

W. R. SMITH.
OIL BURNER.

APPLICATION FILED SEPT. 8, 1903.

NO MODEL.

Fig. 1.

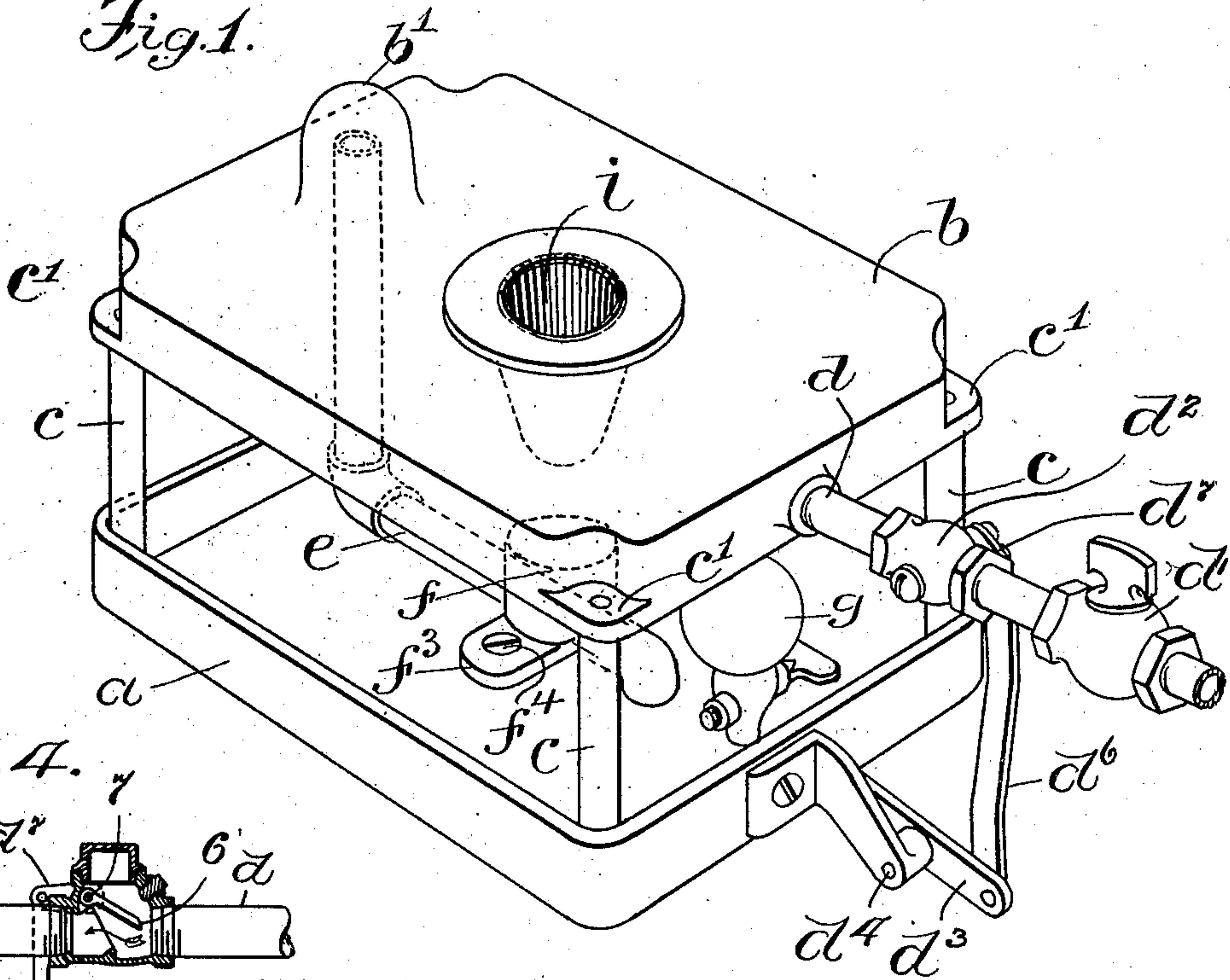


Fig. 4.

