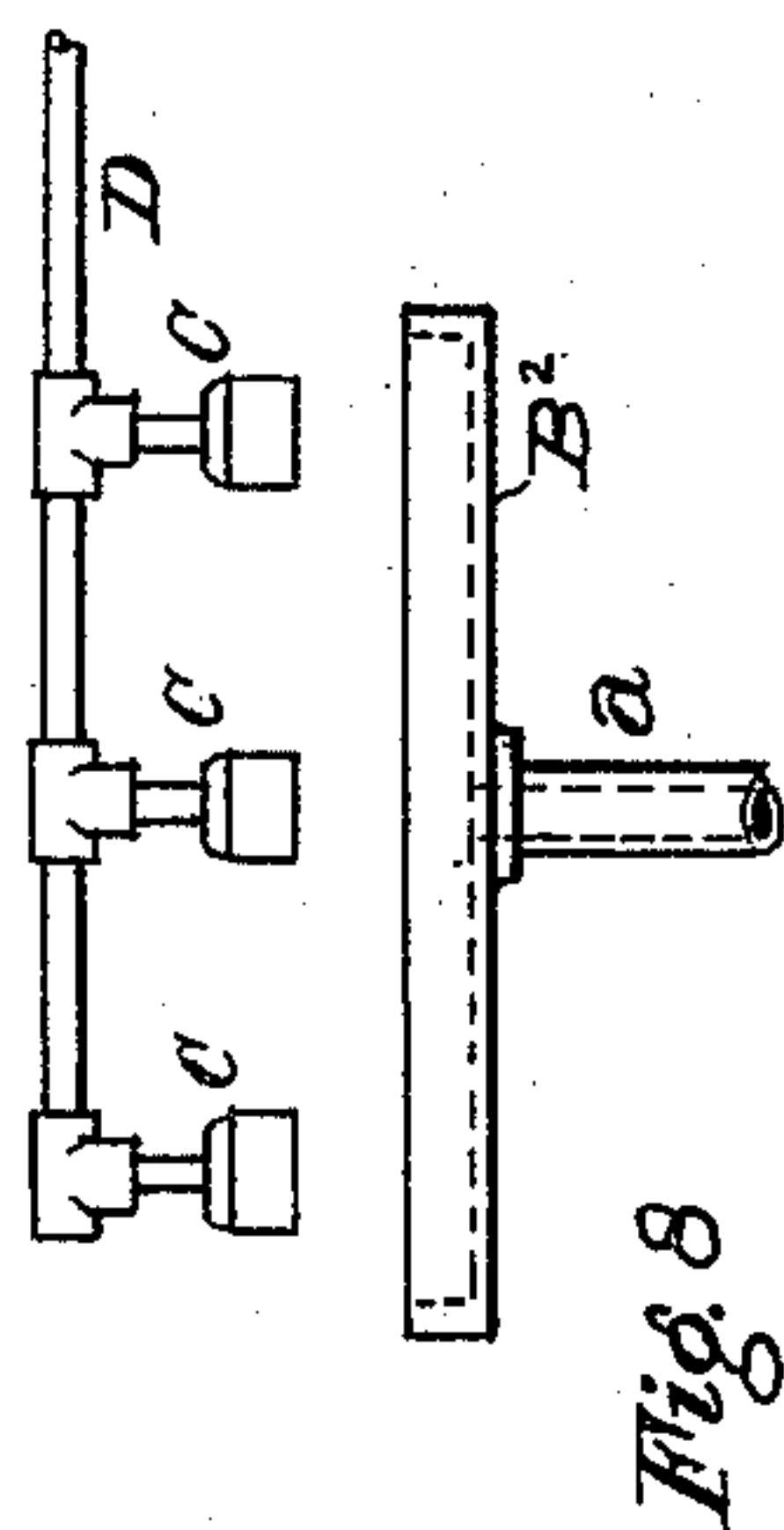
