

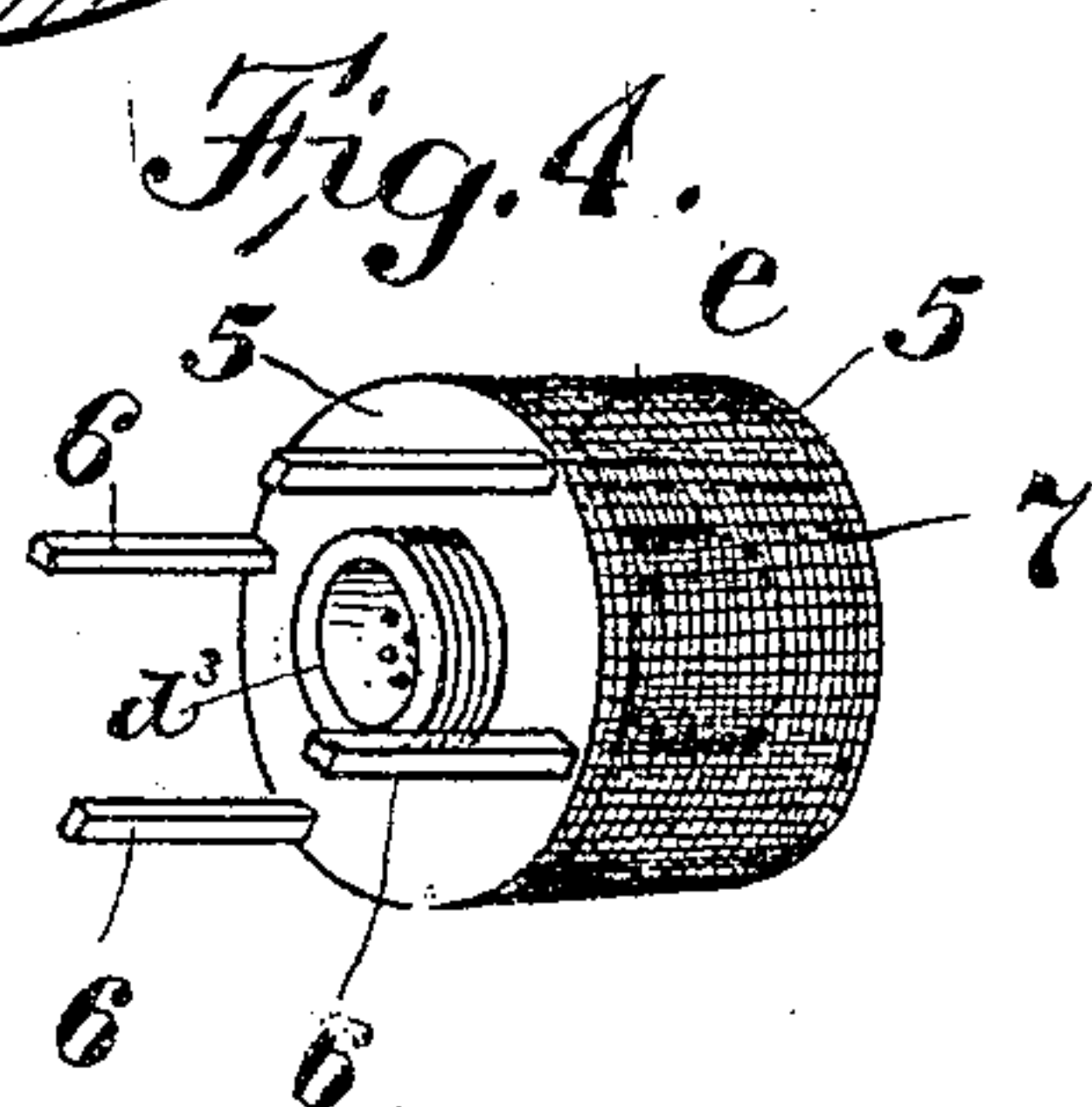