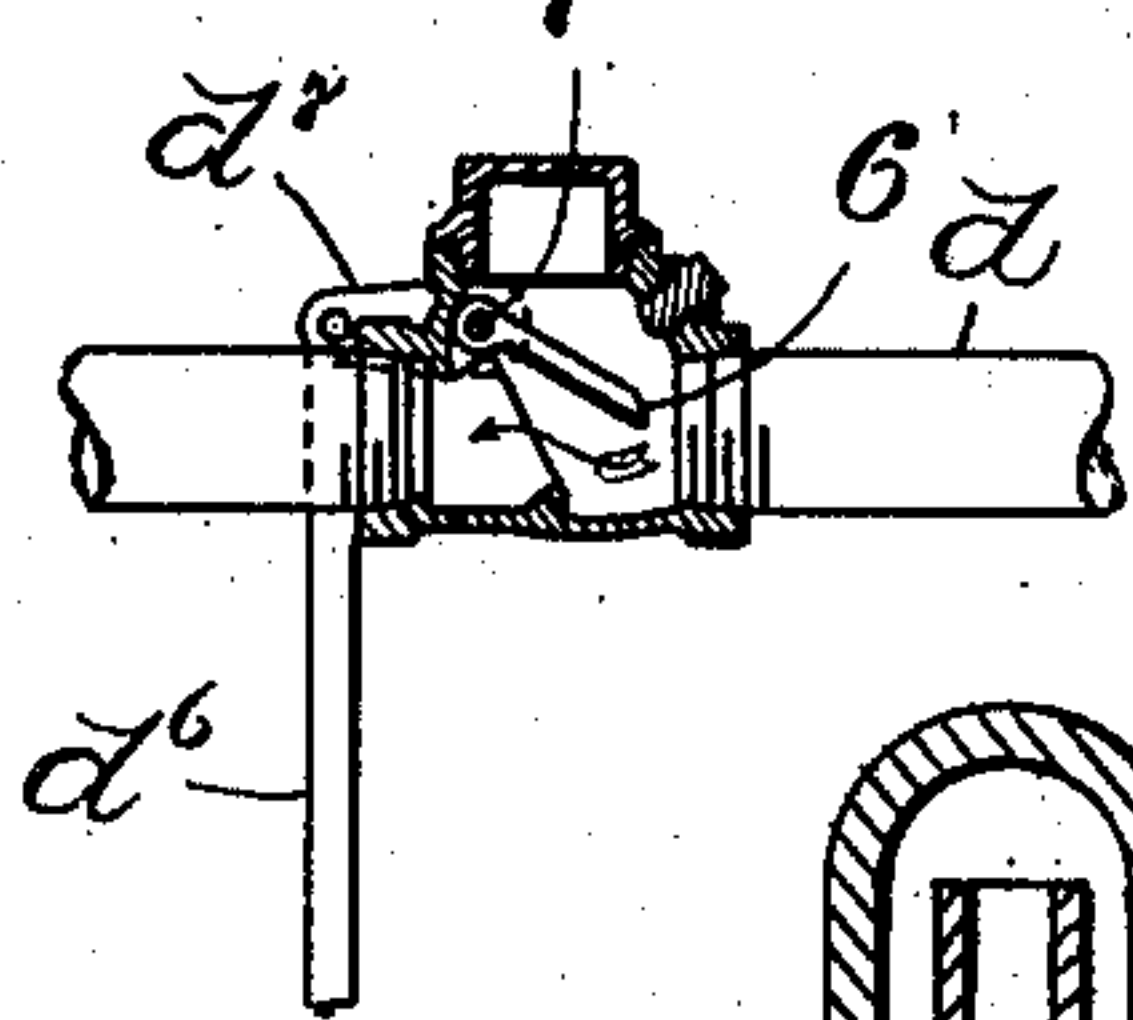


Fig. 2.

