

(No Model.)

2 Sheets—Sheet 1.

G. P. WAY.
OIL BURNER.

No. 436,816.

Patented Sept. 23, 1890.

Fig. 1

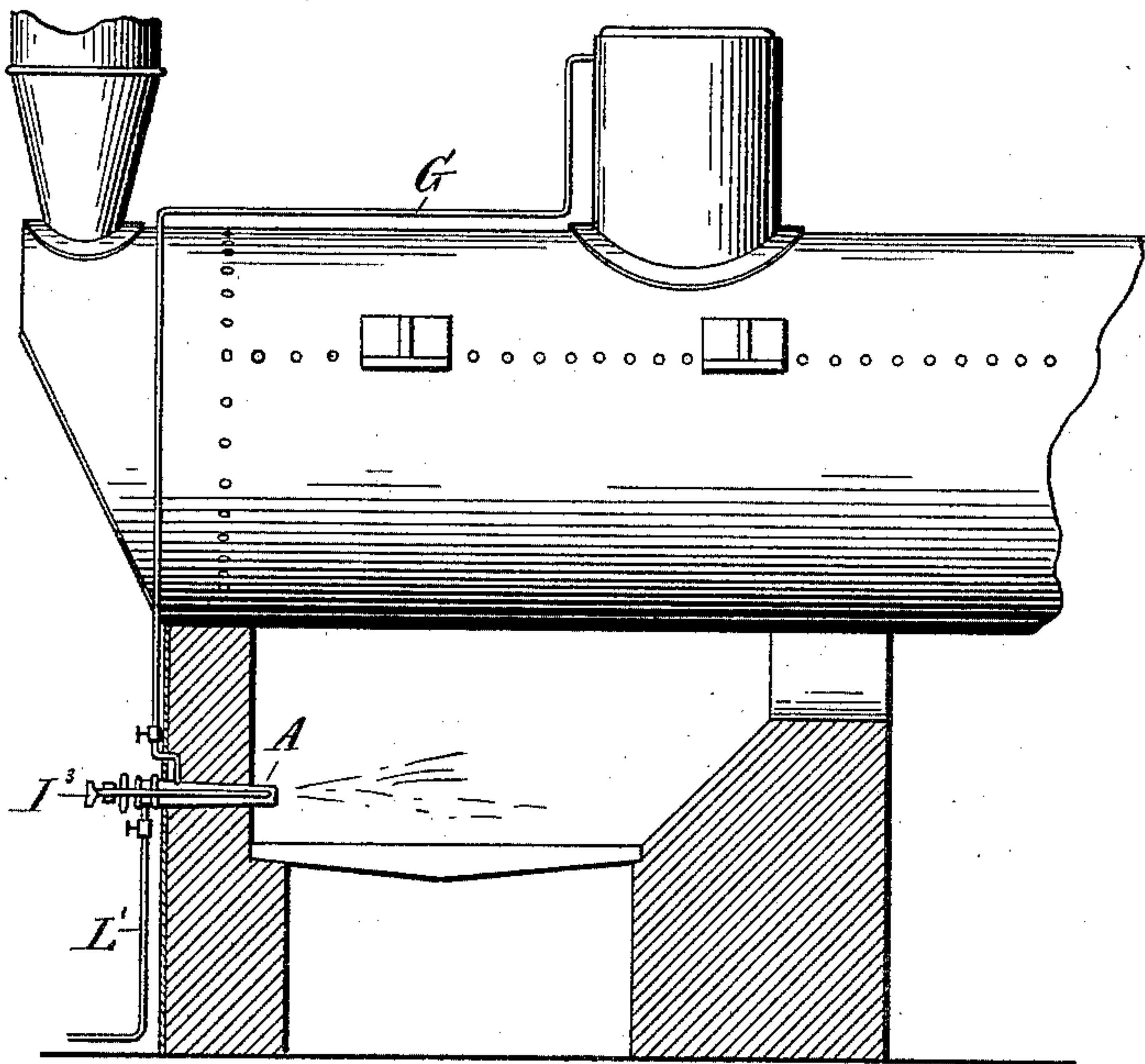


Fig. 4