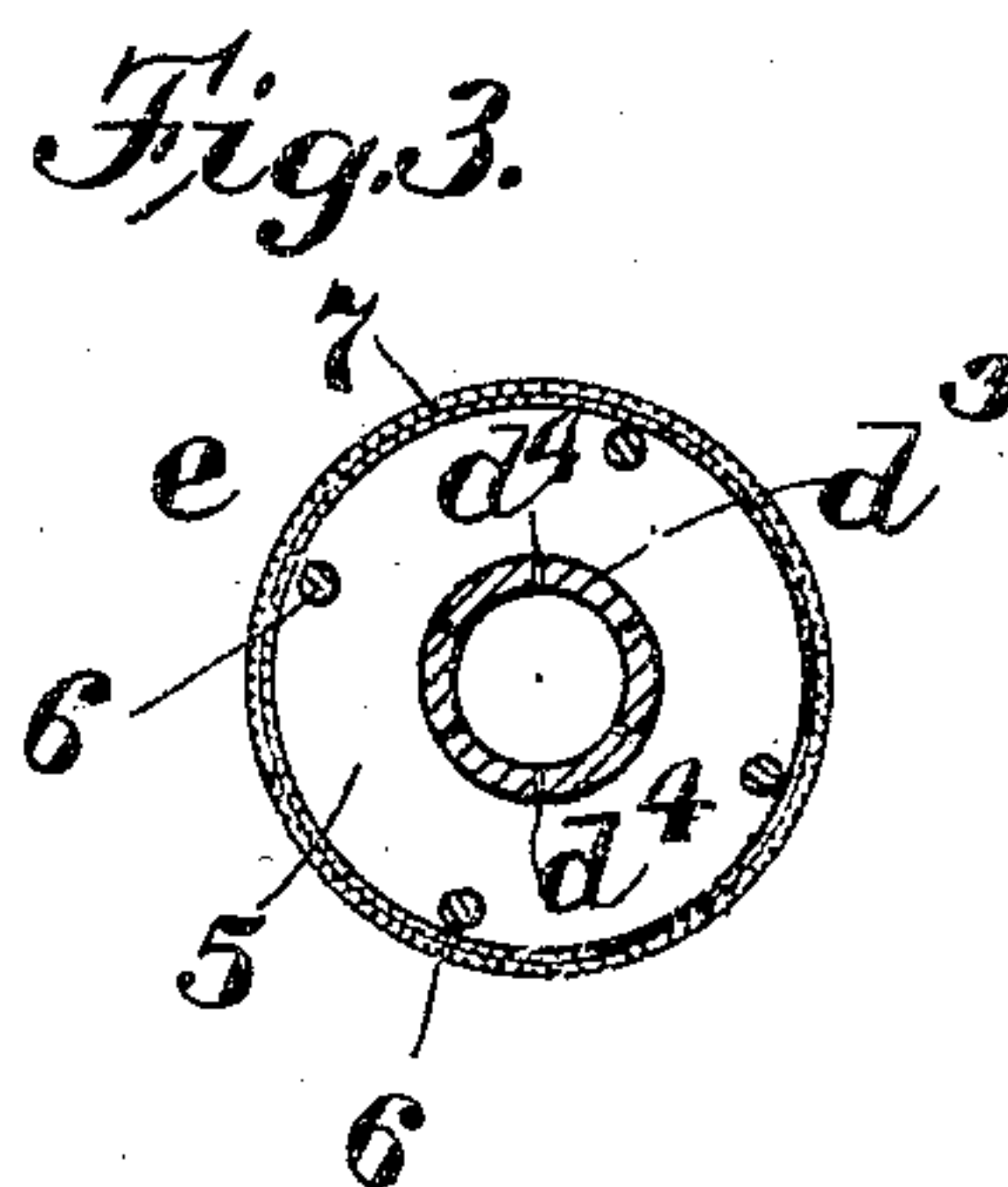
