

No. 756,796.

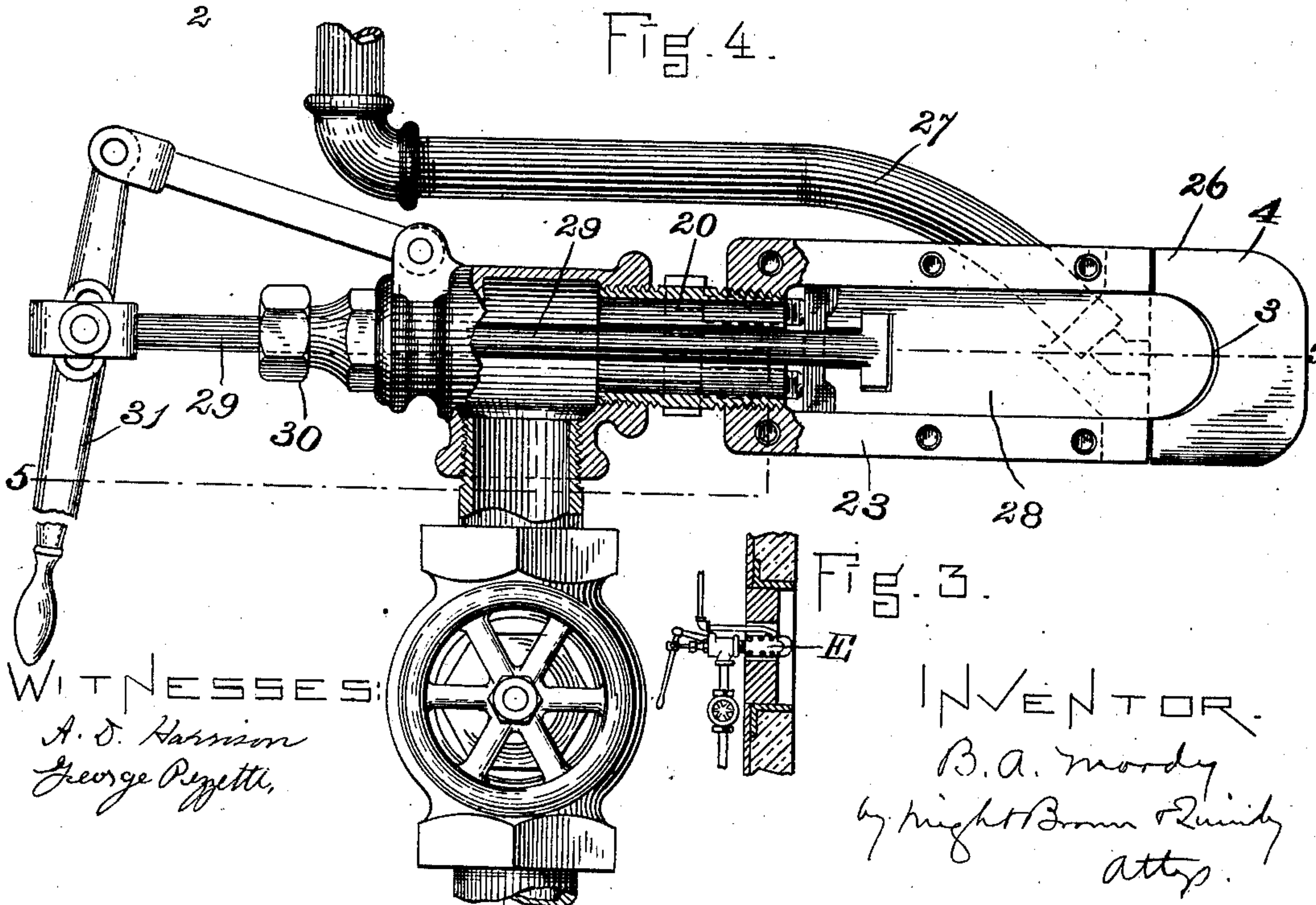