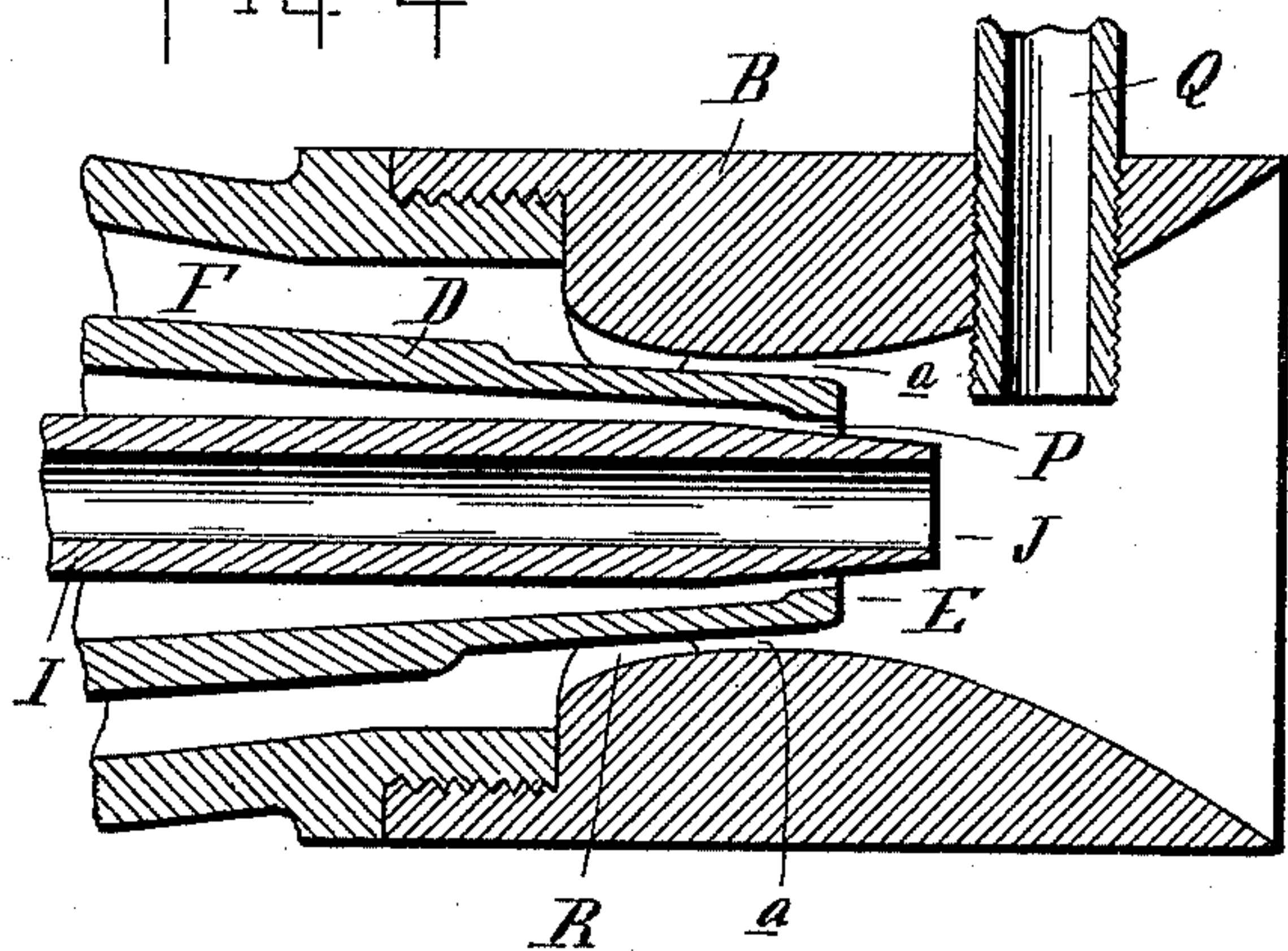
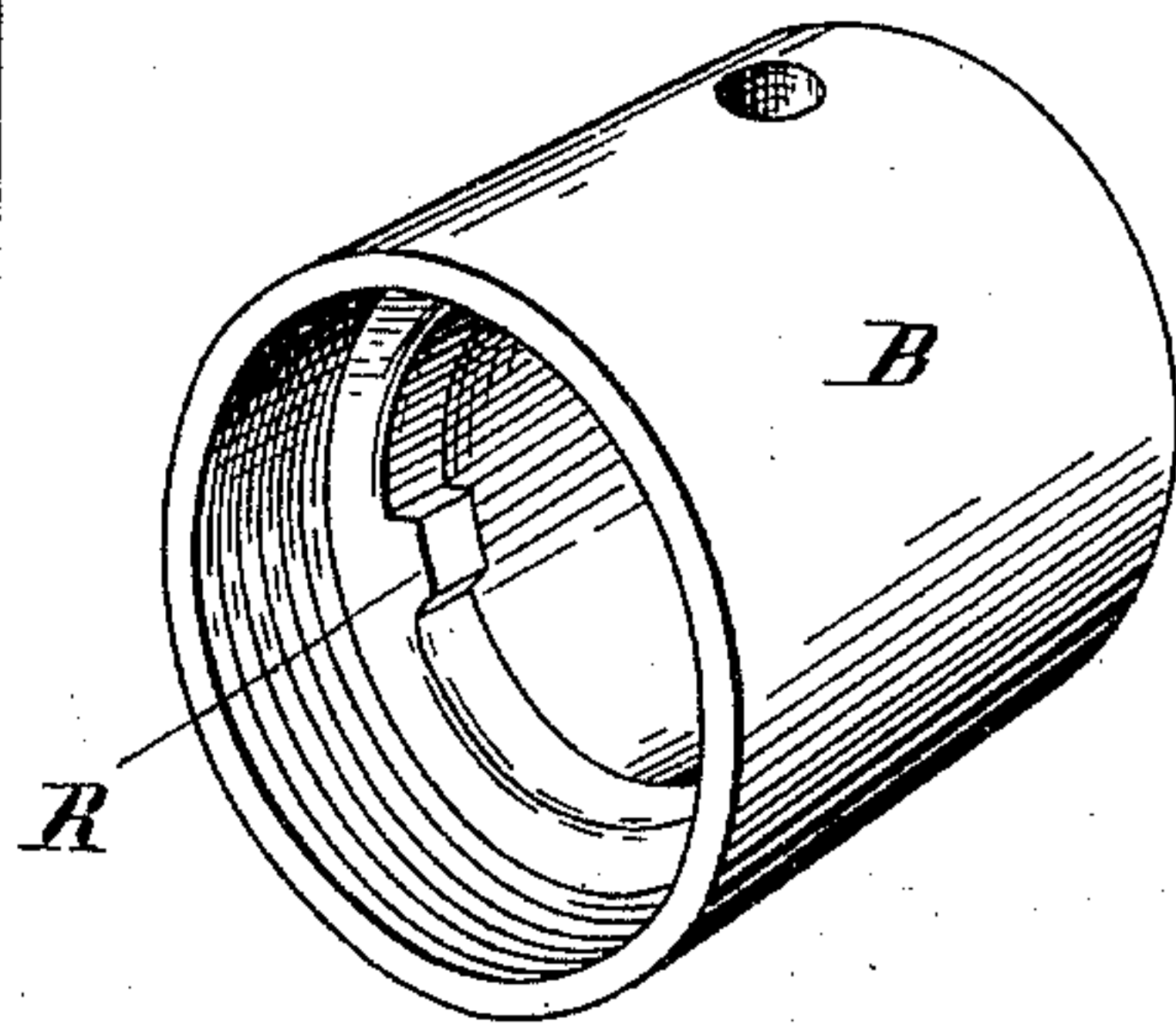


