

No. 884,286.

PATENTED APR. 7, 1908.

J. O. MORGAN.  
BURNER.

APPLICATION FILED JULY 18, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

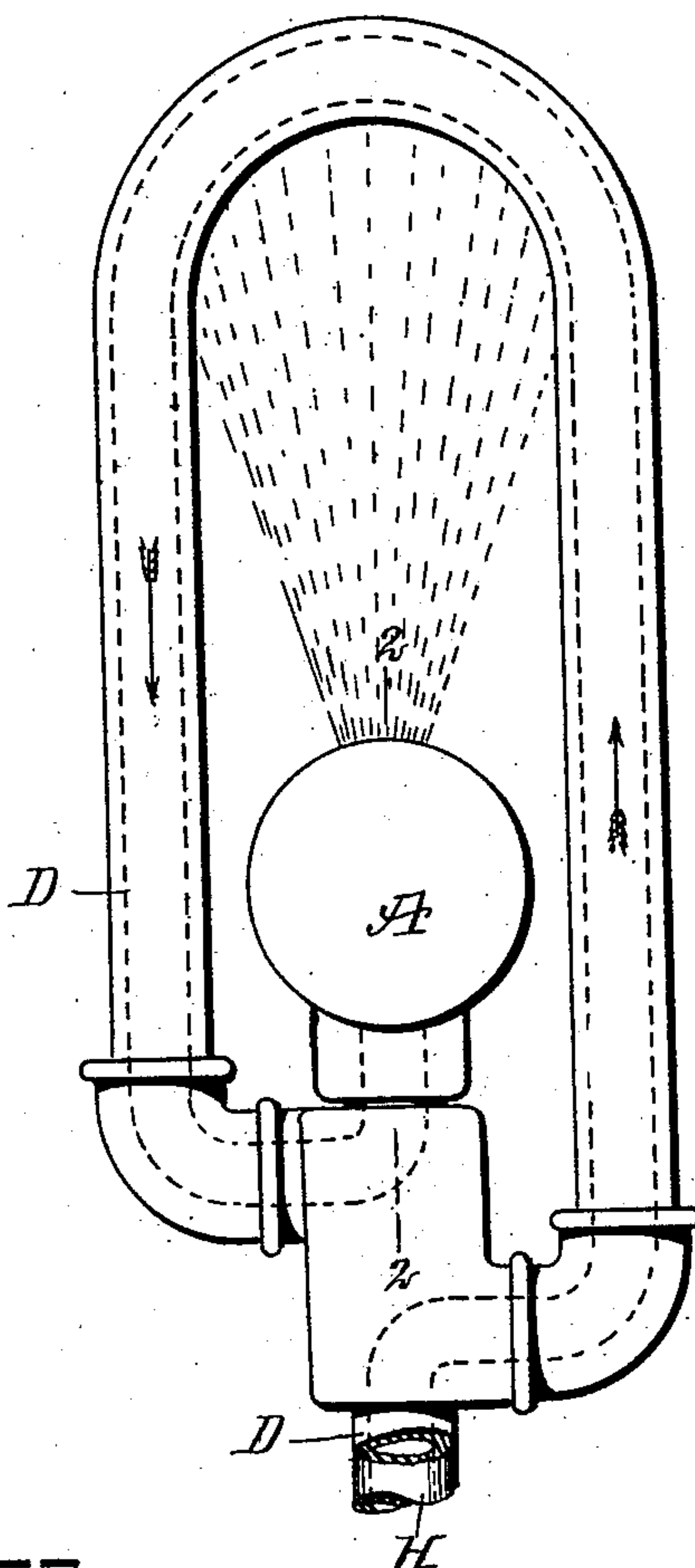
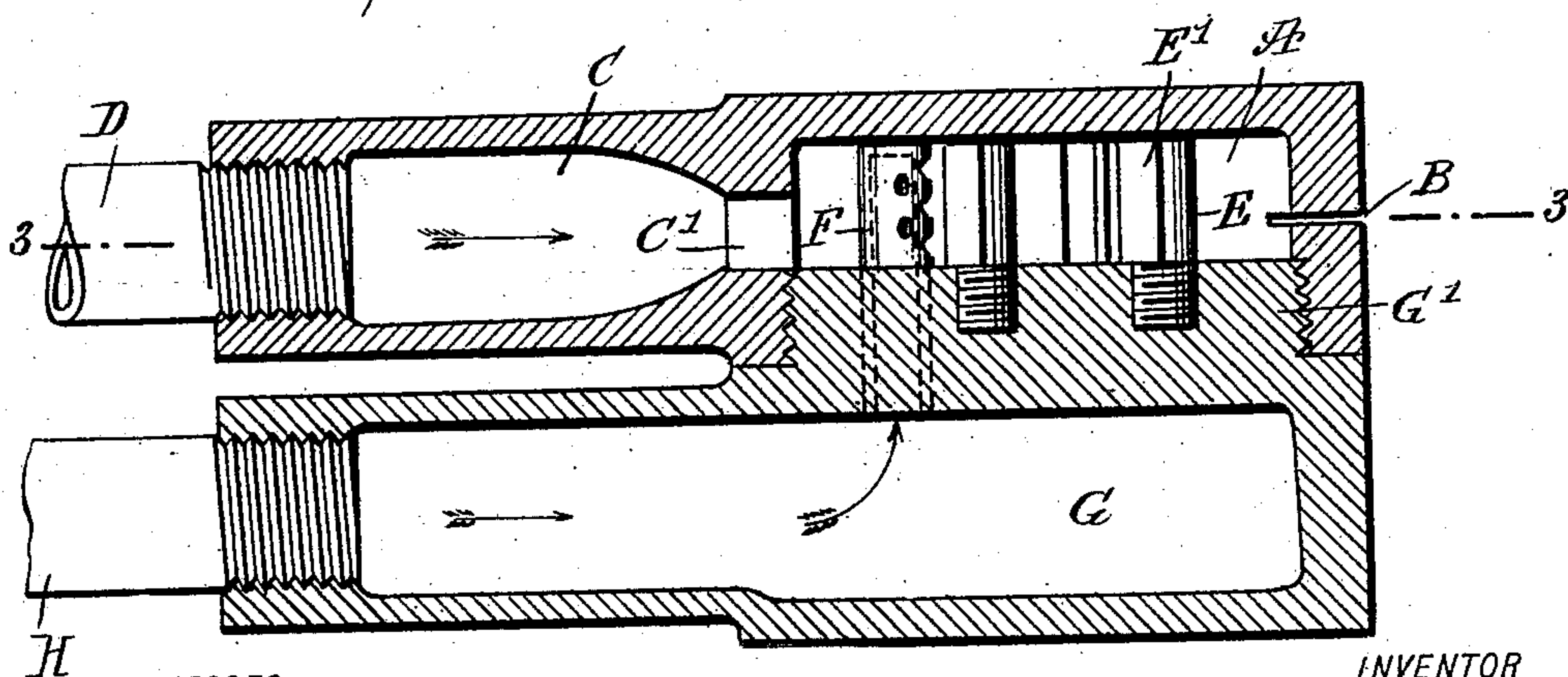


