

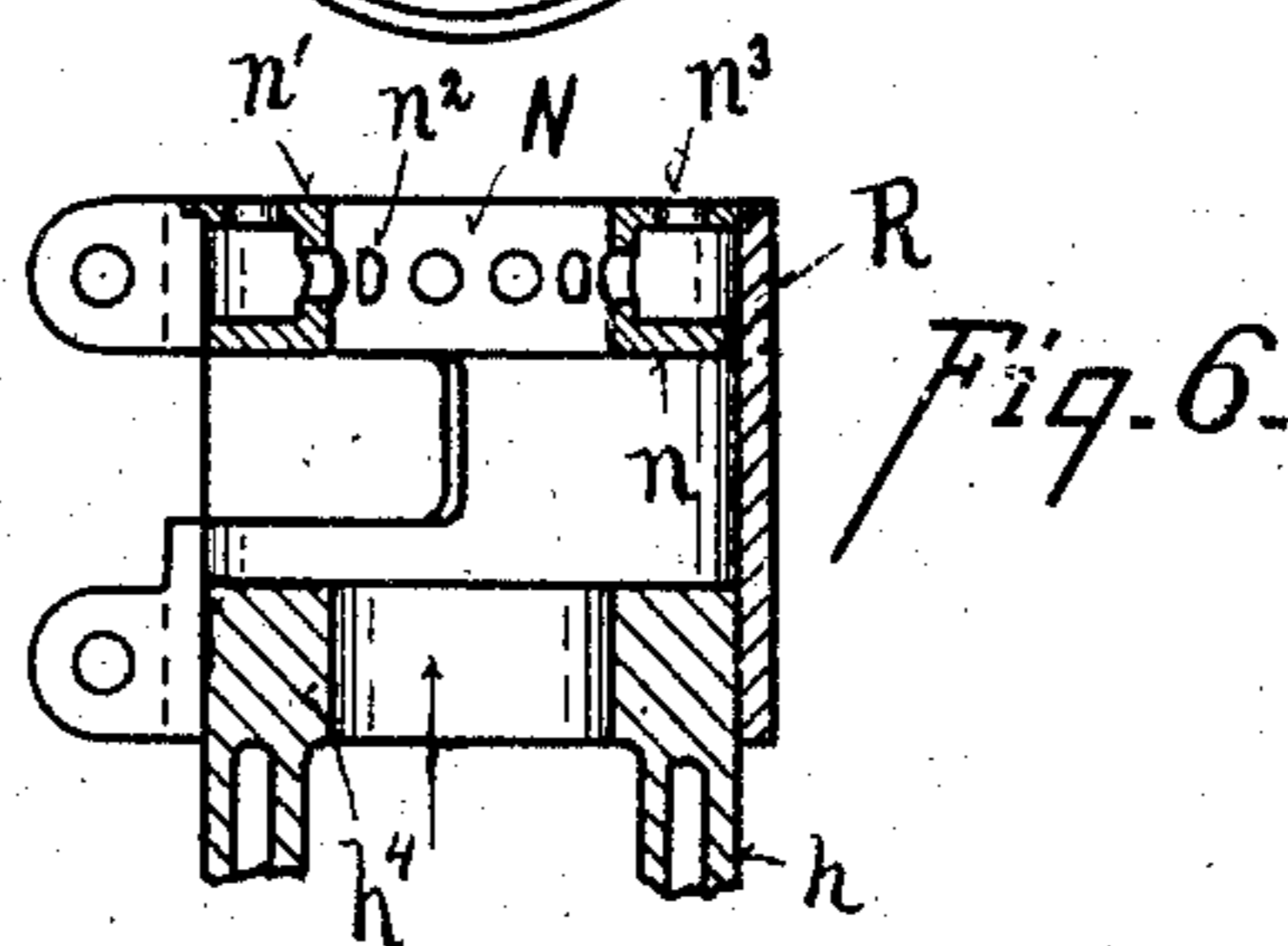
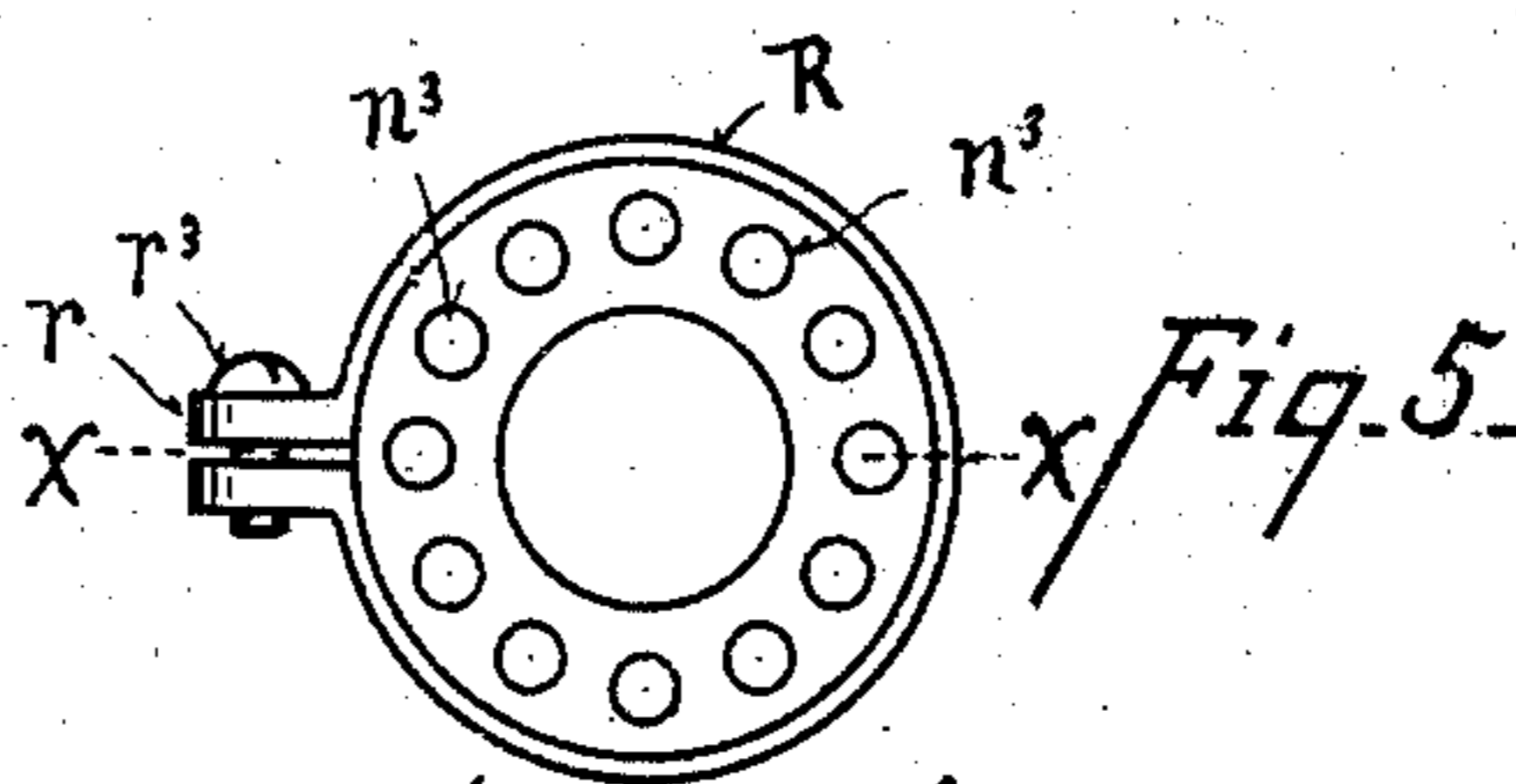