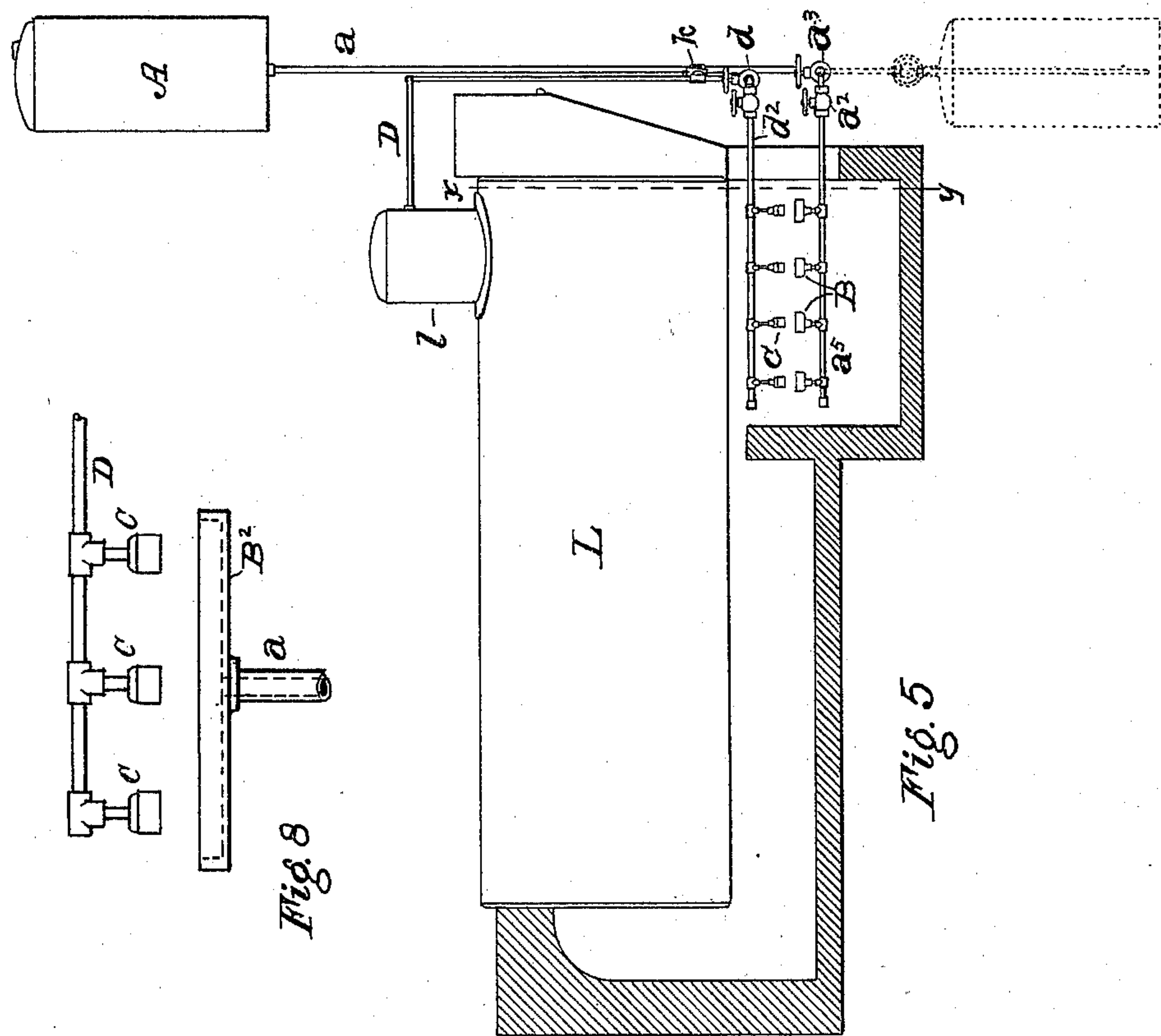