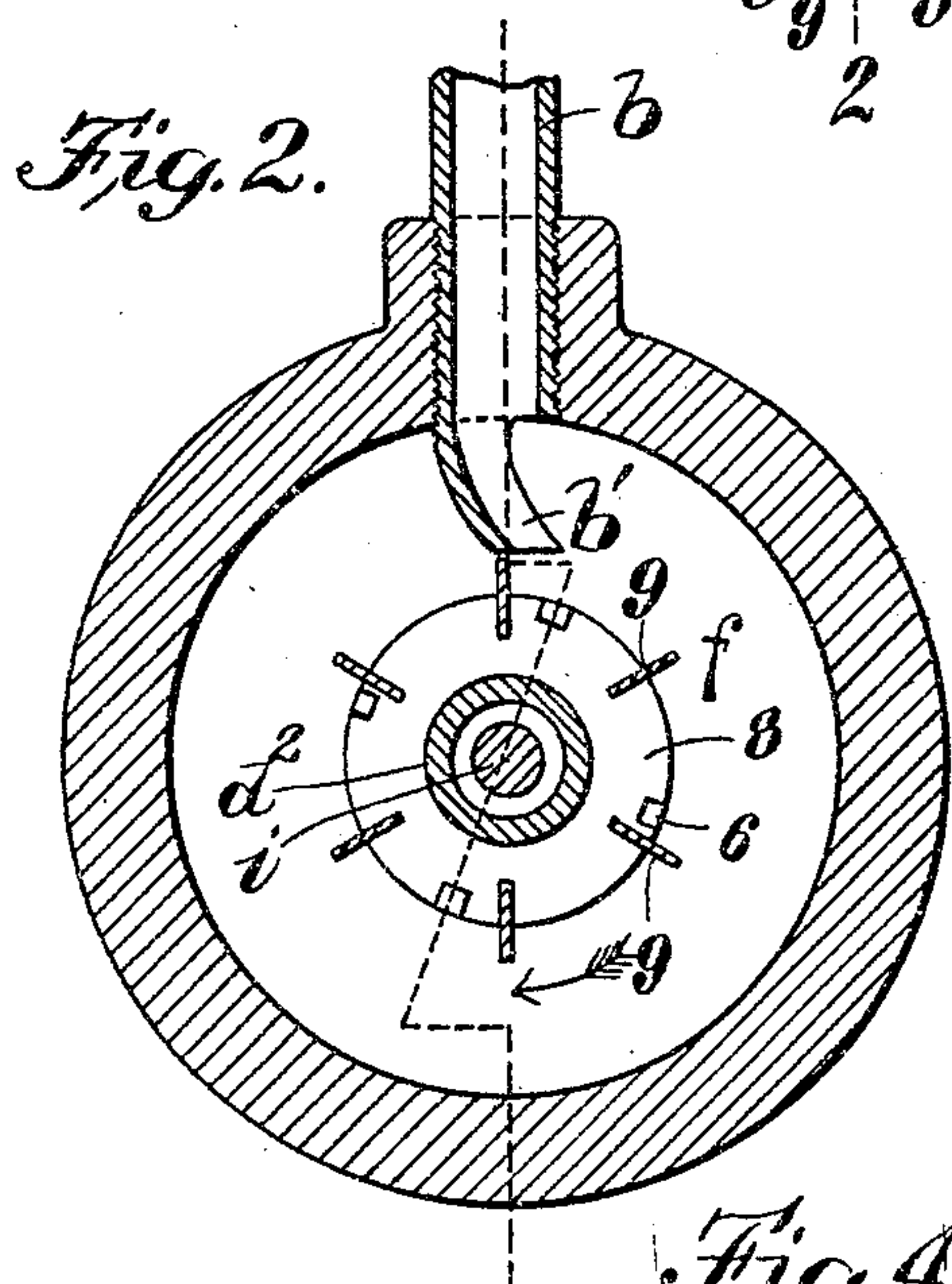