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

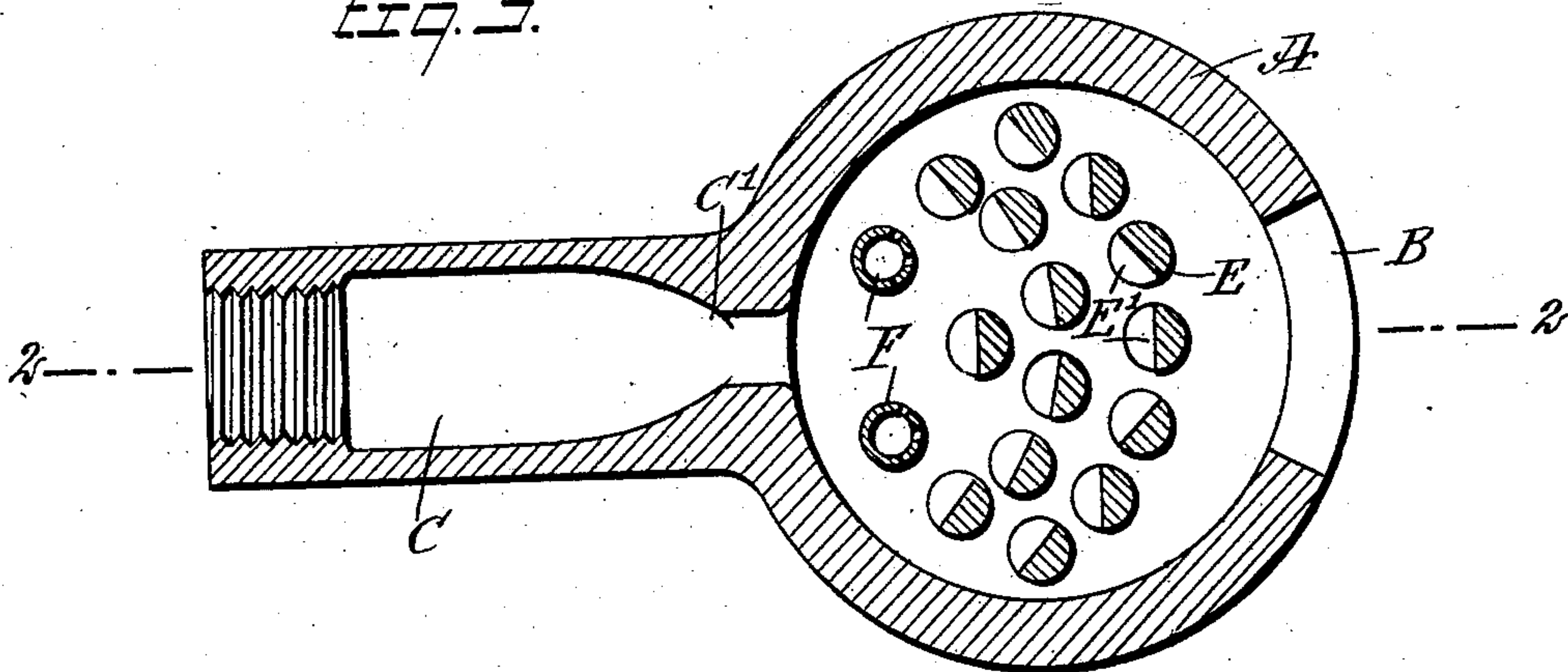


Fig. 4.