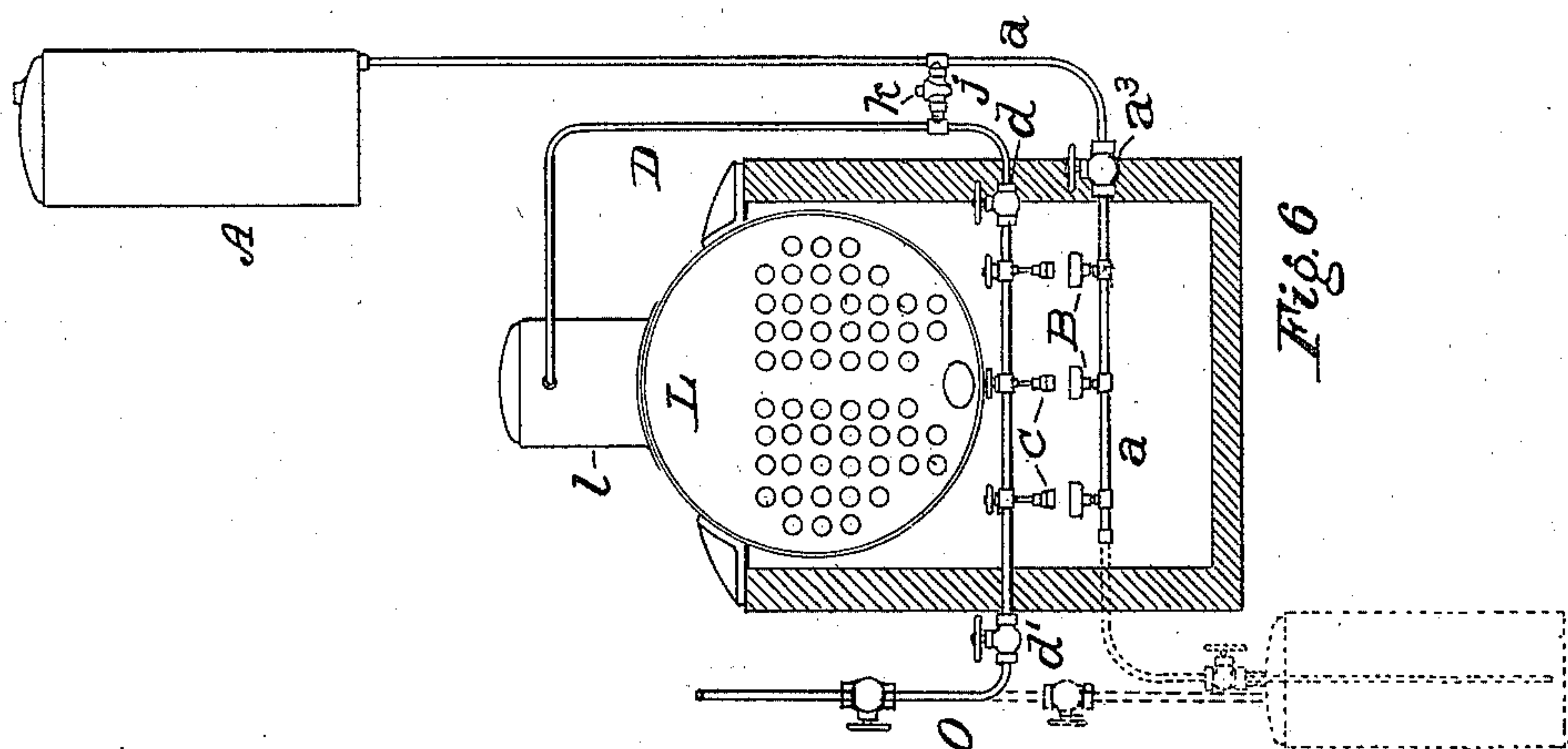
(No Model.)