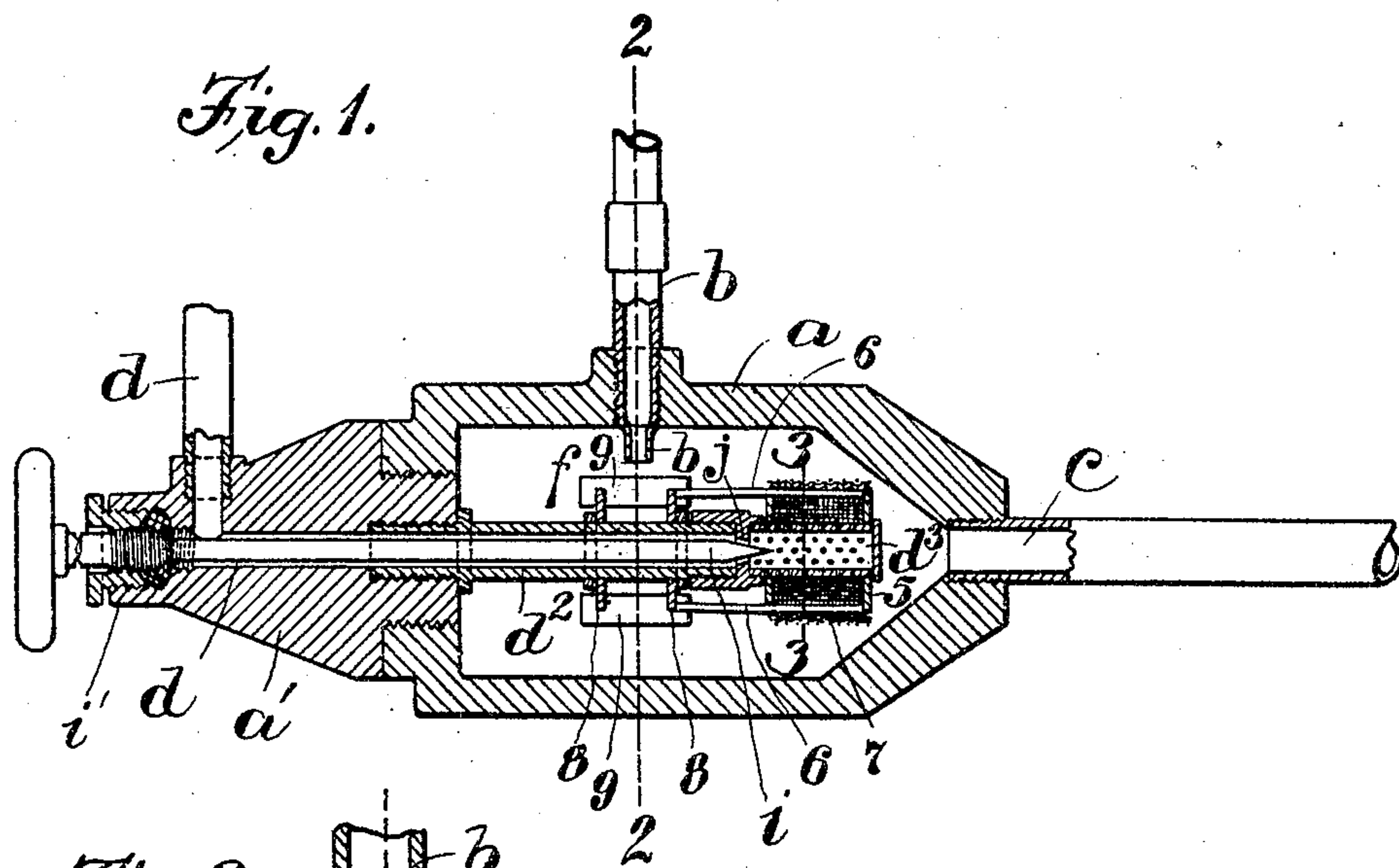
No. 773,543.