Fig. 5



Witnesses:

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Inventor:

George F. Way

By James Whittemore
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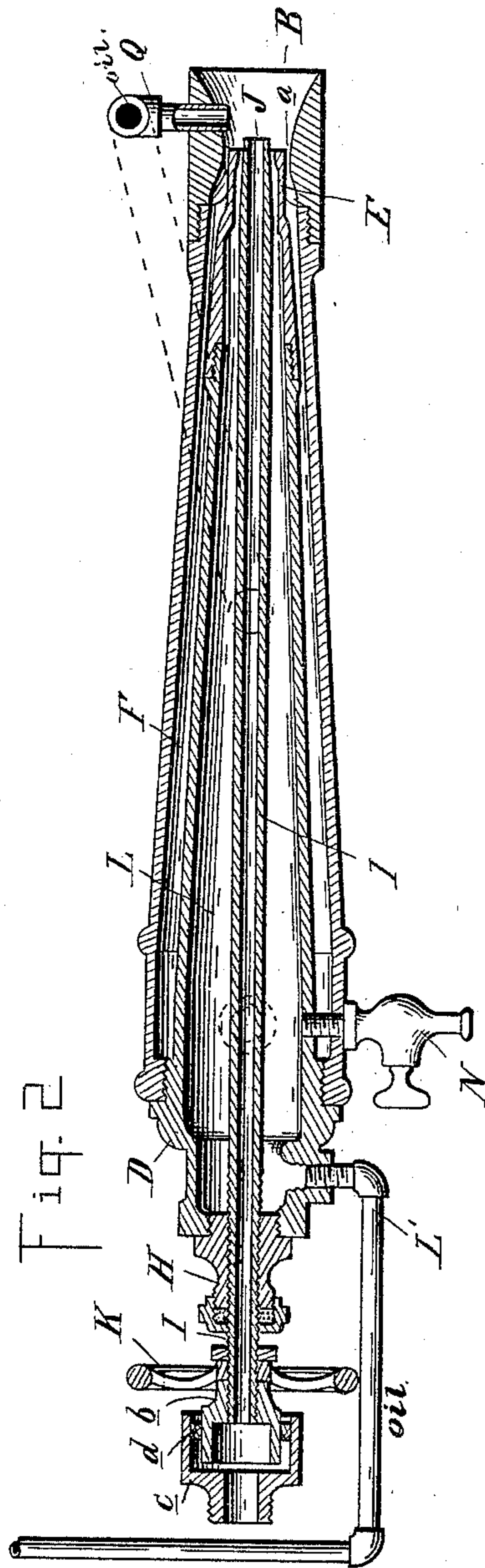
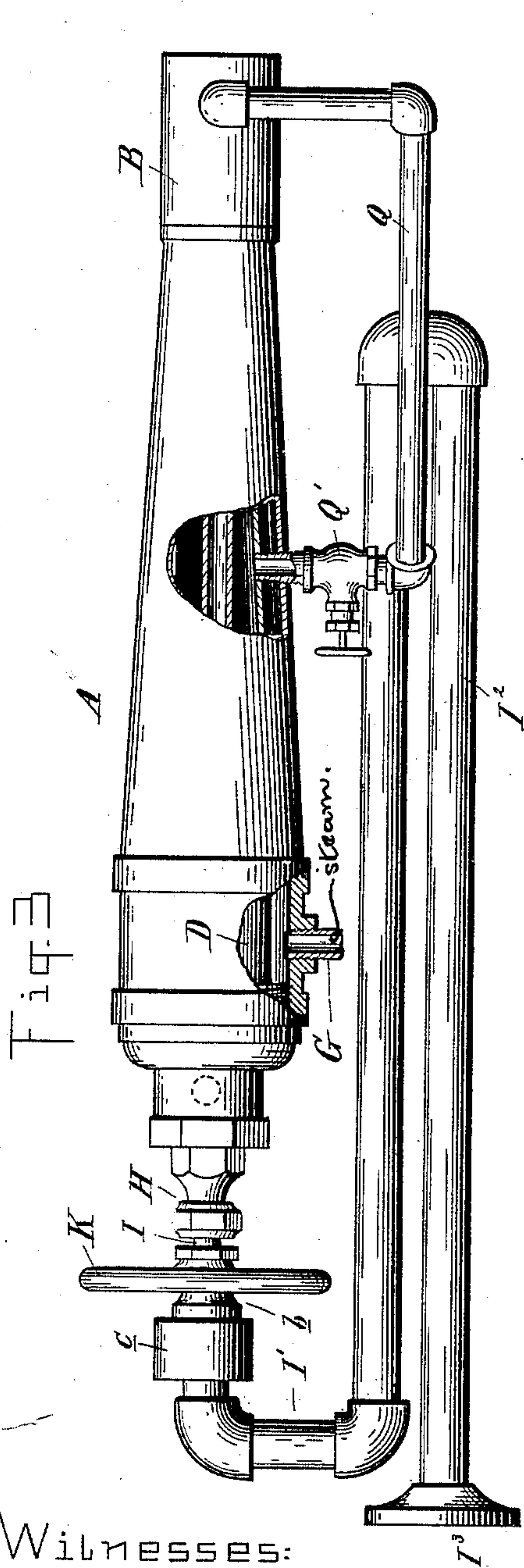
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2 Sheets—Sheet 2.

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No. 436,816.

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Geo. A. Gregg

Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE P. WAY, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO
THEODORE S. CLINE, OF SAME PLACE.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 436,816, dated September 23, 1890.

Application filed December 14, 1889. Serial No. 333,825. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. WAY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in oil-burners; and the invention consists in the peculiar construction, arrangement, and combination of the parts, all as more fully hereinafter described and shown.

In the drawings which accompany this specification, Figure 1 is a section through a furnace to which my improved burner is applied. Fig. 2 is a vertical central longitudinal section through the burner detached. Fig. 3 is an enlarged plan view of the burner detached, partly in section. Fig. 4 shows a portion of Fig. 2 on a larger scale, and Fig. 5 is a rear perspective view of the nozzle.