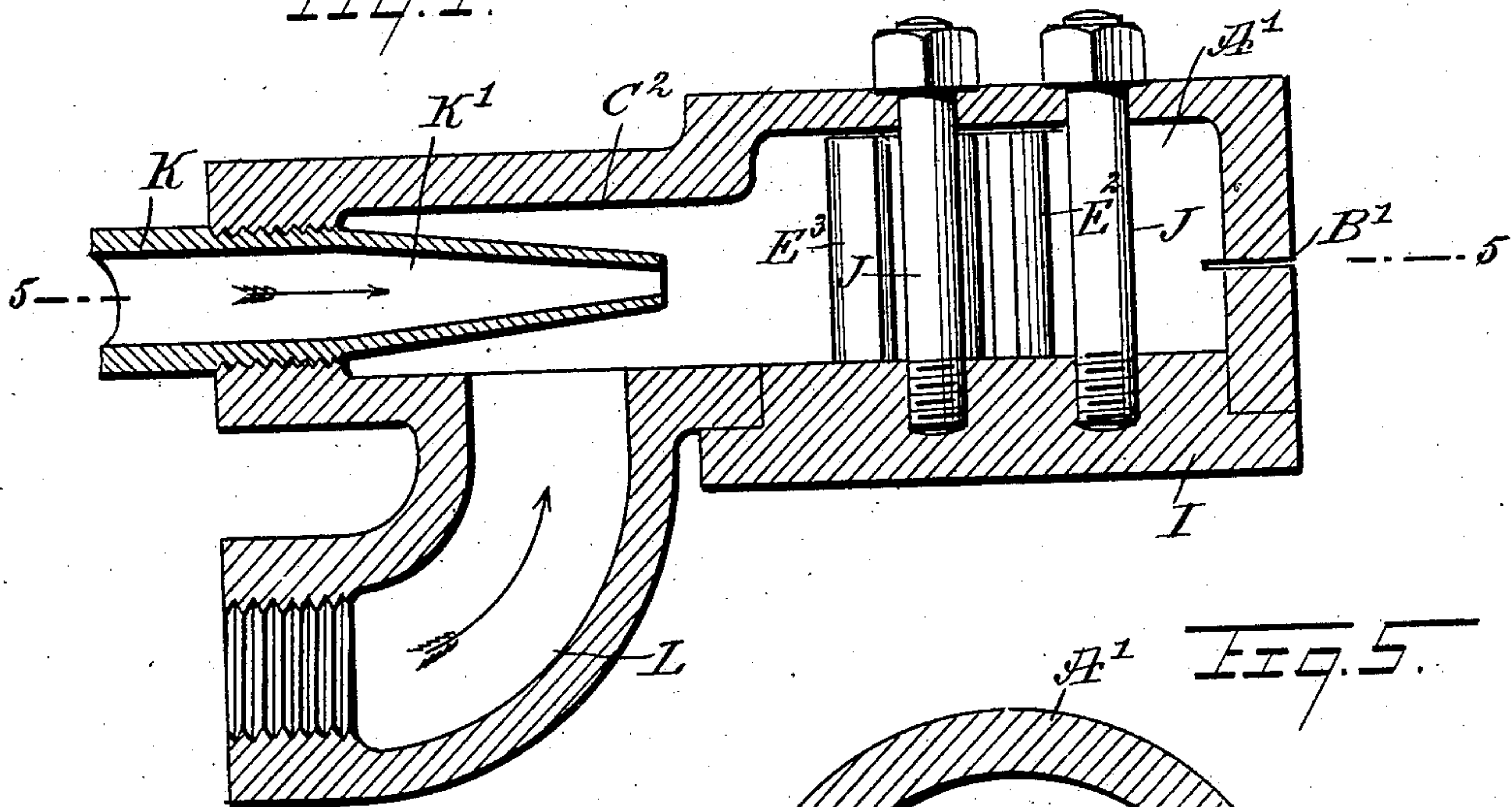