PATENTED NOV. 1, 1904.

A. F. CHACE.  
OIL BURNER.

APPLICATION FILED DEC. 23, 1903.

NO MODEL.



Witnesses:

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Attor.



# UNITED STATES PATENT OFFICE.

ALBERT F. CHACE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF,  
FRANCIS H. APPLETON, AND FRANCIS H. APPLETON, JR., OF BOSTON,  
MASSACHUSETTS.

## OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 773,543, dated November 1, 1904.

Application filed December 23, 1903. Serial No. 186,293. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT F. CHACE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to oil-burners or oil-consuming apparatus in which oil is atomized or reduced to fine spray and taken up by a current of air, the oil-laden air-current being supplied to a burner where the oil and the oxygen of the air are consumed.

The invention has for its object to provide improved means for atomizing the oil and for presenting it to the air-current, so that the oil atoms may be intimately mixed with the air and gas, and thereby to the burner-tip.

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

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of an oil-burner embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 1. Fig. 4 represents a perspective view of the oil-distributing cage detached from the oil-outlet.

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

In the drawings, *a* represents a casing which may be of cast-iron or other suitable material and is preferably cylindrical in form, one end being preferably tapering or frusto-conical.

*b* represents an air-pipe which is connected with one side of the casing and communicates with the source of supply of air under pressure.

*c* represents an outlet for the mixture of air and atomized oil, the said outlet being a tube extending to a burner-tip or forming a part thereof. The outlet *c* is preferably connected with the casing at the smaller end of the tapering portion thereof and is preferably arranged in alinement with the longitudinal center or axis of the cylindrical casing.

*d'* represents a head or plug which closes the end of the casing opposite the outlet *c*, the

said head containing a duct or passage *d*, through which oil enters the casing.

*d'* represents an oil-conducting pipe extending from a source of oil-supply and communicating with one end of the duct *d*.

*d''* represents a pipe or tube constituting an extension of the duct *d* and projecting from the head *d'* into the casing, the said tube *d''* being preferably in line with the outlet *c*, and therefore occupying the longitudinal center or axis of the casing. The tube *d''* is provided at its outer portion with a delivering-section *d'''*, provided with numerous small orifices *d''''*, Fig. 3, arranged to discharge oil outwardly in numerous small streams, the orifices *d''''* being preferably arranged radially.

*e* represents a disseminator comprising a rotary atomizing-screen surrounding the oil-delivering section or portion *d'''* and arranged to act on the radiating streams of oil, the said screen being sufficiently elongated so that when rapidly rotated it effects a thorough atomization of the oil and distributes it in the form of spray in the portion of the casing which surrounds the disseminator and intervenes between the air-inlet *b* and the burner-supplying outlet *c*. The finely-atomized oil is therefore thoroughly mixed with the air while within the chamber and before it escapes at the outlet. The screen *e* is preferably composed of two annular end pieces or heads 5 5, which are mounted to rotate upon the delivering-section *d'''*, rods or bars 6 6 connecting the heads 5 5 and extending parallel with the axis of the screen, and a foraminous covering or screen proper, 7, which is preferably of cylindrical form and is supported by the bars 6 between the heads 5. The screen 7 is preferably made of wire-cloth, and in practice I have employed two cylindrical layers of wire-cloth in making the screen—viz., an inner layer and an outer layer—the inner layer being of coarser mesh than the outer.

*f* represents a wind-wheel which is attached to the screen *e* and is arranged to be rotated by the air-current delivered to the casing by the pipe *b*, the rotation of the wind-wheel be-



ing imparted to the screen. In this embodiment of my invention the said wind-wheel is composed of two annular collars or hubs 8 8, mounted to rotate upon the oil-pipe  $d^2$ , and  
 5 blades 9, affixed to the hubs 8, and preferably radiating from the axis of rotation of the wind-wheel. The wind-wheel is affixed to the screen  $e$  by means of extensions of the screen-bars 6, said extensions being affixed to one  
 10 of the hubs 8 of the wind-wheel. The wind-wheel and the air-inlet  $b$  are so arranged relatively to each other that the current of air delivered by the pipe  $b$  impinges upon the blades of the wind-wheel in such direction as  
 15 to rotate the latter and the screen  $e$  in the direction indicated by the arrow in Fig. 2, the inner end of the air-pipe  $b$  being preferably provided with a deflector  $b'$ , formed to impart the desired direction to the air-current  
 20 and cause the latter to rotate the wind-wheel.