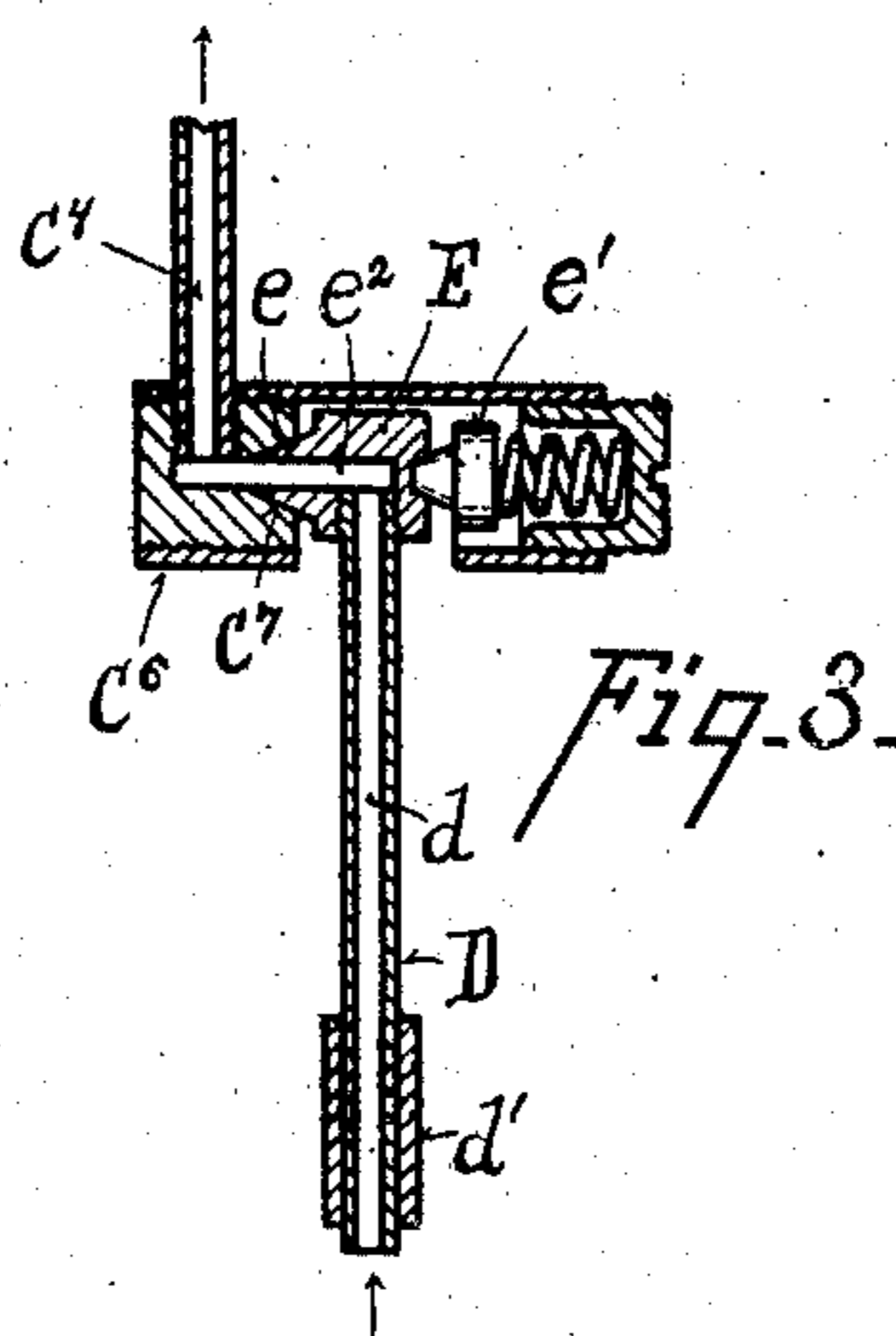