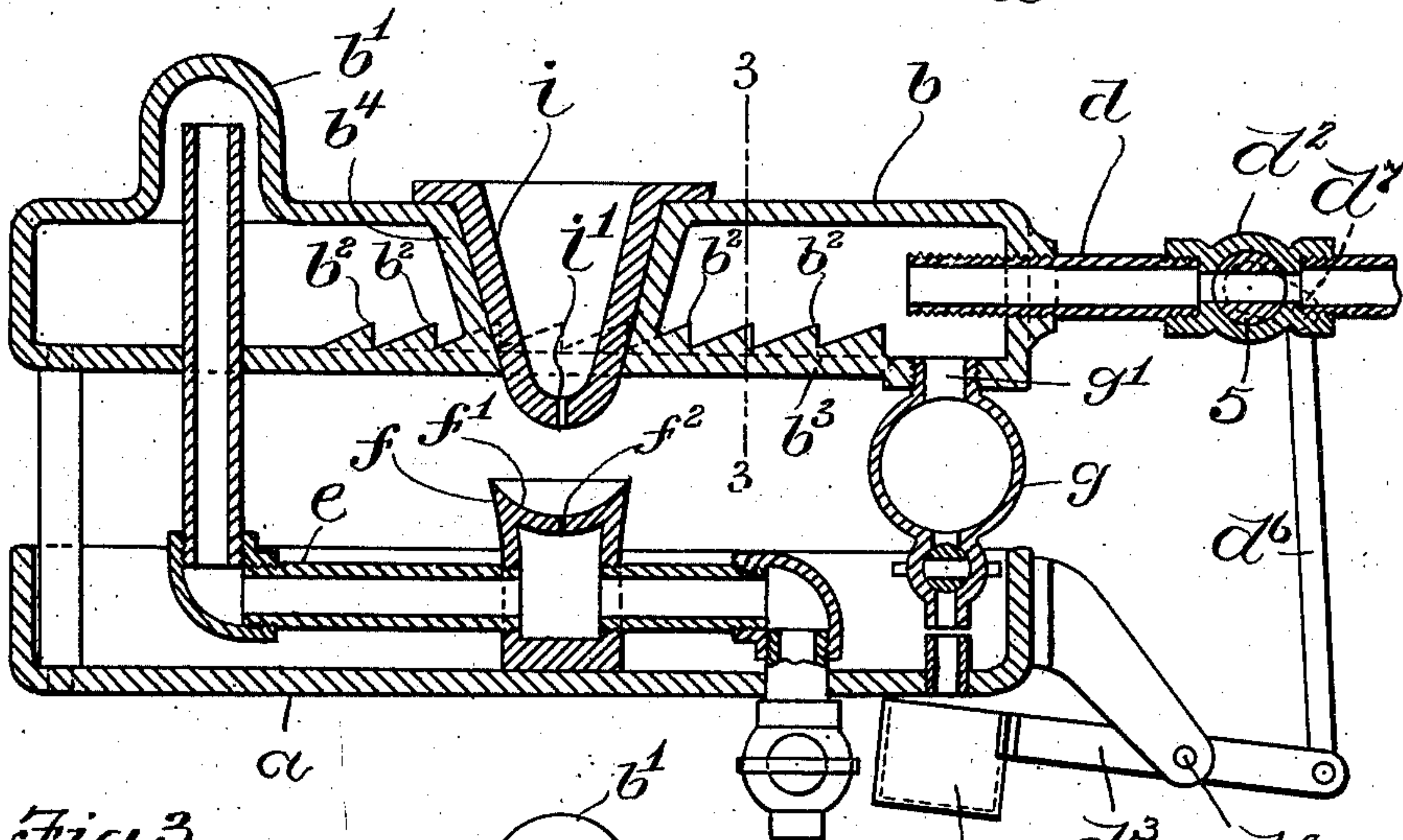
