

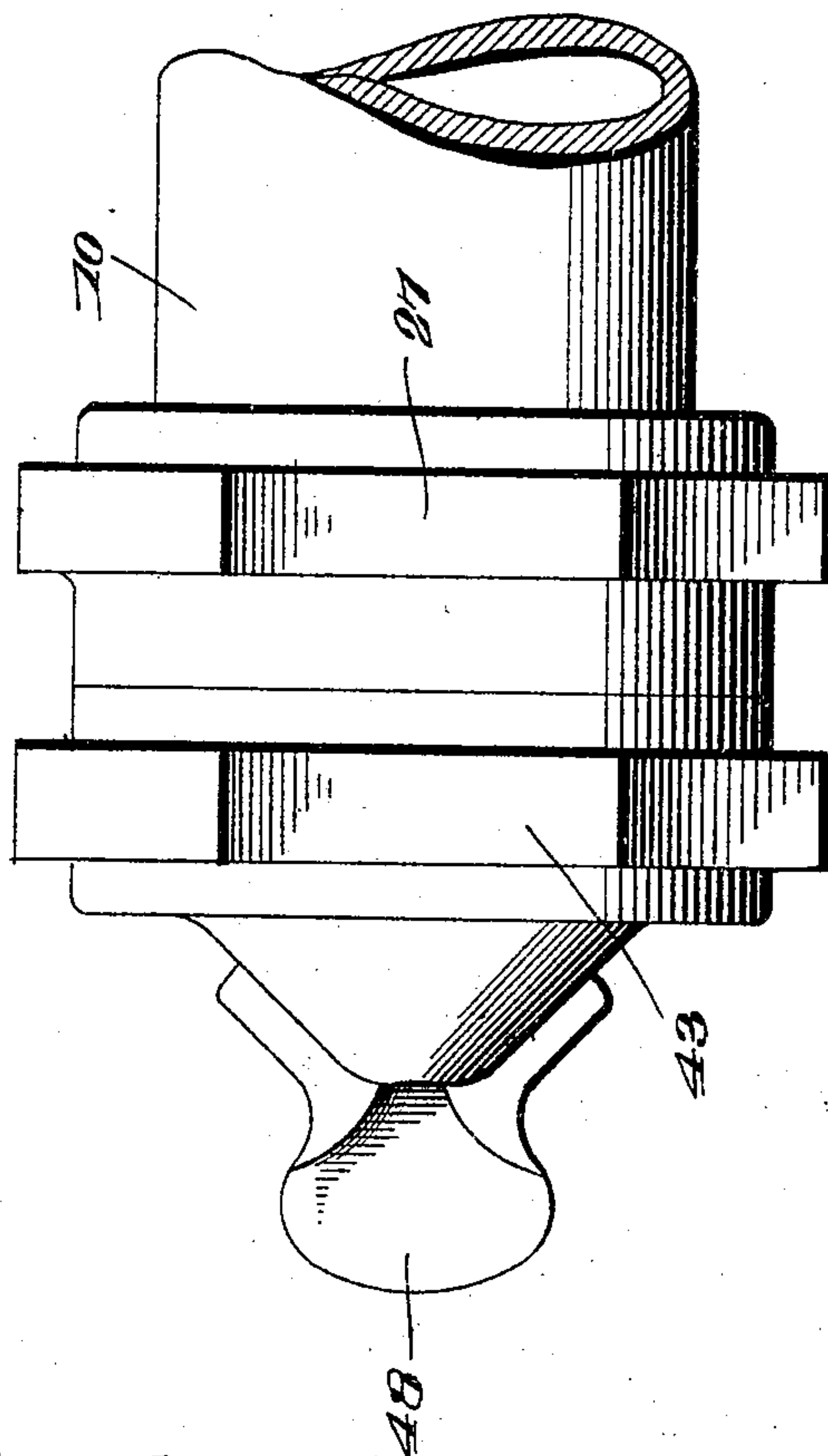
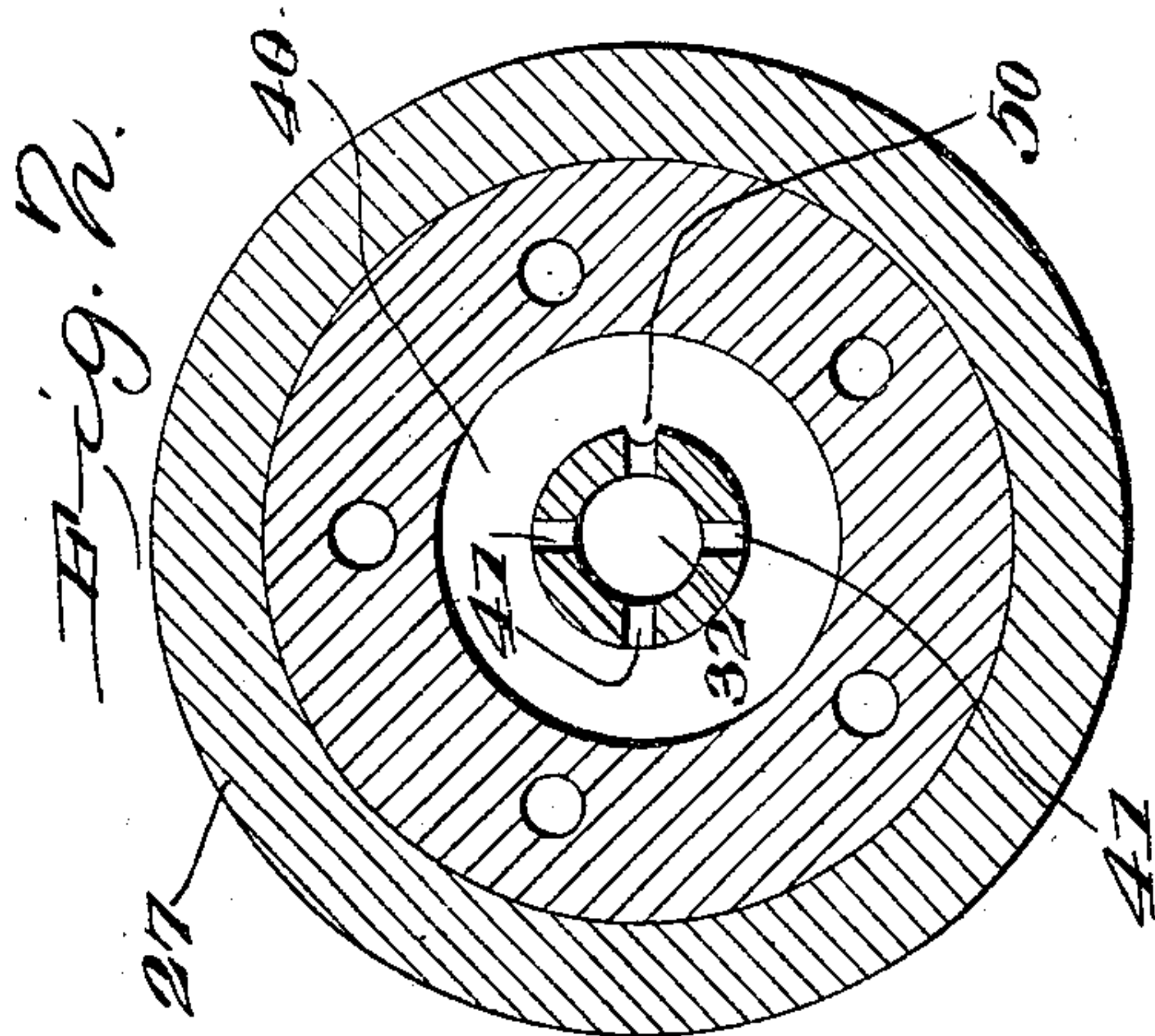