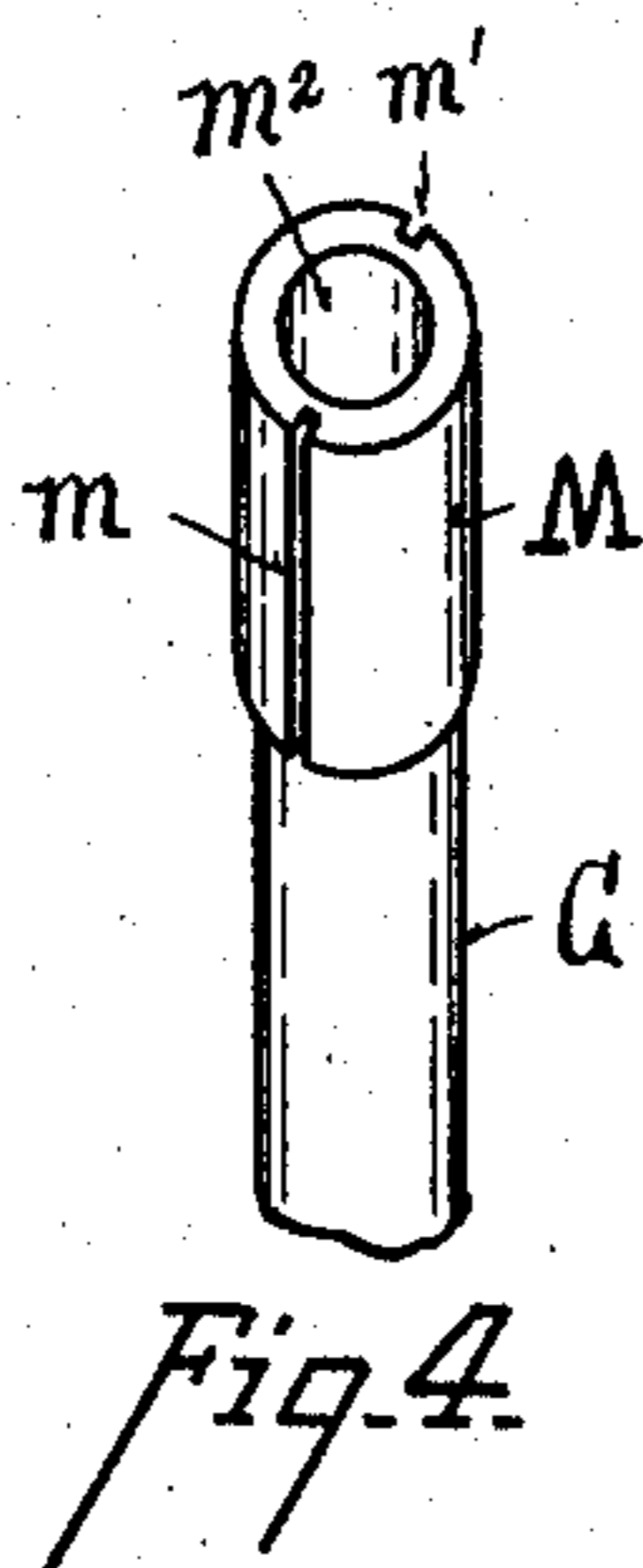
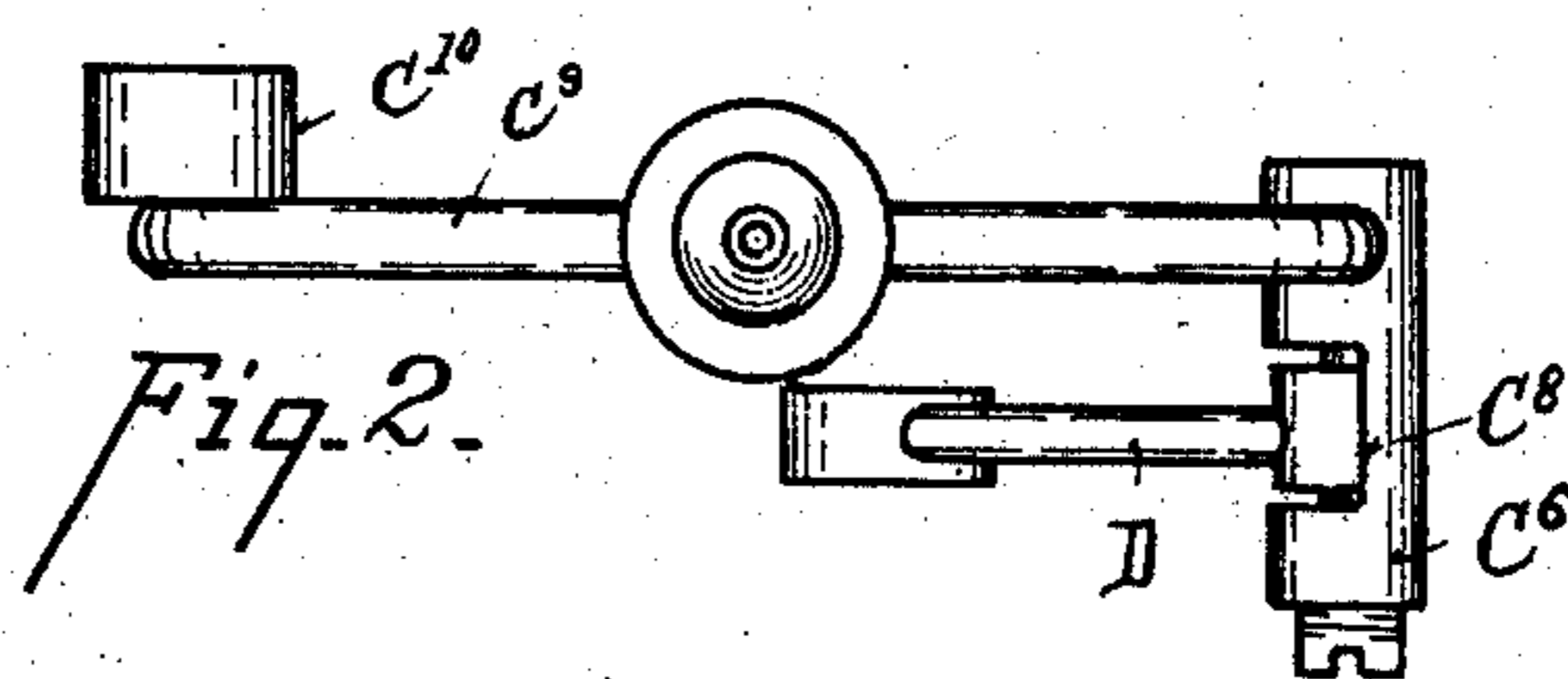