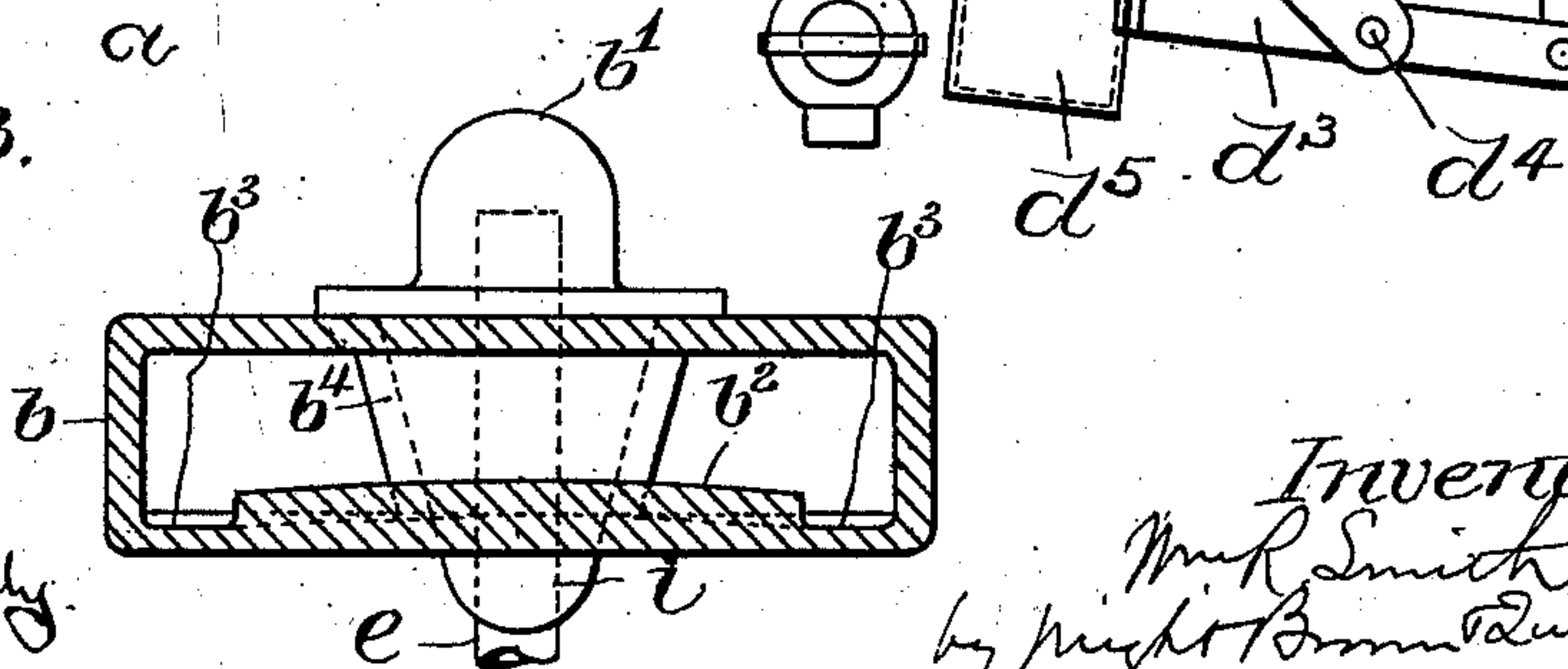