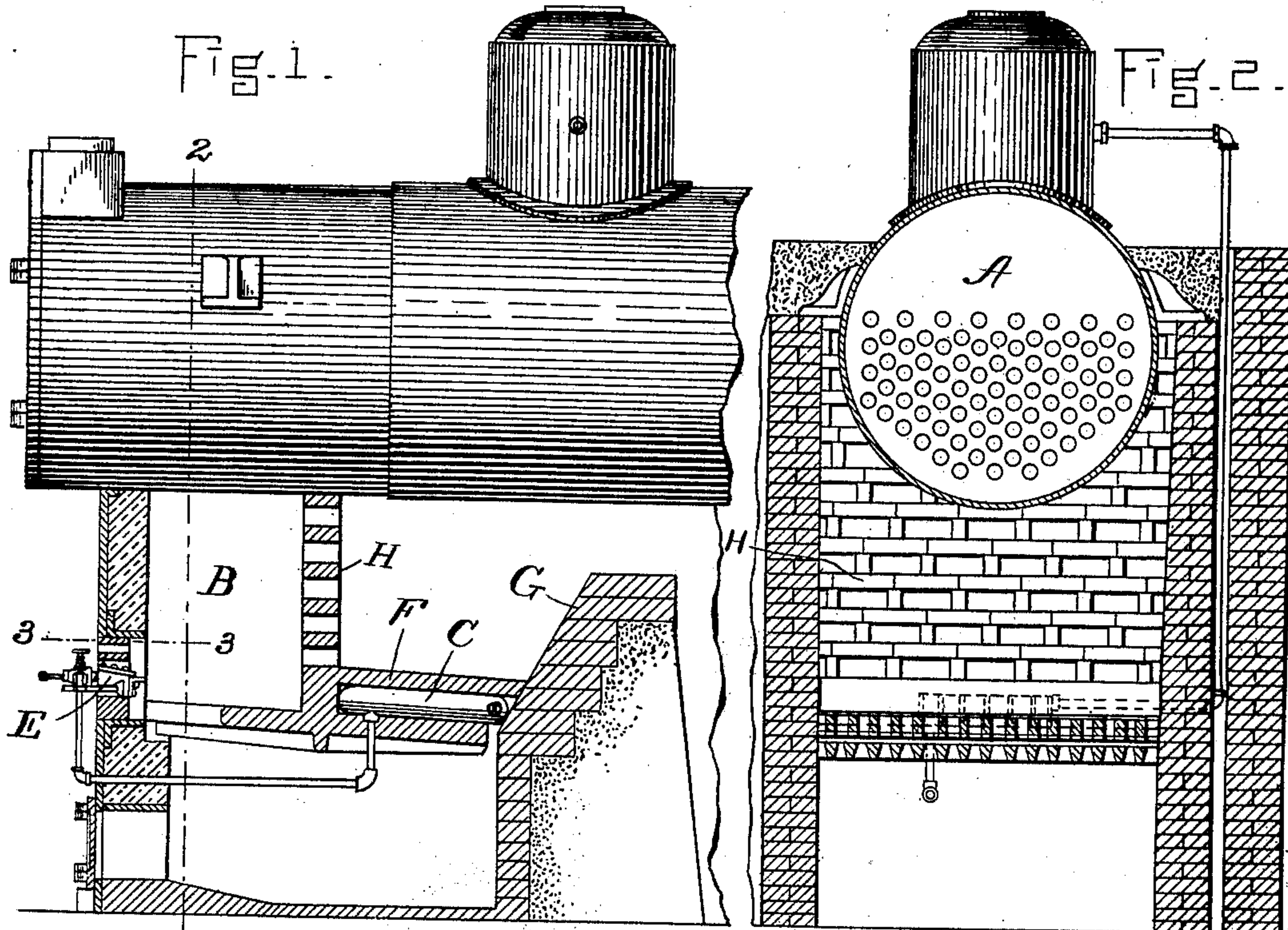
PATENTED APR. 5, 1904.