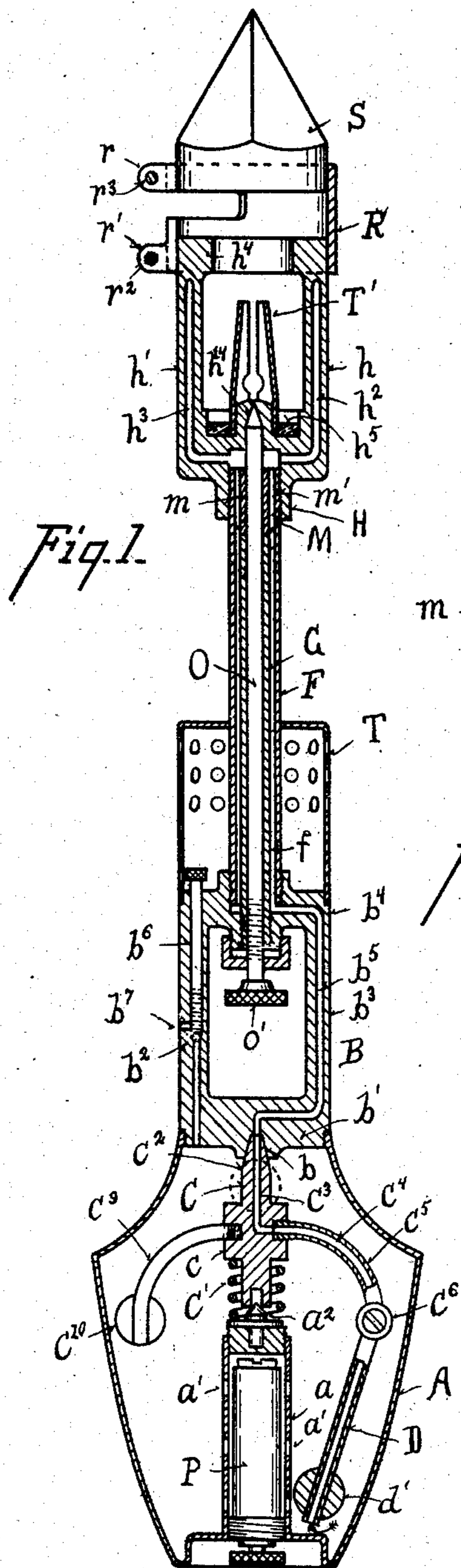
No. 844,473.