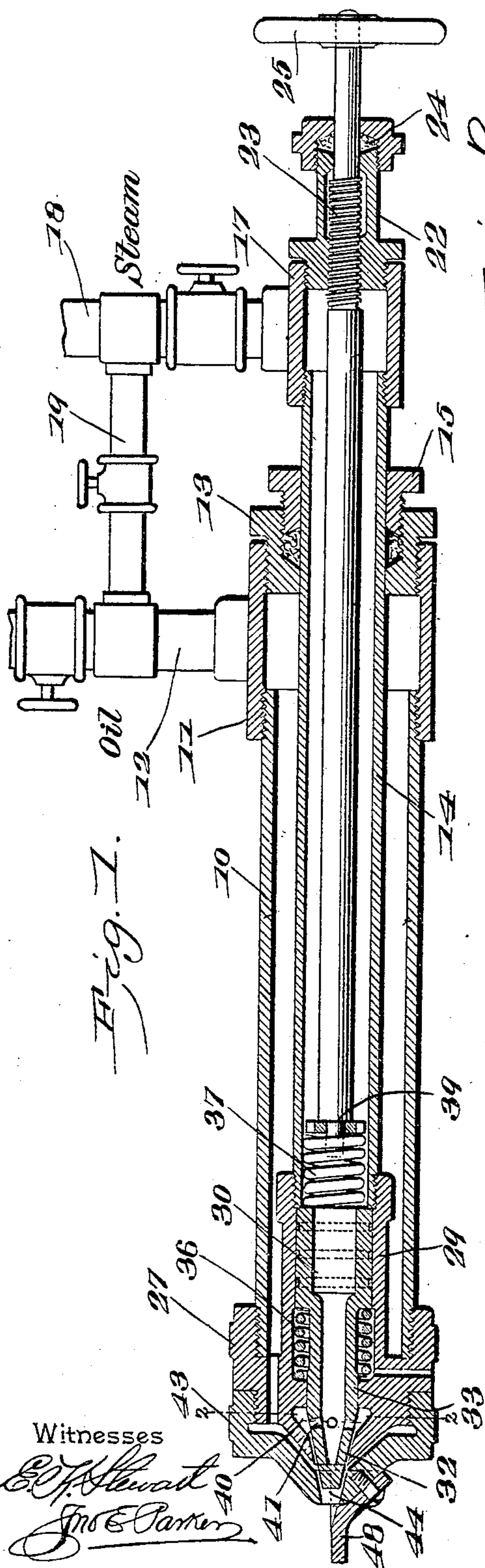
No. 801,360.