B. A. MOODY.
HYDROCARBON BURNER.

APPLICATION FILED MAR. 23, 1901. RENEWED OCT. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:
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2 SHEETS—SHEET 2.

Fig. 5.

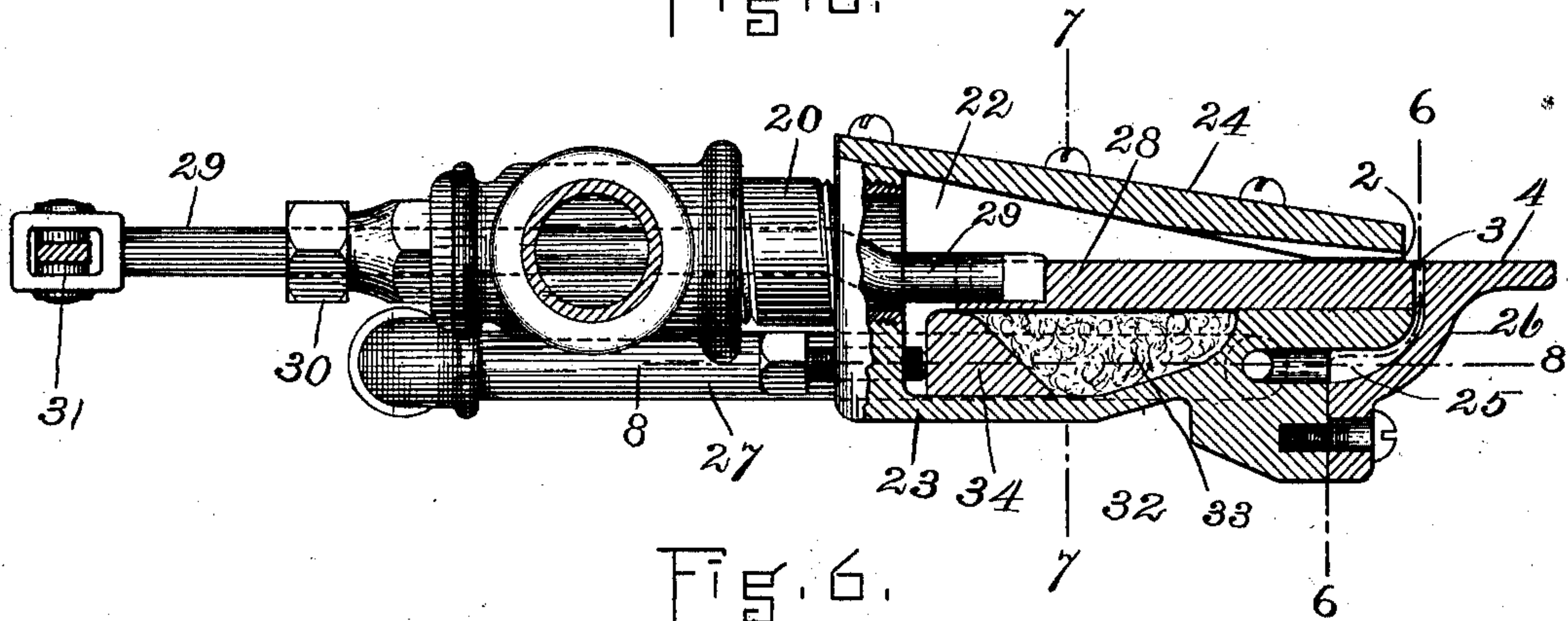


Fig. 6.