The oil atomized and distributed as described by the rotation of the screen is thrown into that portion of the casing through which the air passes on its way from the air-inlet to  
 25 the burner-supplying outlet. Hence the air-current takes up the atomized oil and carries it continuously away from the screen to the outlet  $c$ . The movement of the air and the atomized oil thus caused facilitates the out-  
 30 ward movement of the atomized oil from the screen and prevents the air-pressure from obstructing the outward movement or distribution of the oil, as might be the case if the screen were located out of the path taken by  
 35 the air from the inlet  $b$  to the outlet  $c$ . I regard this relative arrangement of the screen, the air-inlet, and the air and oil outlet as of much importance and as contributing materially to the effective operation of the appa-  
 40 ratus.

$i$  represents a needle-valve which has a screw-thread connection at  $i'$  with the head  $a'$  and extends into the oil-conduit, the conical acting portion of the valve coöperating with  
 45 a correspondingly-formed seat  $j$  between the tube  $d^2$  and the perforated delivering portion  $d^3$  in regulating the quantity of oil delivered.

In practice the oil is delivered to the apparatus under pressure, the pressure of the oil  
 50 being preferably equal to or greater than the pressure of air.

I have found that by the described apparatus I am enabled to successfully and effectively consume crude petroleum without the  
 55 formation of any accumulation of carbon or other residual matter in any part of the apparatus.

I do not limit myself to the described form and details of construction of the essential

features of the apparatus, and the same may be variously modified without departing from the spirit of the invention. 60

The opening in the casing covered by the removable head or plug  $a'$  is of sufficient size to permit the insertion and removal of the  
 65 screen and wind-wheel with the pipe  $d^2$ . Hence by unscrewing the head  $a'$ , which has a screw-thread connection, as shown, with the casing, the said parts can be readily removed to be in-  
 70 spected.

I claim—

1. An oil atomizer and burner comprising a mixing-chamber having an air-inlet and a burner-supplying outlet, an oil-conduit extending into the chamber and having a deliv- 75  
 ering portion located between the said inlet and outlet and adapted to deliver oil into the portion of the chamber through which the air passes from the inlet to the outlet, an elongated rotary atomizing-screen surrounding 80  
 said delivering portion and arranged to act on the delivered oil, and a wind-wheel connected with said screen and located in the path of the air-current from the said inlet.

2. An oil atomizer and burner comprising a 85  
 mixing-chamber having an air-inlet and a burner-supplying outlet, an oil-conduit extending into the chamber and having a perforated delivering portion, a rotary atomiz- 90  
 ing-screen journaled in the oil-conduit and comprising a foraminous cylinder surrounding the said perforated portion, and a wind-wheel also journaled in the oil-conduit and connected with the screen, said wheel being in the path of the air-current delivered to the 95  
 casing by the air-inlet.

3. An oil atomizer and burner comprising a mixing-chamber having an air-inlet, a burner-supplying outlet, and an opening at the end opposite said outlet, a head or plug formed to 100  
 close said opening and detachably connected with the casing, an oil-conduit attached to said head and projecting into the casing, said conduit having a delivering portion within the casing, a rotary screen and a rotary wind- 105  
 wheel connected therewith, both journaled in the oil-conduit, the screen surrounding the said delivering portion, while the wind-wheel is in the path of the air-current, said screen and wind-wheel being removable with the oil- 110  
 conduit and the head or plug.

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

ALBERT F. CHACE.

Witnesses:

C. F. BROWN,  
 E. BATCHELDER.