2 Sheets—Sheet 2.

W. H. WHEELER.
OIL BURNING APPARATUS.

No. 598,667.

Patented Feb. 8, 1898.



Witnesses:
Lam. Proutis
H. B. Cavanaugh.

Inventor:
William H. Wheeler
by O. W. Vorce
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM H. WHEELER, OF CLEVELAND, OHIO.

OIL-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 598,667, dated February 8, 1898.

Application filed February 19, 1897. Serial No. 624,268. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WHEELER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Oil-Burning Apparatus; 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.

My invention relates to improvements in apparatus for burning oil, both for lighting and heating purposes.

The object of the invention is to secure increased efficiency, simplicity, and cheapness of the apparatus, certainty in its operation, and to widen its applicability; and the invention consists in the novel features of construction, arrangement, and combination of the apparatus, as hereinafter fully described, and pointed out in the claims.

In the drawings hereto annexed, Figure 1 represents in elevation my improved apparatus as employed for lighting. Fig. 2 is a similar view representing a modified form of the apparatus. Fig. 3 is a detached view in section of the burner proper. Fig. 4 is a like view of the air-spray. Fig. 5 is a side view, in elevation and partial section, of a steam-boiler having my improved burner applied to the heating thereof. Fig. 6 is an end view of the apparatus shown in Fig. 5 in section on the line *xy* of Fig. 5. Fig. 7 is a detached view of the sleeve *h*, feed-pipe *a*, and pressure-pipe *f*, adapted for connection to an oil-barrel; and Fig. 8 is a detached view showing a modification of the burner and its adaptation to use with a plurality of air or steam sprays.

My improved apparatus consists, essentially, of a burner connected to an oil-supply from which, either by gravity or by pressure, the oil is fed to the burner, and a jet or spray from which air or steam under pressure is made to impinge directly upon and against the oil burning at the burner-mouth.

Referring to the drawings, A represents the oil-supply tank; B, the burner; C, the air or steam spray, and D the supply-pipe from any suitable source of air or steam pressure, as a blower, air-compressor, or boiler. From

near the bottom of the supply-tank A a feed-pipe *a* extends to and enters the bottom of the cup-like burner B, being provided with a stop-cock *a*². Through the pipe D air under pressure is conveyed to the jet or spray C, which is preferably arranged in direct axial alinement with the burner, as shown, and at a distance of but a few inches therefrom, which distance may vary a little according to the amount of pressure to be employed. Oil passes by pipe *a* into the burner, saturating the asbestos or similar incombustible wick *e*, and on being lighted burns, while air escaping from the spray C accelerates the flame and increases its luminous properties. As this spray C is heated up a fuller supply of air, regulated by a cock, as *d*, in the air-supply pipe D, is turned on, still further accelerating the combustion, and very speedily a large white and very luminous flame is obtained. A connection from the air or steam supply to the top of the tank A is made when the gravity-feed is not used, and by means of a cock in such connection just enough pressure is admitted to the oil-supply tank to force the oil through the feed-pipe to the burner. In Fig. 1 such a connection is shown, the pipe *f*, provided with cock *g*, connecting pipe D with a sleeve or T *h*, which communicates with the interior of tank A; but it is obvious that the connection might be a separate and independent pipe extending from the pressure-supply to the tank A. The arrangement shown in Fig. 1 is preferred, for the reason that it affords a convenient regulation of the feed of oil and of the air-spray. By means of cock *g* the pressure on the oil in tank A can be very exactly regulated and the rate of feed of the oil maintained constant. By a cock *d* in pipe D the air passing to spray C can also be exactly regulated. In practice it is found convenient to employ a valve *w* in the supply-pipe D nearer to the source of the pressure than the cocks *d* and *g* to leave them undisturbed and use only valve *w* for turning on or cutting off the pressure.

The sleeve or T *h* may be permanently affixed to the tank A or may be inserted into the same removably, as by a screw-threaded union, and I contemplate also making the sleeve of a length to enable it to be driven into the bung-hole of a barrel or like vessel,

as shown in Fig. 7, in which the dotted line indicates the side of the barrel. By this means the light can be used without being affixed to any permanent tank, an ordinary oil-barrel serving as the oil-supply, which is convenient for portability in many cases, as on ore-docks, coal-yards, wharves, &c.

By inserting a perforated convex diaphragm *m* beneath the incombustible fibrous wick *e* in the burner B, as shown in Fig. 3, a better and more uniform saturation of the wick is obtained.

The air-spray C may be an integral structure; but I prefer to construct it as is shown in Fig. 4, in which *c*² represents a sleeve threaded into the base *c* of the air-chamber, and the perforated cap *c*³ is threaded into or upon the sleeve *c*². By this construction not only is the cap *c*³ capable of some adjustment, but it is readily removable for cleaning out the perforations *c*⁴ and the removing of any dust accumulating in the chamber.

It is obvious that by taking off a branch from the feed-pipe *a* and a branch from the air or steam supply pipe D, the branches being terminated, respectively, by a burner and an air-spray, another burner could be arranged beside or at any distance from the first, and an indefinite number of burners could thus be maintained by the single feed-pipe, substantially as illustrated in Figs. 5 and 6.