PATENTED FEB. 19, 1907.

W. F. RYAN.
SOLDERING IRON.

APPLICATION FILED NOV. 21, 1904.

2 SHEETS—SHEET 1.



Witnesses
C.W. Miles
A. McCormack.

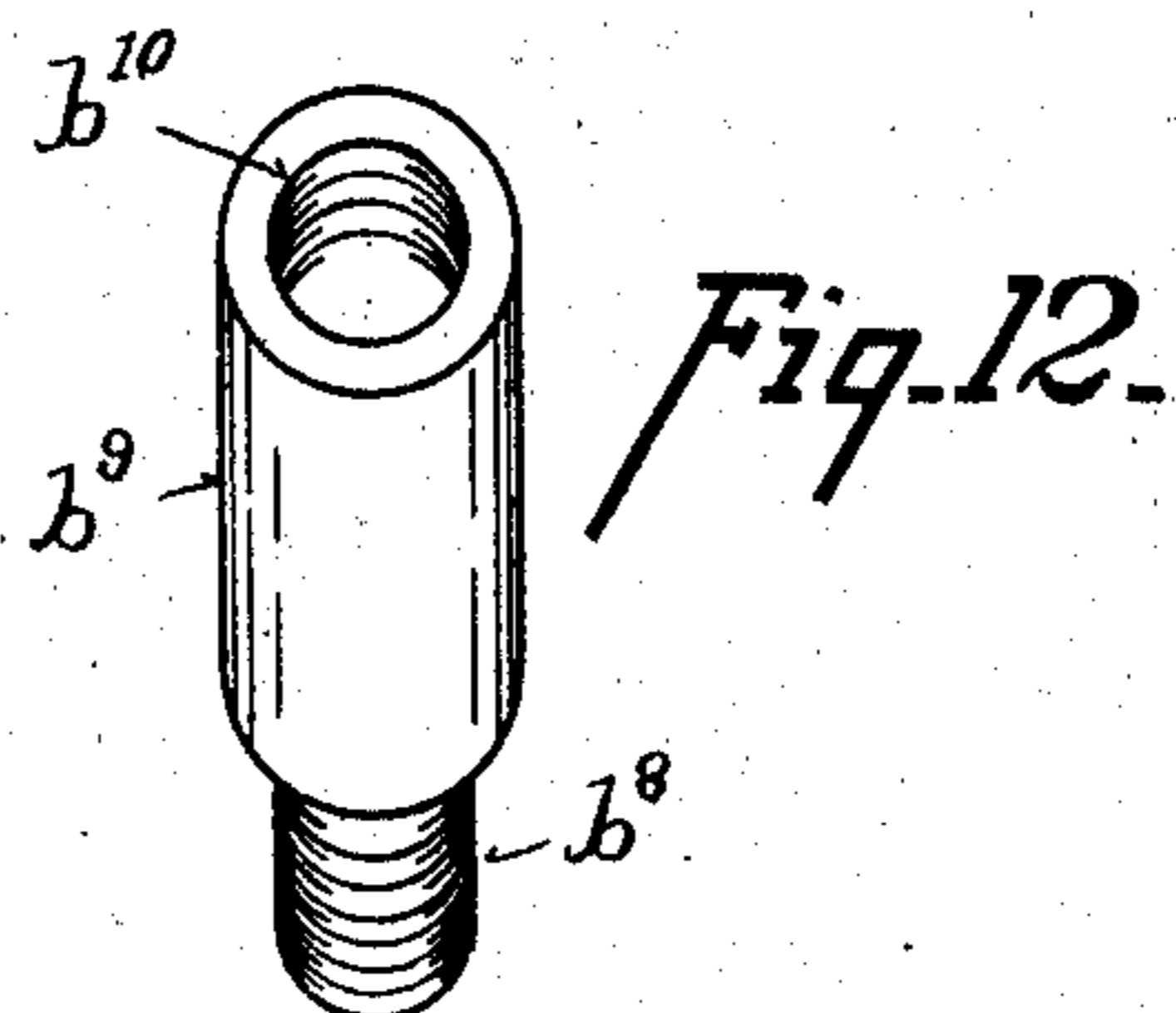
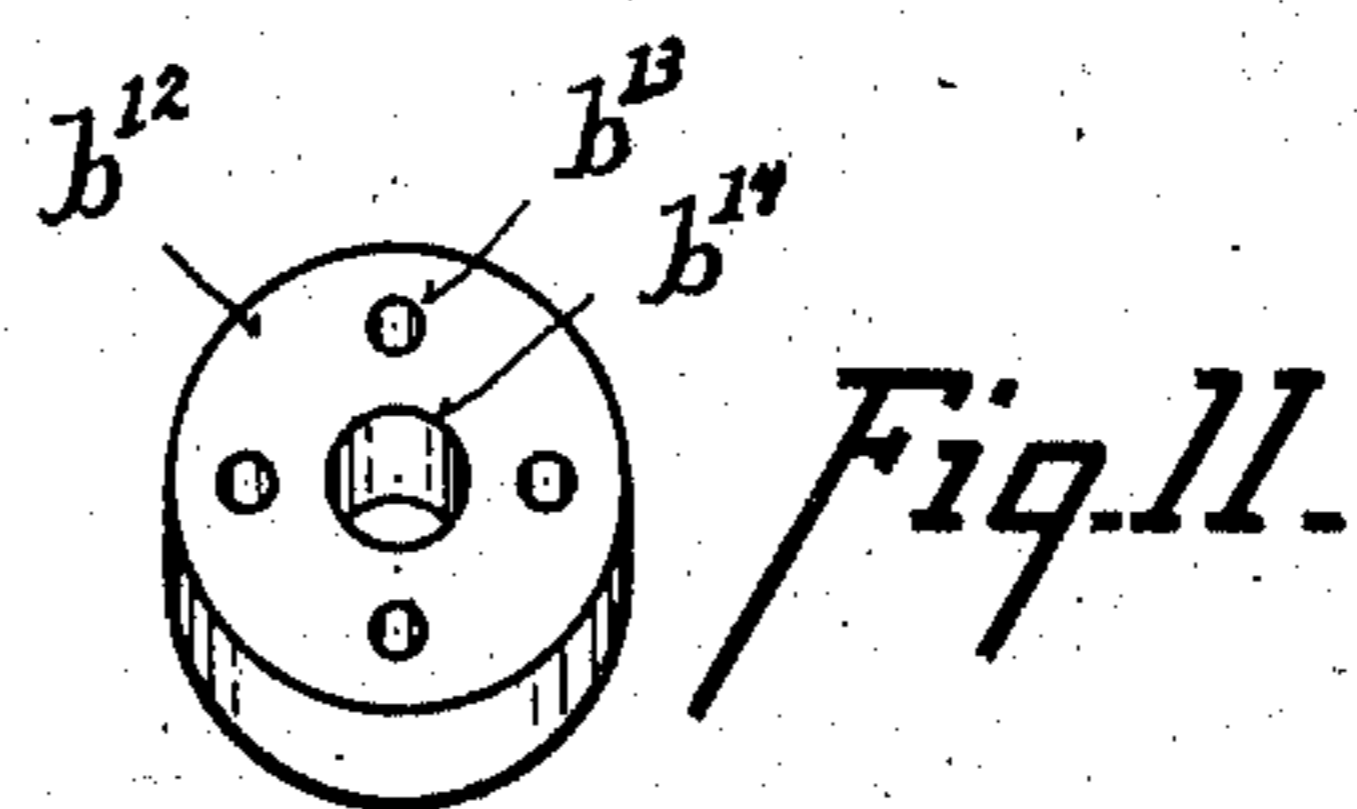
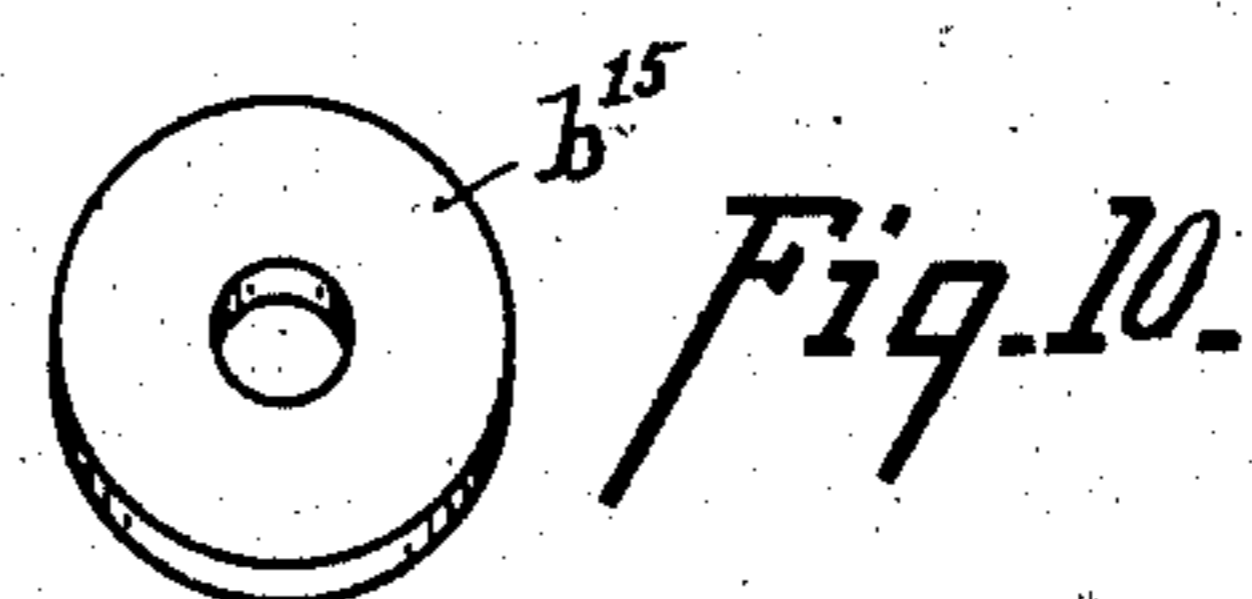
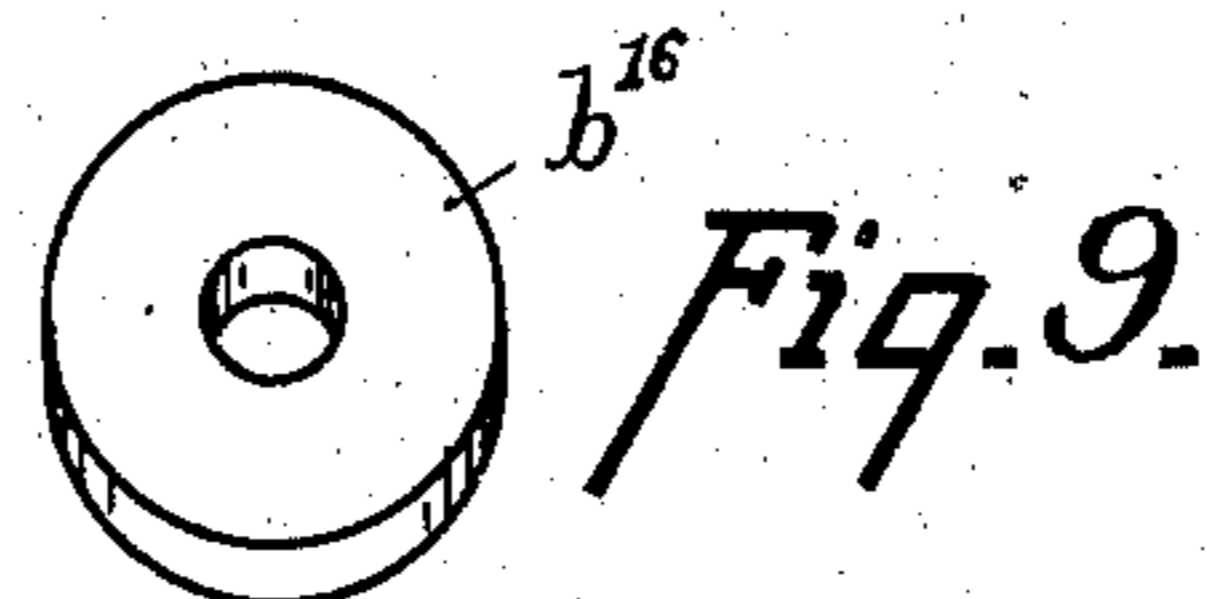