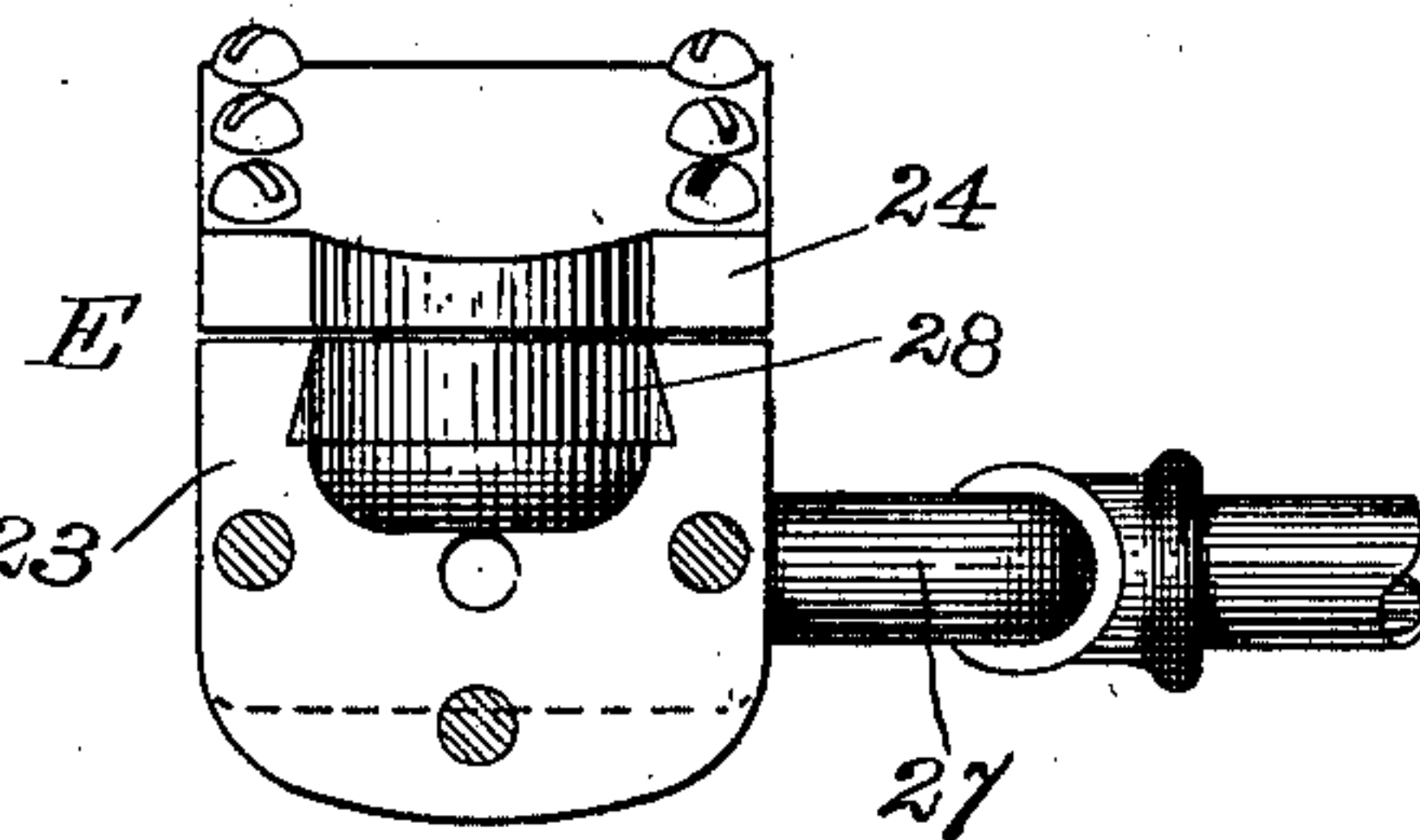


Fig. 7.

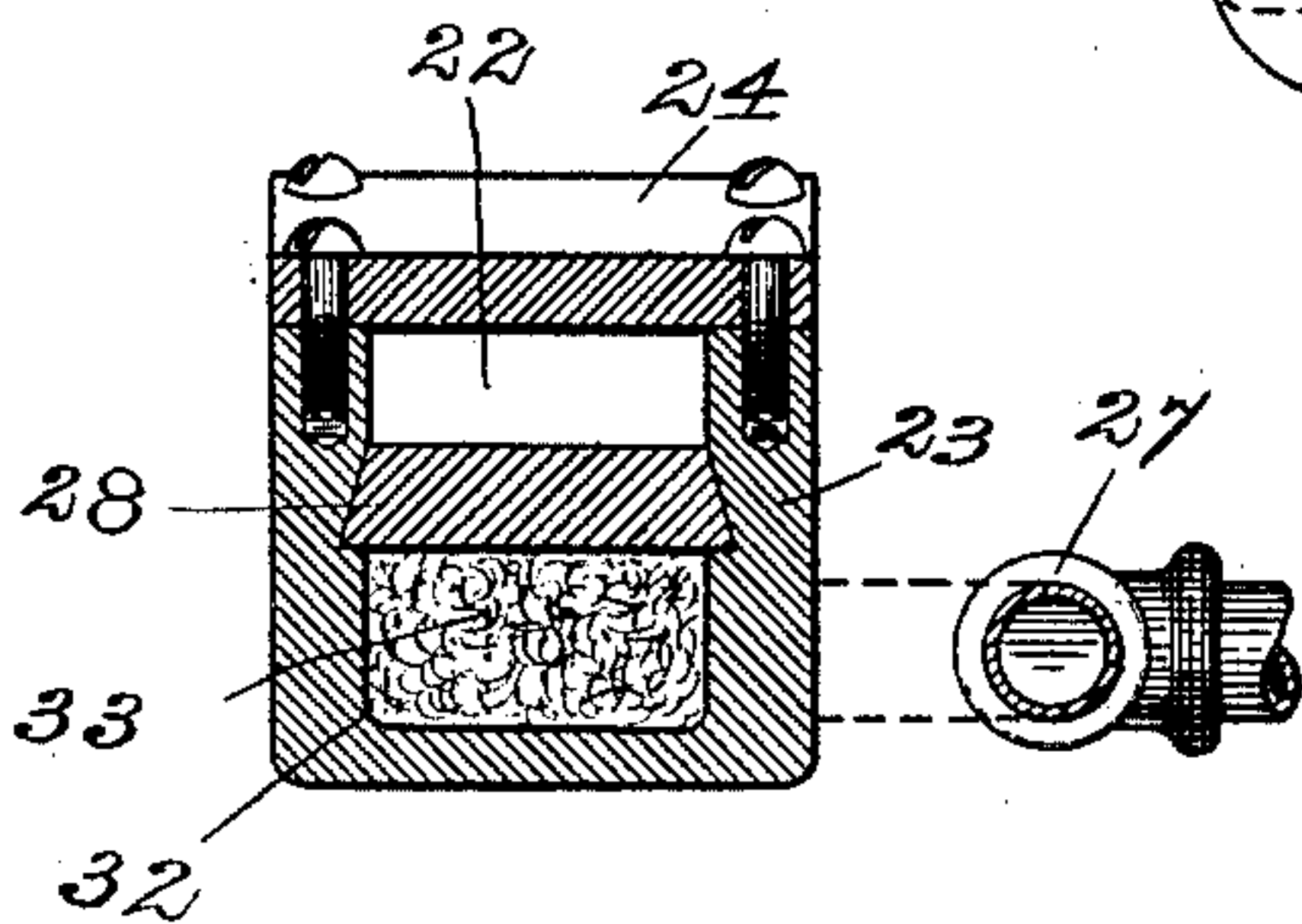


Fig. 8.