My burner belongs to that class in which oil, steam, and air are used for fuel.

A is a tapering conical outer casing having a nozzle B, detachably secured thereto at its inner end, preferably by means of the screw-thread.

D is a conical tapering inner casing secured within the outer casing by means of a screw-thread at its rear end and provided at its forward end with the nozzle E, projecting within the nozzle B. This inner casing, with its nozzle, is of sufficient smaller diameter than the outer casing to form an annular chamber F between the two, closed at its rear end and open at the front end within the nozzle B. This space is preferably contracted toward the forward end and communicates with the interior of the nozzle through the annular opening *a*. At its rear end it is provided with an aperture, in which is secured the steam-pipe G, connected at the other end to any suitable source of steam. The rear end of the inner shell projects beyond the outer shell A and is closed by a plug or stuffing-box H.

I is a hollow screw-threaded stem projecting through the stuffing-box H and through the chamber L within the casing D, provided at its forward end with the tapering point or nozzle J, extending through the nozzle E. The rear end of this stem is provided with a han-

ble K for adjusting it in or out and with the sleeve *b*, which loosely engages in an outer sleeve *c*, a packing *d* being placed between to form a slip-joint between the stationary supply-pipe I' and the stem I. This stationary air-pipe I' is preferably provided with a coil I², extended into the furnace beside the burner, and at its outer end with a bell-shaped mouth I³.

L' is the oil-supply pipe secured in a suitable aperture in the rear end of the casing D and communicates with the chamber L.

N is a drip-valve connected with the chamber L of the inner shell at or near its lowest point.

Q is an auxiliary oil-supply pipe connecting at one end with the oil-chamber L about midway its length and at the other end extended into the nozzle B at a point beyond the ends of the inner tubes. This feed-pipe is controlled by a suitable valve Q'.

The parts being thus constructed and arranged, they are intended to operate as follows: Steam is admitted through the pipe G into the chamber F and forces its way out through the contracted annular orifice *a* between the nozzle B and nozzle E. Beyond this orifice the bore of the nozzle B enlarges, thereby allowing the steam issuing to freely expand. This naturally creates a suction, which draws in the air through the hollow stem I, which is open at its rear end, and the air, in passing through the coil I² in the furnace, will become considerably heated. The oil is now turned on and is fed by a pump or by gravity through the pipe L' into the chamber L. The force of the suction of the steam or the gravity feed will force the oil through the annular orifice P, formed between the outer nozzle J of the air and the nozzle E of the inner casing. It is evident that the amount of oil fed to this aperture may be regulated by operating the handle K and thereby moving in or out the stem I, the amount of steam fed being regulated by a suitable valve placed in the steam-pipe.

By making the device relatively long it will be seen that the oil in the oil-chamber L becomes subjected to a considerable heat from the steam outside and heated air inside before it is ejected, and at the point of ejection it is caught between the blast of air in the center

and the blast of steam on the outside and thereby vaporizes and forms a combustible mixture, which burns without smoke.

Where it is desirable to have a low fire, it
5 has been found difficult to feed oil through the annular orifice P in sufficiently small quantities to burn all that would pass through, and I provide for such contingencies by constructing the auxiliary oil-supply Q, which will
10 feed by gravity as small amount of oil as is desired into the path of the steam and air blast, and when this is in use the orifice P may be closed by screwing the stem I, so that the tapered seat formed on the end thereof has a
15 bearing against the inner edge of the casing B.

To center the nozzle E within the nozzle B, I preferably provide supporting-studs R within the nozzle, and, if necessary, the stem I may be centered with the nozzle E in the same
20 manner. I preferably make the nozzles B and E detachable for the purpose of changing them for new nozzles if a different flame is required and also to fit and repair more easily.

In burners of similar construction a constant source of annoyance arises from the accumulation of sediment or water in the oil-chamber, which seriously affected the proper working of the burner. To overcome this, I have arranged a drip-pipe N, by means of
30 which I can from time to time remove the water separating from the oil without difficulty.

What I claim as my invention is—

In an oil-burner, the combination, with the
35 outer and the inner casing forming a steam and oil chamber, of a nozzle on the end of the outer casing, an oil-supply pipe leading into the inner or oil chamber, and an auxiliary oil-pipe leading out from the oil-chamber into
40 the nozzle, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 23d day of October, 1889.

GEORGE P. WAY.

Witnesses:

P. M. HULBERT,
GEO. A. GREGG.