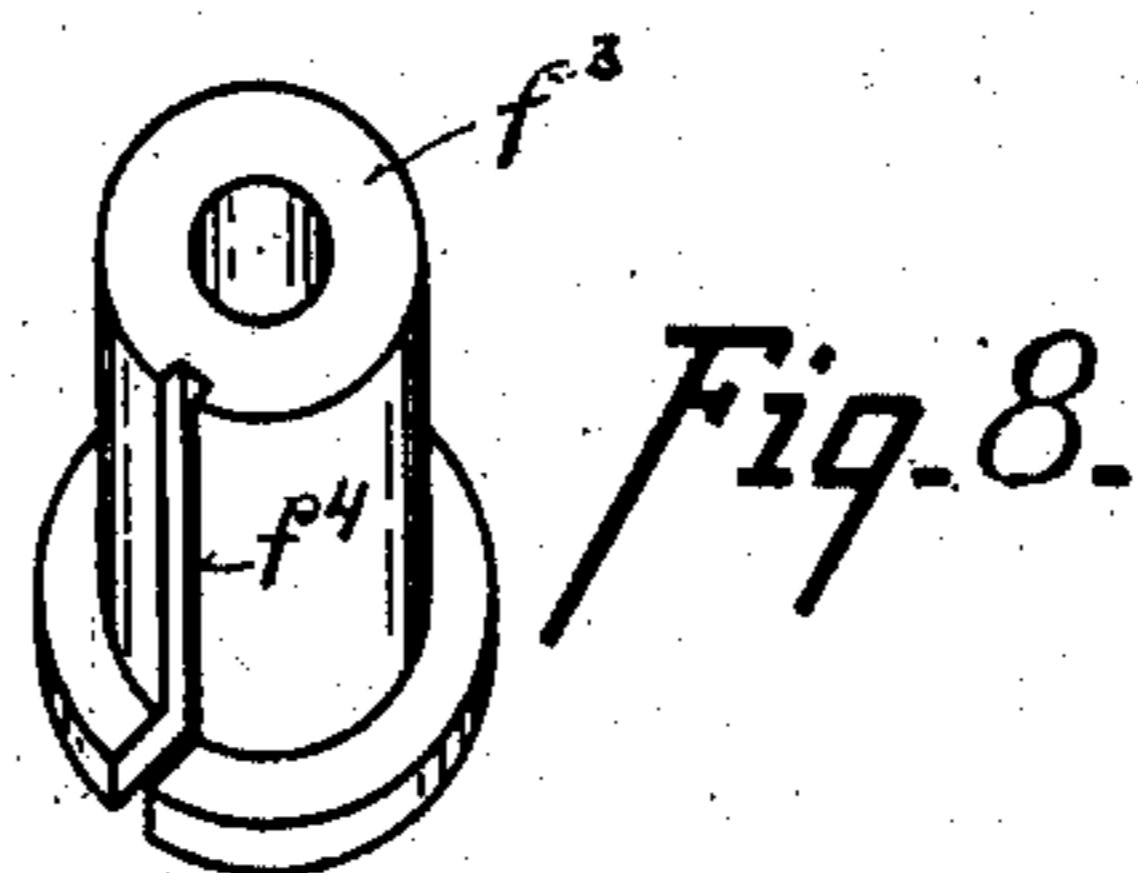
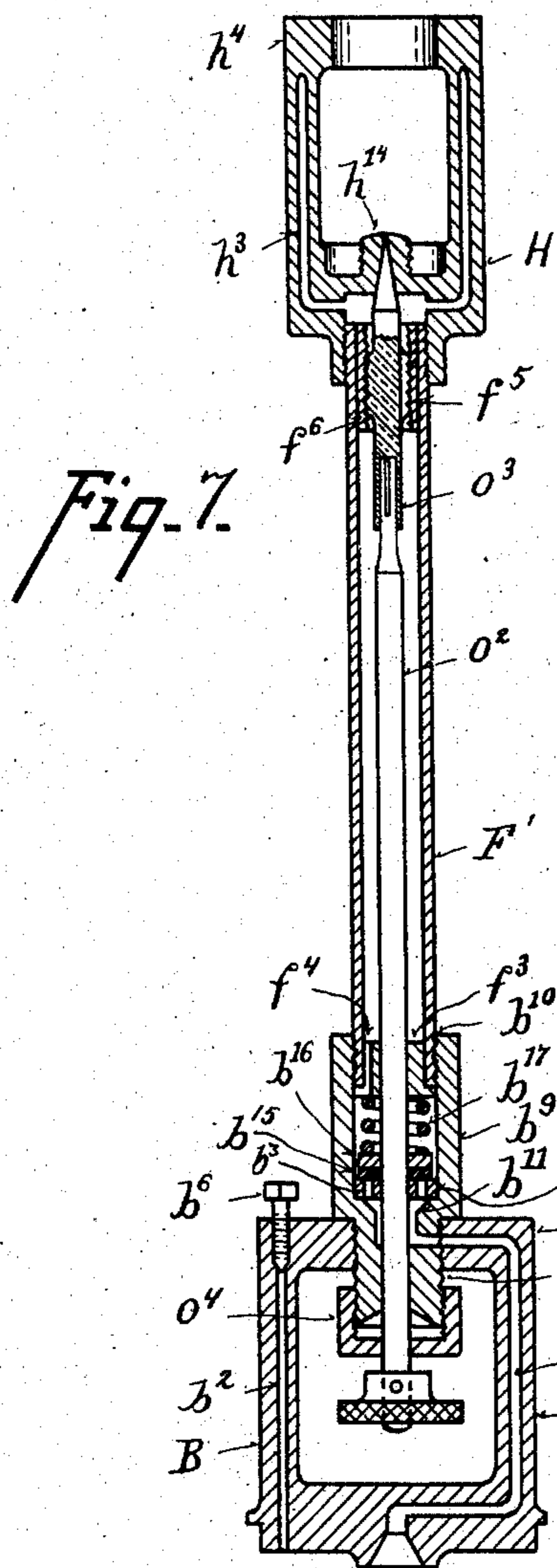
Inventor
William J. Ryan
By Walter J. Murray
Attorney