It is also a part of my invention to make the burner in the form of a trough or box more or less laterally expanded and to arrange a number of the nozzles C above this, so that all may discharge air or steam upon the single trough-like burner, as shown in Fig. 8.

Although I have shown the air-spray as axially alined with the burner in all the figures, I do not mean to confine myself rigidly to a strictly axial alinement of the two, as they may be somewhat displaced laterally from exact alinement or even somewhat inclined at an angle without wholly sacrificing the advantages of my arrangements or departing from my invention, but I regard the direct alinement of the two as preferable.

In applying my improved burner to the heating of boilers, furnaces, ovens, &c., I prefer to arrange the burners in battery, as seen in Fig. 5, a number of separate burners being arranged on the same branch feed-pipe *a*⁵, which in such cases is disposed horizontally, and two, three, or more of the pipes *a*⁵ being taken off from the feed-pipe *a*, as may be required. The steam or air pressure pipe is provided with corresponding branches *d*², on which the air-sprays C are arranged to correspond with the burners, as shown. An air-pressure pipe O is also preferably provided, as seen in Fig. 6, which may conveniently enter the pipe D at its extremity or may be merely a prolongation thereof, as shown, extending to an air-pressure supply, as a blower, &c. By this arrangement the feed of oil may be by pressure, the tank A being lower than

the burners and having the pressure connection *f* and valve *g*, as shown in dotted lines in Figs. 5 and 6. When starting the burners under the boiler or furnace thus arranged, the valve *d* may be closed and air from the pipe O blown through valve *d*' at the outset, and as the burners and air-sprays become heated up steam may be gradually turned on through pressure-pipe D and valve *d*, and eventually, if desired, valve *d*' may be nearly or even quite closed and the combustion continued with the steam alone. I consider it preferable, however, to use air with the steam and to employ air alone rather than steam alone.

Where the burner is required to start very quickly either for lighting or heating, I prefer to provide the by-pass *j* from the feed-pipe *a* between the tank A and valve *a*² to the pipe D near the air-spray. By slightly opening a valve *k* in the by-pass *j* a small quantity of oil will be blown out with the air-spray and will burn fiercely when lighted, thus almost immediately heating the burner B, so that the by-pass may be closed and the burners operated at full capacity alone. Although the burner B will operate very effectively without the wick *e*, I prefer to use it, as it prevents any splashing or spattering of the oil by the blast of air from the spray C and causes the flame to burn more quietly; also, the oil with which the wick is saturated burns for some few minutes after the air-pressure is cut off, so that in case of accidental failure of the air or steam pressure the light does not instantly go out, as it does in other burners employing air or steam pressure, but burns long enough to enable other lights to be substituted or in many cases to enable repairs to the pressure-supply to be made, so that the light does not wholly cease and interruption of work is often avoided. This also enables the sleeve *h* to be separated from one tank or barrel and transferred to another without any interruption of the light.

What I claim as my invention is—

1. An oil-burning apparatus comprising a cup-like or tubular burner, a connection therefrom to an oil-supply, a nozzle or spray located near to and opposite the mouth of said burner and discharging toward the same, and a connection from said nozzle to an air or steam forcing device, substantially as described.

2. In an oil-burning apparatus the combination of a cup-like or tubular burner, an oil-supply connected therewith, a nozzle or spray fixed opposite said burner and in substantially axial alinement therewith, and discharging toward the same a source of air or steam pressure, and a connection therefrom to said nozzle and to said oil-supply, substantially as described.

3. In an oil-burning apparatus the combination of a cup-like or tubular burner and an air or steam nozzle in axial alinement opposite each other mouth to mouth, an oil-supply connected to said burner, a source of air or

steam pressure connected to said nozzle and to the oil-supply, and a valved by-pass from said oil-supply connection to said air-pressure connection, substantially as described.

5 4. In an oil-burning apparatus the combination of an oil-supply tank, a sleeve inserted therein, a feed-pipe passing through said sleeve and terminating in a burner, a nozzle or spray opposite to and in substantially axial
10 alinement with said burner and discharging

toward the same, a source of air or steam pressure, and a connection therefrom to said nozzle and to said sleeve, substantially as described.

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

WILLIAM H. WHEELER.

Witnesses:

H. B. CAVANAUGH,
JOHN N. WYLER.