Fig. 3.



Witnesses.

Laurence Kennedy
P. W. PezzettoInventor:
W. R. Smith.
by Night & Son
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM R. SMITH, OF BUFFALO, NEW YORK.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 746,596, dated December 8, 1903.

Application filed September 8, 1903. Serial No. 172,360. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. SMITH, of Buffalo, in the county of Erie and State of New York, have invented certain new and
5 useful Improvements in Oil-Burners, of which the following is a specification.

This invention has for its object to provide a simple, durable, and effective apparatus for burning crude petroleum or other oil and
10 for converting the oil into a vapor or gas without the formation of a sediment or deposit of carbon, and therefore without liability of clogging and choking the apparatus.

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

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of an oil-burner embodying my invention. Fig. 2 represents a longitudinal vertical section of the same. Fig. 3
20 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a modification hereinafter referred to.

The same characters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a tray or trough which forms the supporting-base of my improved burner.

30 *b* represents a chamber or retort which is supported above the base *a*, preferably by means of standards *c*, formed on or affixed to the base and engaging ears *c'*, formed on the chamber *b*.

35 *d* represents an oil-supply pipe which enters one end of the retort *b*.

e represents a gas-outlet pipe which extends from the interior of the retort *b* to a burner *f*, affixed to the base *a*, said burner
40 being a chamber having a top *f'*, which is preferably concave and has a small gas-outlet *f''*. The end of the gas-pipe *e* which is contained within the retort is preferably extended upwardly into a dome *b'*, formed on
45 the upper portion of the retort.

When oil is admitted to the retort and the retort is externally heated, as by the combustion of oil placed in the tray or base *a*, vapor is generated in the retort and passes through
50 the dome *b'* and gas-pipe *e* to the burner *f*, where it is discharged upwardly and ignited

at the outlet *f''*. The flame impinges upon the under surface of the retort, keeping the latter heated, so that the vaporization of the oil within the retort goes on continuously. 55 The heat and products of combustion pass outwardly around the edges of the retort and circulate through the stove in which the described apparatus is placed.

One object of my invention is to prevent 60 the oil from accumulating to any considerable depth on the bottom of the retort *b*, my aim being to maintain only a film or thin coating of oil on the bottom of the retort without permitting the oil to accumulate, the 65 surplus oil being drained off continuously and allowed to accumulate in a receptacle *g* below the retort. To this end I provide the bottom of the retort with a series of ridges or barriers *b''*, which are preferably elongated to 70 extend across a considerable portion of the width of the interior of the retort and present shoulders or faces arranged to arrest portions of the oil entering the retort through the supply-pipe *d*. The ridges or barriers *b''* are preferably 75 cut away at their ends, as shown in Fig. 3, to form gutters *b'''*, arranged to conduct the surplus oil that flows from the ridges or barriers to the outlet *g'*, which communicates with the receptacle *g*, the bottom of 80 said gutters being preferably inclined, as indicated by dotted lines in Fig. 2. The barriers *b''* are preferably slightly higher at their central portions than at their ends, as indicated in Fig. 3, to facilitate the flow of the 85 surplus oil to the gutters.

The oil admitted through the supply-pipe *d* enters the retort in a stream extending crosswise of the barriers *b''* and is distributed along the heated surfaces of said barriers and 90 flows into the gutters *b'''*, the result being that there is no appreciable accumulation of oil, a thin film or coating of oil being maintained and this coating being continuously vaporized by the heated bottom of the retort. The 95 surplus oil finds its way into the receptacle *g*, is vaporized in said receptacle by the heat from the burner *f*, the wall of the receptacle *g* being preferably relatively thin, so that the heat is conducted quickly through it. The 100 vapor formed in the receptacle *g* returns through the passage *g'* to the retort. I have

found in practice that by thus providing for the escape of surplus oil which is not immediately vaporized in the retort I prevent all liability of the formation of coke or carbon in the retort. I also find that by forming the bottom of the retort in such manner that the surplus oil does not accumulate, but flows away from the point where it originally fell, after the apparatus is in full blast the surplus oil is practically all vaporized, so that but little is to be found at any time in the receptacle *g*. Moreover, the little that accumulates in the receptacle *g* is, as above stated, vaporized in said receptacle, which serves as a supplemental retort.

The supply-pipe *d* is preferably arranged to scatter the oil over the bottom of the retort and cause it to impinge upon the various ridges or barriers.

i represents a substantially conical deflector which is inserted loosely in a socket *b*⁴, extending through the retort from top to bottom. The deflector projects below the bottom of the retort and is located above the burner *f*, so that it acts to spread the flame of the burner. The deflector *i* may be removed from the retort to permit access to the burner *f* for the purpose of cleaning out the orifice *f*². I prefer to provide the lower end of the deflector *i* with an orifice *i*¹, which is in line with the burner-orifice *f*², so that a needle may be thrust through the orifice *i*¹ to clean the burner-orifice *f*² without removing the deflector *i*. The socket-wall *b*⁴ is arranged in the path of the stream of oil introduced through the supply-pipe *d* and aids in the distribution of the oil within the retort.