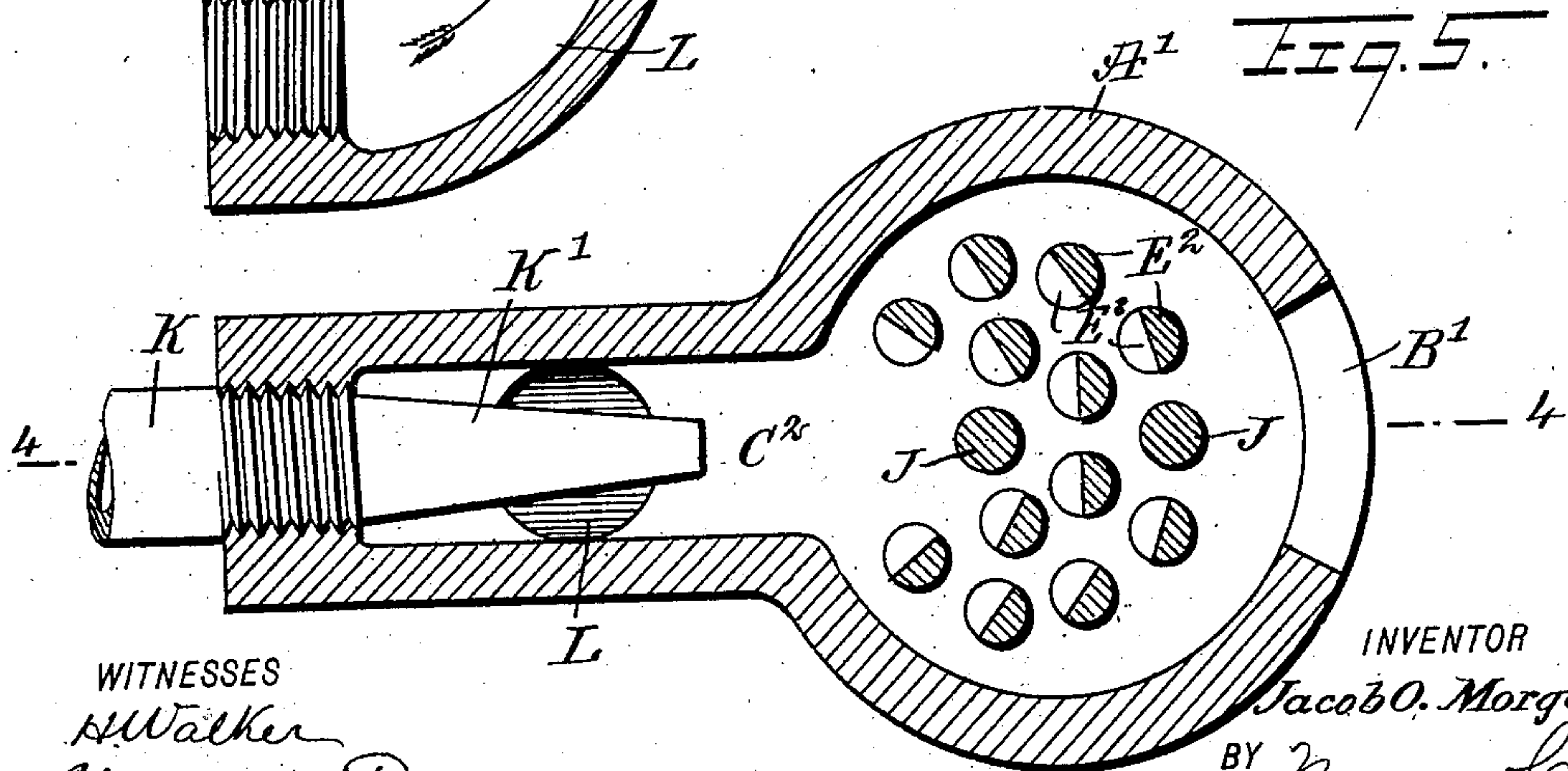