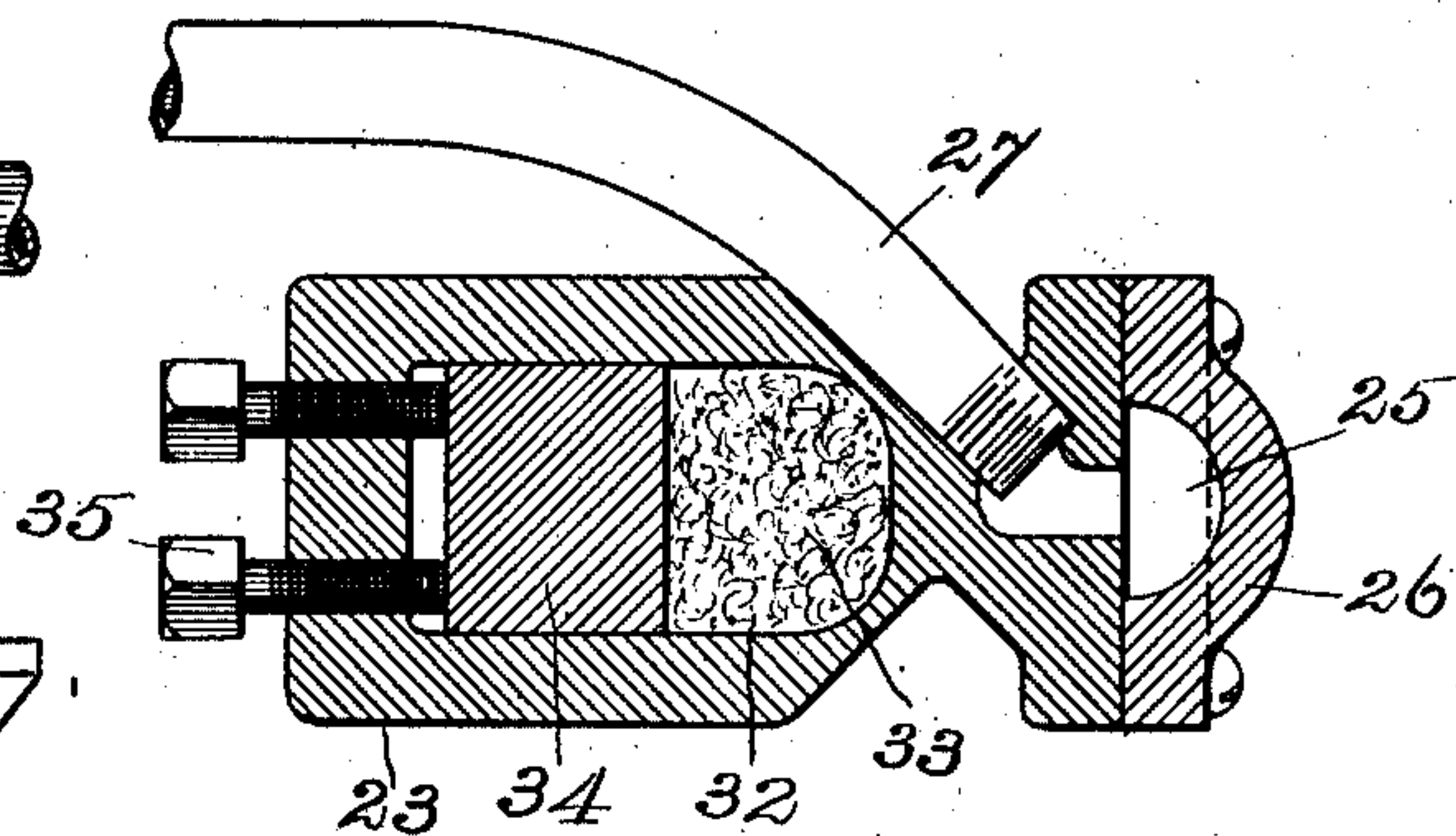