While I have shown one burner *f*, it is obvious that as many burners may be employed in one apparatus as circumstances may require. The burner *f* is provided with an ear *f*³, which is secured by screw *f*⁴ to the bottom of the base *a*. The said screw and ear enable the retort to be quickly attached to and released from the base. The gas-pipe *e* is rigidly affixed to the retort and to the burner. The retort rests upon the support *c* without being positively attached thereto. It will be seen, therefore, that when the screw *f*⁴ is driven home the retort and base are positively connected and when said screw is removed the said parts may be separated.

It will be observed that the dome *b*¹ projects above the top of the retort *b* and that the upper end of the gas-pipe *e* is within the dome, and therefore above the top of the retort. This arrangement prevents any liability of the entrance of drops of oil or any fragments of foreign matter into the gas-pipe and burner.

The oil-supply pipe *d* may be provided with a cock *d*¹, adapted to be opened and closed by hand. To guard against loss of oil and other difficulties which may result from failure to fully close the cock *d*¹ when the use of the burner is to be discontinued, a safety device may be employed. This may consist of a

cock *d*² in the pipe *d*, said cock having a plug 5, a lever *d*³, pivoted at *d*⁴ to an ear on the base *a*, an overflow-receptacle *d*⁵, connected with one end of the lever *d*³, and a rod *d*⁶, connecting the other end of the lever *d*³ with an arm *d*⁷, affixed to the plug 5. The receptacle *d*⁵ is arranged to catch any oil which may overflow from the apparatus. When the cock *d*² is open and the receptacle *d*⁵ is empty, the lever is held with the receptacle *d*⁵ raised in close proximity to the base *a*. When the receptacle is charged with oil overflowing from the apparatus, its weight causes the lever to tilt in the direction required to close the cock *f*², thus preventing further escape of oil. In the form of apparatus here shown oil flowing through the supply-pipe when the apparatus is not in use will first fill the retort and then overflow through the pipe *e* and the burner-orifices *d*² into the base *a*. The latter may have an outlet *a*¹ arranged to discharge the overflowing oil into the receptacle *d*⁵. I do not limit myself to this form of safety device and may variously modify the same without departing from the spirit of my invention.

In Fig. 4 I show a check-valve the swinging or valve member 6 of which is hinged at 7. An arm *d*⁷ is affixed to the valve 6 and is connected with the rod *d*⁶, the latter being connected with the lever *d*³ in the manner shown in Fig. 2. In this case the combined weight of the arm *d*⁷, rod *d*⁶, and the arm of the lever *d*³, to which the rod is connected, is sufficient to hold the valve 6 open when the receptacle *d*⁵ is empty. A charge of oil in the receptacle will tilt the lever in the direction required to close the valve.

I claim—

1. An oil-burner comprising a retort having a bottom formed to distribute oil discharged thereon and to return surplus oil toward the point of supply, and a receptacle arranged below and communicating with the retort for receiving such surplus oil.

2. An oil-burner comprising a retort having transverse ridges or barriers on its bottom, and gutters at the ends of said ridges.

3. An oil-burner comprising a retort having transverse ridges or barriers on its bottom, and gutters at the ends of the ridges, the said ridges being inclined toward the gutters.

4. An oil-burner comprising a retort having transverse ridges or barriers on its bottom, and a supply-pipe arranged to discharge oil crosswise of said ridges, gutters being formed for the return of surplus oil toward said supply-pipe.

5. An oil-burner comprising a base, a retort supported by the base, and having an opening or socket, a gas-supply pipe extending from the retort to a burner supported by the base, the burner being located below said opening, and a removable deflector formed to fit said opening, said deflector having an orifice in line with the orifice of the burner.

6. An oil-burner comprising a retort having
a bottom formed with oil-distributing ridges
and with gutters at the end of said ridges,
and the upper surface of said retort having
5 a dome, and a gas-outlet pipe connecting the
interior of the retort with the burner, the re-
ceiving end of the gas-pipe entering the dome.

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

WILLIAM R. SMITH.

Witnesses:

FRED A. HONDLETTE,
C. F. BROWN.