Fig. 5.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JACOB OSBORNE MORGAN, OF OAKLAND, CALIFORNIA.

## BURNER.

No. 884,286.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed July 18, 1907. Serial No. 384,353.

*To all whom it may concern:*

Be it known that I, JACOB OSBORNE MORGAN, a citizen of the United States, and a resident of Oakland, in the county of Alameda and State of California, have invented a new and Improved Burner, of which the following is a full, clear, and exact description.

The invention relates to hydrocarbon burners, and its object is to provide a new and improved burner for burning fuel oil, and especially designed for use in boiler furnaces and other places, and arranged to insure complete combustion of the fuel without forming undesirable residue, and to permit using a low grade oil.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement as arranged for use in boiler furnaces; Fig. 2 is an enlarged sectional side elevation of the improvement on the lines 2—2 of Figs. 1 and 3; Fig. 3 is a sectional plan view of the same on the line 3—3 of Fig. 2; Fig. 4 is a sectional side elevation of a modified form of the improvement, the section being on the line 4—4 of Fig. 5, and Fig. 5 is a sectional plan view of the same on the line 5—5 of Fig. 4.

The atomizing chamber A of the burner is preferably made cylindrical in form and provided in its peripheral face with an exit slot B through which passes the combustible mixture to be burned, as indicated in Fig. 1. Into the atomizing chamber A opens a nozzle C' directly opposite the slot B, and the said nozzle C' forms part of a steam chamber C connected with one end of a steam pipe D bent to pass around the atomizing chamber A in alinement with the slot B, so that the burning mixture strikes the steam pipe D and super-heats the steam passing through the said pipe D previous to the steam entering the chamber C and the atomizing chamber A. The steam pipe D is connected with a boiler or other suitable source of steam supply.

In the atomizing chamber A extend a plurality of spaced pins E having flattened por-

tions E' facing the nozzle C' and also facing the perforations in perforated pipes F, connected with the interior of an oil supply chamber G connected by a pipe H with an oil supply. As illustrated in the drawings the oil chamber G is provided with a threaded offset G' which screws into the bottom of the atomizing chamber A, and the pins E as well as the pipes F are preferably attached to the oil chamber G at the said threaded offset G'. Thus by unscrewing the oil chamber G from the atomizing chamber A, convenient access is had to the several parts of the burner for cleaning, repairing or other purposes. Now when the burner is in use, the super-heated steam passes from the steam pipe D into the chamber C, and from the latter by way of the nozzle C' into the atomizing chamber A, and the oil passes from the oil chamber G either by pressure or gravity feed through the pipes F and the perforations thereof into the atomizing chamber A, to be taken up by the steam and forced by the latter against the flattened portions E' of the pins E, to thoroughly atomize the oil, and to insure a perfect commingling of the atomized oil and the steam. The resultant combustible mixture passes through the slot B to be then burned in the furnace or other device on which the burner is used.

As illustrated in Figs. 4 and 5, the oil chamber G is dispensed with and the atomizing chamber A' is provided with a slot B', and is closed at the bottom by a cap I held in place on the atomizing chamber by bolts J extending through the said chamber. The cap I carries the atomizing pins E<sup>2</sup> having flattened portions E<sup>3</sup> facing the entrance C<sup>2</sup> located directly opposite the slot B'. Into the entrance C<sup>2</sup> extends the nozzle K' of a steam pipe K, and into the said entrance C<sup>2</sup> also opens the oil supply pipe L connected with a suitable source of oil supply. Now by the arrangement described the steam passing through the nozzle K' draws oil through the pipe L into the entrance C<sup>2</sup>, to be mixed with steam and forced by the latter against the flattened surfaces E<sup>3</sup> of the pins E<sup>2</sup>, to insure a complete atomizing of the oil and commingling of the oil and the steam. The resultant combustible mixture then passes from the atomizing chamber A' by way of the slot B' into the fire box of the furnace, to be burned therein.

The burner shown and described is very



simple and durable in construction and composed of comparatively few parts, not liable easily to get out of order.

As the oil is divided in passing through the perforations of the pipes F and is then forced by the steam against the flattened portions E' of the pins E, it is evident that the oil is thoroughly atomized and burns in the fire box with a pure white flame, thus insuring complete combustion of the fuel.

By the arrangement illustrated in Figs. 4 and 5, the oil can be drawn by the action of the steam passing through the nozzle K' from a suitable reservoir without requiring pressure on the oil.

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

1. A burner comprising an atomizing chamber having a removable bottom, spaced pins carried by said bottom and extending vertically in the said atomizing chamber when the bottom is in position, and means for forcing oil and steam into the said chamber against the said pins, to spray the oil and cause an intimate commingling of the oil and steam.

2. A burner comprising an atomizing chamber, a removable closure for said chamber, a series of spaced pins carried by said closure and extending across the said atomizing chamber when the closure is in position, the said pins having flattened portions facing the entrance of the said atomizing chamber, and means for passing oil and steam separately into the said atomizing chamber and directing the same against the flattened sides of the pins.