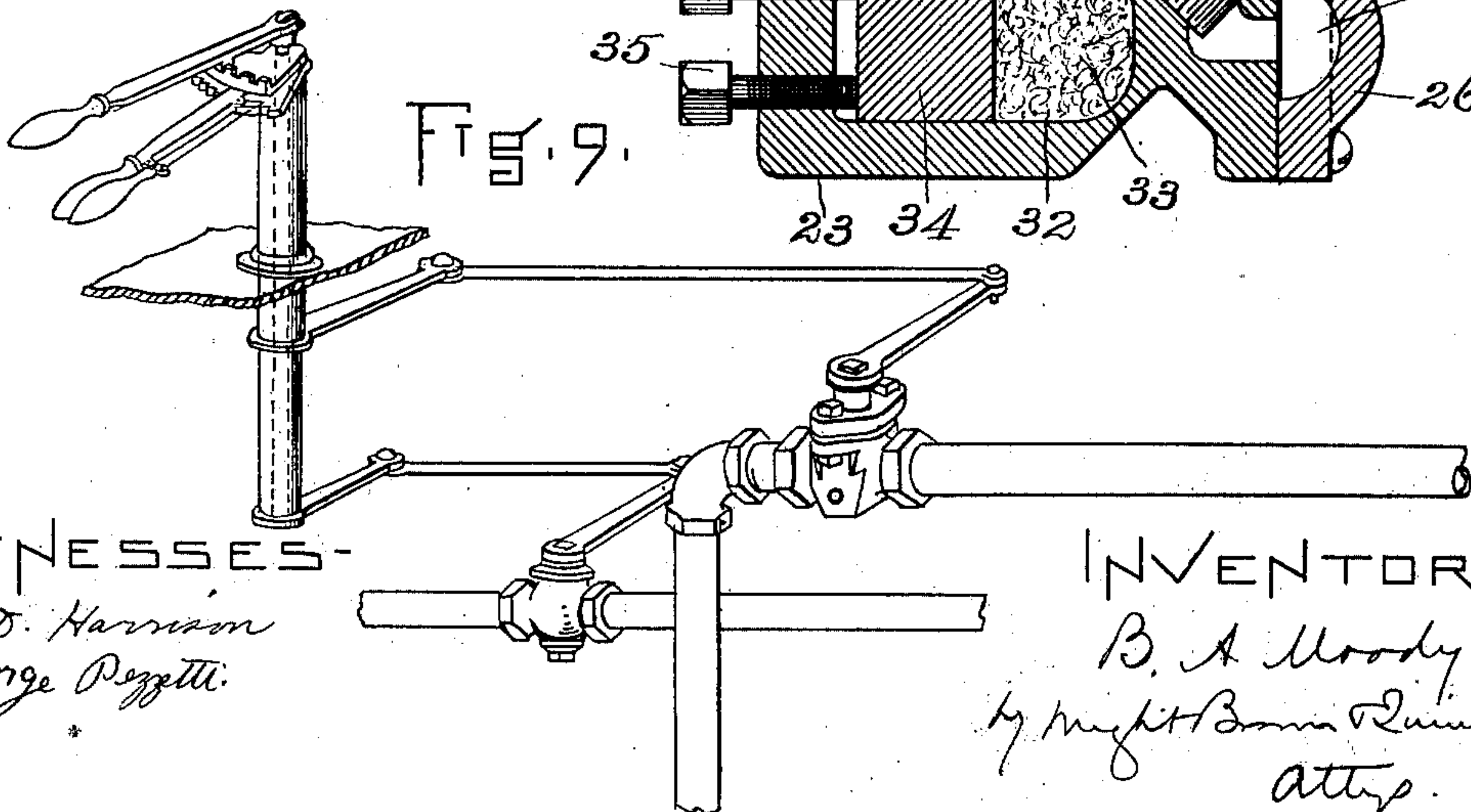