PATENTED OCT. 10, 1905.

E. CHRISTENSEN.

OIL BURNER.

APPLICATION FILED OCT. 26, 1904.



Witnesses

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UNITED STATES PATENT OFFICE.

EMIL CHRISTENSEN, OF PORTLAND, OREGON.

OIL-BURNER.

No. 801,360.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed October 26, 1904. Serial No. 230,084.

To all whom it may concern:

Be it known that I, EMIL CHRISTENSEN, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Oil-Burner, of which the following is a specification.

This invention relates to oil-burners, especially to burners of that class in which mingled steam and oil are utilized for heating steam-boilers and the like.

One of the principal objects of the invention is to provide an oil-burner in which the quantity of steam and oil passing through the burner may be readily controlled in accordance with the temperature or boiler-pressure desired without lessening the pressure or velocity of travel of the fluids.

A further object of the invention is to provide a novel form of burner in which the heated steam is utilized to raise the temperature of the oil and partly vaporize the same before the fluids issue from the burner.

A still further object of the invention is to provide an oil-burner in which ready adjustment may be accomplished in accordance with the pressure or temperature desired, so that when once adjusted the pressure of a steam-boiler may be automatically maintained.

A still further object of the invention is to provide a burner of the automatic type in which a pilot-light will be constantly maintained, so that when the main feed is cut out by excess pressure the flame will not be entirely extinguished and relighting rendered unnecessary.

A still further object of the invention is to provide a novel form of burner in which provision is made for readily blowing out any tarry or carbonaceous deposits which may form in the oil-passage.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of an oil-burner constructed in accordance with the

invention. Fig. 2 is a transverse sectional view of the same on the line 2 2 of Fig. 1, the view being on an exaggerated scale. Fig. 3 is a plan view of the inner end of the burner, also on an enlarged scale.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The outer casing of the burner is in the form of a tube 10, at one end of which is a T 11, to which is connected an oil-supply pipe 12. In the outer end of the T is screwed a ring-nut 13, through which extends a steam-supply tube 14, a nut 15 being screwed into such ring-nut and forming, in connection therewith, a packing-box to prevent the accidental escape of the oil. To the outer end of the steam-tube 14 is coupled a T 17, to which is connected a steam-supply pipe 18, there being a flanged by-pass 19 between the oil and steam pipes in order that steam may be admitted to the oil-tube when the latter becomes choked from accumulations of deposits. In the outer end of the T 17 is a nut 22, having internal threads for the threaded portion of a regulating-stem 23, that extends down through a suitable stuffing-box 24 and is provided with an operating-handle 25.

The steam-tube and the oil-tube are connected by a cylindrical block 27, having a pair of concentric threaded flanges for the reception of the threaded ends of the tubes, and the inner of these flanges forms a cylinder 29, in which is arranged a hollow piston 30, the periphery of said piston being provided with suitable packing-rings.