3. A burner comprising an atomizing chamber, an exit slot opposite the entrance of the atomizing chamber, a removable closure for the atomizing chamber, the closure being provided with spaced pins projecting from its inner face and extending across the atomizing chamber when the closure is in position, the said pins having flattened portions facing the entrance of the said atomizing chamber, the said pins having a staggered arrangement relative to the entrance and the exit slot of said chamber, and means for passing oil and steam separately into the said atomizing chamber and directing the same against the flattened sides of the pins.

4. A burner comprising an atomizing chamber having an exit slot opposite the entrance of the chamber, spaced pins extending in the said chamber and having flattened portions facing the entrance of the said atomizing chamber, a steam nozzle discharging into said entrance, an oil chamber connected with an oil supply, and a perforated pipe connected with the said oil chamber and extending into the said atomizing chamber at a point between the said pins and the said steam nozzle, the perforations of

the said pipe, being opposite the flattened portions of said pins.

5. A burner comprising an atomizing chamber having an exit slot opposite the entrance of the chamber, spaced pins extending in the said chamber and having flattened portions facing the entrance of the said atomizing chamber, a steam nozzle discharging into the said entrance, an oil chamber connected with an oil supply, and a perforated pipe connected with the said oil chamber and extending into the said atomizing chamber at a point between the said pins and the said steam nozzle, the perforations in the said pipe being opposite the said flattened portions of the pins.

6. A burner comprising an atomizing chamber having an exit slot opposite the entrance to the chamber, a removable closure for the said chamber having a series of spaced pins projecting from its inner face and extending across the atomizing chamber, an oil supply for the said chamber, and a steam pipe extending around the atomizing chamber in alinement with the said exit slot, the said pipe terminating in a nozzle discharging into the entrance of the atomizing chamber opposite the said exit slot.

7. A burner comprising an atomizing chamber having an exit slot, a steam nozzle opening into the said atomizing chamber opposite the said exit slot, a removable closure for the said atomizing chamber, spaced pins carried by the said closure and extending across the atomizing chamber between the exit slot and the said nozzle and at right angles to the direction of the same, the said pins having flattened portions facing the said nozzle, and means for conducting oil into the said atomizing chamber at a point between the said pins and the said nozzle.

8. A burner comprising an atomizing chamber having an exit slot, a steam nozzle opening into the said atomizing chamber opposite the said exit slot, spaced pins within the said atomizing chamber and having flattened portions facing the said nozzle, perforated pipes extending into the said atomizing chamber opposite the said flattened portions of the pins and between the latter and the said nozzle, and an oil supply chamber connected with the said pipes and attached to the said atomizing chamber.

9. A burner comprising an atomizing chamber having an exit slot, a steam nozzle opening into the said atomizing chamber opposite the said exit slot, spaced pins within the said atomizing chamber and having flattened portions facing the said nozzle, perforated pipes extending into the said atomizing chamber opposite the said flattened portions of the pins and between the latter and the said nozzle, and an oil supply chamber connected with the said pipes and attached to the said atomizing chamber, the



said pins and perforated pipes being attached to the said oil supply chamber.

10. A burner comprising an atomizing chamber approximately cylindrical in shape and provided in its peripheral face with an exit slot, a steam nozzle opening into the said atomizing chamber opposite the said exit slot, an oil supply chamber having a threaded offset screwing into the bottom of the atomizing chamber and forming a removable closure for said atomizing chamber, spaced pins secured to the offset portion of the oil chamber and extending vertically within the atomizing chamber, and perforated pipes

secured to the offset portion of the oil chamber and extending at their upper portions into said atomizing chamber and located between the said pins and the said nozzle, the said pipes communicating with the oil chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB OSBORNE MORGAN.

Witnesses:

A. L. LOMBA,  
W. W. MORELAND.