Fig. 9.



WITNESSES-

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UNITED STATES PATENT OFFICE.

BENJAMIN A. MOODY, OF WEST ROXBURY, MASSACHUSETTS, ASSIGNOR
TO THE B. A. MOODY HYDRO-CARBON BURNER COMPANY, OF PORT-
LAND, MAINE, A CORPORATION.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 756,796, dated April 5, 1904.

Application filed March 23, 1901. Renewed October 7, 1903. Serial No. 176,154. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN A. MOODY, of West Roxbury, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

This invention is an improvement upon that set forth in Letters Patent of the United States No. 387,799, dated August 14, 1888, and relates to furnaces using liquid hydrocarbon as fuel. The invention set forth in said patent had for its object the insuring of a perfect combustion of the fuel and the provision of efficient means for regulating the flow of the hydrocarbon, so that the heat might be controlled. The burner shown in said patent comprises a casing having oil and steam chambers with their discharging-passages converging into one elongated orifice and a sliding valve seated partly in said orifice and forming two independent contracted outlets at an angle to each other, one of which orifices is controlled by the valve, the outer end of which forms one wall of the oil-orifices. The valve forms the bottom portion of the steam-chamber, and the steam in said chamber impinges upon the valve and is liable to find its way under the same, and thus leak into the oil-chamber, causing back pressure therein and preventing the oil which flows by gravity to the point of combustion from reaching said point.

The present invention has for its object to provide simple and efficient means for preventing the leakage of steam below the valve and into the oil-chamber, thus obviating the objection above noted and greatly contributing to the effectiveness of the burner.

The invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a sectional elevation of a boiler-furnace to which my improved burner is applied. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 1 and is a plan view of the burner below said line. Fig. 4 represents an en-

larged plan view, partly in section, of the burner shown in Fig. 3. Fig. 5 represents a section on line 5 5 of Fig. 4. Fig. 6 represents a section on line 6 6 of Fig. 5. Fig. 7 represents a section on line 7 7 of Fig. 5. Fig. 8 represents a section on line 8 8 of Fig. 5. Fig. 9 is a perspective view illustrating the means for regulating the valves of the steam and oil supply pipes.

On the drawings, A represents a portion of a boiler, and B represents the fire-box under the same.

C represents a superheater of any ordinary construction adapted to superheat the steam required by the hydrocarbon-burner herein-after described, said superheater being arranged as shown and described in the above-mentioned patent, except that it is inclosed in a casing F, preferably fire-brick, arranged in front of the bridge-wall G.

H represents a fire-brick wall extending from the casing F to the boiler and composed of bricks arranged to form spaces, as shown in Figs. 1 and 2. Said wall is arranged so that the flame from the burner impinges against it or its lowest portion, the bricks composing the wall being highly heated, so that their surfaces facilitate the consumption of the products of combustion, and thus increase the effectiveness of the burner.

E represents the burner, which is contained in an opening in the front wall of the fire-box and is of the same general construction as illustrated in the above-mentioned patent—that is to say, as here shown, particularly in Figs. 4 and 5, the burner consists of an irregular casting 23, having a chamber 22, closed by a plate 24, that communicates with the steam-supply pipe 20. This steam-chamber of the burner gradually tapers down to its mouth 2, the width of the chamber remaining unchanged, so that the steam will issue therefrom in a fine jet, but of considerable width. The casting 23 also provides a second chamber 25 of smaller dimensions closed by a cap 26, that is connected by a pipe 27 with the liquid-hydrocarbon reservoir or tank, (not shown,) which should be supported sufficiently

high to allow the liquid hydrocarbon to flow to the top of the burner. This oil-chamber 25 is also contracted toward its mouth 3, that is arranged just beyond the mouth 2 of the steam-chamber and preferably the slightest degree lower than said last-named mouth. The extent of opening of the mouth 3 of the oil-chamber is regulated by a valve 28, that is movable in guides in the sides of the steam-chamber 22, the stem 29 whereof extends through a portion of the steam-supply pipe and a stuffing-box 30 and is operated by a lever or other handle 31. The end of the upper face of this valve 28 provides one side of the mouth 2, and its end also provides one side of the mouth 3. The oil-chamber mouth 3 may be raised or lowered with respect to the mouth 2 to vary the effect of the jet of steam passing over said mouth 3 by adjusting the position of the cap 26 through its attaching-screws, so that its flat horizontal face 4, which is at substantially right angles to the oil-orifice and situated below and in line with the steam-orifice, is approached toward or from the said jet of steam. The quantity of oil rising to the level of the face 4 will be regulated to a nicety by adjusting laterally the position of the valve 28, so as to vary the size of the mouth 3.

The casting 23 is made hollow below the rear portion of the valve 28 to form a chamber 32, adapted to receive a mass of packing material 33. The bottom of the rear portion of the packing-chamber is substantially parallel with the under side of the valve 28, and in this portion is a follower 34, which extends entirely across the chamber 33 and is in height equal to the space between the rear portion of the bottom of the chamber and the valve 28, so that when the follower is forced forward it confines and compresses the packing in the forward part of the chamber 33. The follower is backed by screws 35, which enable it to be moved forward to compress the packing. The front end of the follower and the forward portion of the bottom of the chamber 32 are preferably inclined, the inclines being arranged as shown in Fig. 5, so that when the follower is moved forward the inclines will force the packing upwardly and hold it closely against the bottom of the valve, thus preventing leakage of steam under the valve and its entrance into the oil-chamber 25. This provision for the exclusion of steam from the oil-chamber is one of great importance. In my former patent above mentioned I have shown a narrow recess in the casting 23 under the valve for the reception of packing material and a screw arranged to bear on one end of the mass of packing and compress it by a movement crosswise of the movement of the valve, so that when the packing was compressed it was shortened crosswise of the valve and a gap was formed at one end of the packing through which steam found its way

to the oil-chamber. Moreover, no means were provided for pressing the packing upwardly against the valve.