The piston 30 has a forwardly-extending portion that is tapered to form a valve 32, and said forwardly-extending portion is guided through an opening 33, formed in said block 27, the valve and piston being free to slide in the direction of the length of the oil-burner. The piston is thrust forwardly by the pressure of the steam entering its rear end; but its movement is resisted to some extent by a coiled compression-spring 36, arranged within the forward end of said cylinder, excessive rearward movement of the piston being prevented by the forward end of the steam-tube, the latter being of less diameter than said piston and forming a stop therefor. Within the steam-tube is a helical compression-spring 37, which exerts its force in a direction opposite to the spring 36, and said springs are of unequal strength, spring 36 being the strongest and exerting, say, one hundred pounds pres-

sure, while the spring 37 may be made to exert any desired pressure in order to assist the pressure of the steam in overcoming the stress of the spring 36. The rear end of the
5 spring 37 bears against a washer-ring 39, having a recessed periphery to permit the free passage of steam, and this pressure is carried by the adjusting and regulating stem 23, so that by turning said stem the stress of the
10 spring 37 may be adjusted in accordance with the desired pressure.

In the outer end of the block 27 is a steam-chamber 40, that is placed in communication with the interior of the valve 32 by a plurality of ports 41, and the forward wall of this
15 steam-chamber is tapered, being nozzle-like in contour, and the opening for the passage of the valve 32 being of a contour corresponding to that of the valve, an annular passage
20 being formed between the two when the valve is open.

On the block 27 is screwed a nozzle-head 43, that is also provided with a tapered discharge-opening 44, and this opening forms a seat for
25 the outer portion of the valve 32. Between the block 27 and the head 43 is an annular chamber having inclined walls, and said chamber is placed in communication with the oil-tube by means of a plurality of openings 46,
30 extending through the block 27.

Secured to the outer end of the nozzle 43 is a deflector-plate 48, the uppermost surface of which is in a plane a trifle below the axial plane of the burner, and the rear portion of
35 the deflecting-surface is slightly inclined on a line corresponding to the tapering wall of the discharge-opening 44.

In the operation of the burner steam and oil under pressure are admitted to the two
40 tubes, and when the device is used for the heating of the steam-boiler the steam is supplied directly from said boiler, and its pressure if in excess of that required will force the valve 34 to closed position, cutting off
45 both the oil and the steam chambers from the discharge-nozzle. When the boiler-pressure is low, the spring 36 forces the valve open to an extent proportioned to the pressure, and steam then flows through the ports 41
50 and the annular passage between the valve and the forward end of the block 27, where it meets a volume of oil in the annular recess of the nozzle and carries a thin film of oil down through the opening 44 and into contact with the deflector-plate 48, the latter
55 serving to slightly change the character of the issuing jet and produce a flat flame.

It is not desirable that the flame should be wholly extinguished even where the boiler-
60 pressure is in excess of that required, and in order to provide a pilot-light the periphery of the valve 32 is provided with a groove 50, extending from one of the ports 41 to the

ends of the valve. This groove is comparatively small; but it keeps the valve from closing to an extent sufficient to entirely shut off
65 the supply of fluid, and a small quantity of steam and oil will escape from the nozzle in readiness to ignite the larger stream when the valve opens.

Having thus described the invention, what is claimed is—

1. A two-fluid burner having at one end a hollow head provided with a tapering burner-orifice, a conical partition dividing the head
75 into steam and oil chambers, said partition having a tapered opening, the wall of which is in alinement with that of the orifice, a hollow tapering valve extending through the opening and orifice and provided with passages through which steam may pass to the
80 steam-chamber, concentric steam and oil tubes connected to the head, a spring of fixed resistance tending to maintain the valve in open position, and an adjustable spring tending to
85 close the valve.

2. In a two-fluid burner, a pair of tubes disposed one within the other and arranged one for the passage of steam and the other for the passage of oil, a cylinder arranged near
90 the discharge end of the inner tube, a piston-valve disposed in said cylinder and provided with openings for the passage of the steam, a discharge-nozzle arranged at the end of the burner and having an opening for the passage
95 of the fluids, the end of the valve extending into said opening and both opening and valve being tapered.

3. The combination in a burner, of a ported block having a pair of concentrically-disposed
100 threaded flanges, one of which also forms a cylinder, a pair of concentric tubes having threaded ends engaging said threaded flanges, a nozzle member secured to the block and having a tapered discharge-orifice, said nozzle member being further provided with an
105 annular chamber in communication with the ports of the block, a hollow piston arranged in the cylinder, a valve carried by the piston and adapted to close the burner-orifice, a
110 spring arranged within the cylinder and tending to resist movement of the piston under pressure, a second spring exerting its force in opposition to the first spring, a stuffing-box arranged at the outer end of the outer
115 tube, for the passage of the burner-tube, and a threaded stem arranged within the inner tube and serving as a means for adjusting the stress of said second spring.

In testimony that I claim the foregoing as
120 my own I have hereto affixed my signature in the presence of two witnesses.

EMIL CHRISTENSEN.

Witnesses:

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