The described improvement comprising the packing-chamber and the follower movable in the direction of movement of the valve, so that as the packing is compressed it is crowded outwardly against the sides of the casing, is an important improvement over my prior construction. The inclines on the follower and the bottom of the packing-chamber which cause an upward pressure of the packing against the valve are also important, it being very essential that the leakage of steam under the valve be prevented, for if such leakage occurs the pressure of the steam in the oil-chamber 25 is liable to force the oil backwardly from the mouth 3, particularly when the oil-reservoir is located at a relatively low point, so that the pressure due to the height of the reservoir is relatively light. In practice, especially on locomotives, it is desirable to locate the oil-reservoir about three feet above the mouth 3, and the pressure of oil caused by this elevation would be insufficient to overcome the pressure of steam leaking into the chamber 25 under the valve.

The operation is as follows: Steam admitted to the chamber 22 issues in the form of a jet from the burner-mouth 2 and is prevented by the packing 33 from gaining access to the chamber 25 below the mouth 3. The oil is therefore permitted to rise to the upper end of the mouth 3 and to flow upon the face 4 in the form of a thin film. The jet of steam striking the face 4 will take up oil spread thereon and carry it in the form of spray against the heated refractory material of the wall H. The flame of the burning hydrocarbon speedily brings the refractory material to a red heat and then to incandescence, the heat therefrom soon generating steam in the boiler A.

In Fig. 9 I show means, such as are shown and described in the patent above mentioned, for controlling the valves in the steam and oil supply pipes by an attendant located, for example, in the cab of a locomotive.

I claim—

1. A hydrocarbon-burner consisting of a casing having steam and oil chambers with their discharge-passages converging into a single orifice, a sliding valve situated partly in said orifice and cooperating with the walls of said orifice to form two independent contracted outlets one for steam and the other for oil, a packing-chamber under said valve, and means extending entirely across the chamber and across the path of movement of the valve for applying pressure to a mass of packing in the chamber to press the same simultaneously against both sides of the chamber.

2. A hydrocarbon-burner consisting of a casing having steam and oil chambers with their discharge-passages converging into a

single orifice, a sliding valve situated partly in said orifice and cooperating with the walls of said orifice to form two independent contracted outlets one for steam and the other for oil, a packing-chamber under said valve, and means for applying pressure to a mass of packing in the chamber to press the same upwardly against the valve across the entire width thereof.

3. A hydrocarbon-burner consisting of a casing having steam and oil chambers with their discharge-passages converging into a single orifice, a sliding valve situated partly in said orifice and cooperating with the walls of said orifice to form two independent contracted outlets one for steam and the other for oil, a packing-chamber under said valve, and means for applying pressure to a mass of packing in the chamber to press the same simultaneously against the sides of the chamber and the entire width of the under side of the valve.

4. A hydrocarbon-burner consisting of a casing having steam and oil chambers with their discharge-passages converging into a single orifice, a sliding valve situated partly in said orifice and cooperating with the walls of said orifice to form two independent contracted outlets one for steam and the other for oil, a packing-chamber under said valve, and a packing compressor or follower movable in the direction of movement of the valve toward and from the oil-outlet whereby the packing may be compressed and expanded crosswise of the casing.

5. A hydrocarbon-burner consisting of a casing having steam and oil chambers with their discharge-passages converging into a single orifice, a sliding valve situated partly in said orifice and cooperating with the walls of said orifice to form two independent contracted outlets one for steam and the other for oil, a packing-chamber under said valve, and a packing compressor or follower movable in the direction of movement of the valve toward and from the oil-outlet whereby the packing may be compressed and expanded crosswise of the casing, said follower having an inclined end arranged to press the packing against the valve.

6. A hydrocarbon-burner consisting of a casing having steam and oil chambers with their discharge-passages converging into a single orifice, a sliding valve situated partly in said orifice and cooperating with the walls of said orifice to form two independent contracted outlets one for steam and the other for oil, a packing-chamber under said valve having the forward portion of its lower surface inclined, and a packing compressor or follower movable in the direction of movement of the valve, and adapted to expand the packing crosswise of the casing.

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

BENJAMIN A. MOODY.

Witnesses:

C. F. BROWN,
A. D. HARRISON.