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2 SHEETS—SHEET 2.



Witnesses
C. W. Miles.
A. Mc Cormack.

Inventor
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Attorney

UNITED STATES PATENT OFFICE.

WILLIAM F. RYAN, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-THIRD TO
NEIL A. SULLIVAN AND ONE-THIRD TO LEWIS WILLIAM LINK, OF
CINCINNATI, OHIO.

SOLDERING-IRON.

No. 844,473.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed November 21, 1904. Serial No. 233,581.

To all whom it may concern:

Be it known that I, WILLIAM F. RYAN, a citizen of the United States of America, and resident of Cincinnati, county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Soldering-Iron, of which the following is a specification.

My invention relates to a soldering-iron of the character shown and described in the application filed in the United States Patent Office upon December 2, 1903, Serial No. 183,455, by myself and Neil A. Sullivan.

The object of my present invention is to provide a means whereby the oil is fed readily to the burner regardless of the position in which the iron may be held and which is provided with a ready means for keeping the oil-passage free from clogging.

In the accompanying drawings, Figure 1 is a central vertical sectional view of the soldering-iron embodying my invention. Fig. 2 is a top plan view, upon a somewhat enlarged scale, of the automatically-adjustable oil-feeder. Fig. 3 is a detail sectional view of the same. Fig. 4 is a detail perspective view of the upper end of the oil-passage. Fig. 5 is a top plan view of the burner. Fig. 6 is a sectional view of the same, taken on line $x-x$ of Fig. 5. Fig. 7 is a detail sectional view of my preferred form of the casting at the top of the reservoir, the vaporizer, and the channel connecting the two. Fig. 8 is an enlarged perspective view of the plug at the lower end of the fluid-channel. Figs. 9, 10, and 11 are detail views of parts of the valve for preventing back pressure of vapor into the reservoir. Fig. 12 is a detail perspective view of the casing of said valve.

Referring to the parts, located in the bottom of the oil-reservoir A is a central vertical sleeve a , within which is seated a pump-housing P, which is made removable, so that oil may be admitted to the reservoir through perforation a' in the side of sleeve a . After the oil has been placed in the inverted reservoir the pump-housing is to be replaced in the sleeve a , and pressure is to be placed upon the oil in the reservoir by the pump. Upon the top of the sleeve a is formed a tapered journal-bearing a^2 , between which and a beveled seat b of the bottom b' of a casting B, which forms the top of the reservoir A, is journaled a rod C, which has a collar c , up against which a light spring c' presses to hold

the upper tapered end c^2 of the rod snugly in contact with the seat b .

Rod C has a central channel c^3 extending into the collar c , which communicates with a channel c^4 in a curved tube c^5 , which is tapped into the collar c at one end, the other end being tapped into a tube c^6 , within which is seated a rotating coupling E, which has a beveled stud e , seated in end c^7 of the tube c^6 and seated on the other side against a spring-pressed disk e' . Coupling E has a channel e^2 , which communicates at one end with channel c^4 and at the other end with a channel d in the tube D, which is tapped into coupling E and carries a weight d' at its other end. Tube c^6 is cut away at c^8 to permit the tube D to have a revolution through an angle to permit the weighted end thereof to pass from the bottom to the top b' of the reservoir A when the same is inverted. Extending from a diametrically opposite point of collar c from that at which tube c^5 is secured to it is a curved arm c^9 , upon the end of which is a weight c^{10} . Weight c^{10} assists weight b' in causing the rod C to rotate, so that the end of the tube D is upon the side of the reservoir A toward the ground, so that when held in a position such that the length of the burner is horizontal or slightly inclined to the horizontal end of the tube D always remains in the oil. When the reservoir is inverted, so that it is at a higher point than the soldering-tip, the revolution of the tube D about the sleeve c^6 causes the end of the tube D to follow the travel of the oil, so that in whatever position the reservoir may be the end of the tube automatically retains itself in the oil to lead the same into the channel c^2 .

Casting B has two arms b^2 b^3 , which terminate at their upper end in a disk b^4 . Arm b^3 has a channel b^5 , which communicates with channel c^2 and at the upper end communicates with a channel f , left between tubes F and G, which are secured at their lower ends to disk b^4 . Tube F at its upper end is secured to a vaporizer H, which has arms h and h' upon opposite sides, within which are formed chambers h^2 h^3 and which has a central needle-valve seat h^{14} . Tube G stops below the upper end of the tube F, within whose upper end is seated a removable plug M, which has contracted longitudinal grooves m m' upon its sides, which register with the

channel f . Plug M rests upon the upper end of tube G and has a central channel m^2 , which registers with the channel in tube G, through which a needle-valve stem O extends upward through the plug and against the needle-valve seat h^4 , the lower end of the stem O receiving a thumb-screw O', which stands between the arms b^2 b^3 .

The arms h h' terminate in a ring h^4 , which is encircled by a split tube R, which has lugs r r' adjacent to each of the edges to receive screws r^2 r^3 , the lower to clamp the tube R to ring h^4 and the upper to clamp the soldering-tip S in place. Over the end of needle-seat h^{14} is a burner T'. Surrounding the tube F and between casting B and vapor-chamber H is a perforated sleeve T, by which the operator may hold the iron.

The operation is as follows: After the air-pressure has been placed upon the oil in the tank the needle-valve is opened, and a small amount of oil drops into the ignition-cup h^5 , where it is ignited. The heat of the flame vaporizes the oil in the chambers h^2 h^3 , and the heat is conveyed to the plug M. The size of the grooves m m' is such that after the heating has commenced nothing but vapor will pass up through these grooves, and the heat in the chambers h^2 h^3 superheats this vapor, so that the combustion at the burner D is efficient. Should it be desired to clean the grooves m m' , it may readily be accomplished as follows: The pressure in the reservoir A is released first by opening the valve b^6 , which allows the pressure to be lowered through port b^7 . Then the vapor-chamber H is removed from the tube F, and the plug M may be taken out of the end of tube F for the purpose of cleaning it. Should it be desired to use the iron as a blower, the tip S is removed, and a burner N, which consists of flat rings n n' , coupled by a vertical wall n^2 , is placed upon the upper end of the tube R, the ring n being of a size to pass within the tube and the ring n' of a size to rest upon the top thereof. Ring n' has a series of holes n^3 placed in it, and wall n^2 has a set of perforations n^4 . When the flame is directed up through casting N, the air enters through perforations n^3 and n^4 and tends to make the combustion more perfect.

In Figs. 7 to 12 I have illustrated the preferred form of fluid-channel. In this form the disk b^4 of the casting B has a central screw-threaded perforation, which receives the lower end b^8 of the casing b^9 , whose upper end b^{10} is internally screw-threaded to receive the lower end of tube F', which at its upper end is coupled to the vaporizer H. Tube F' has at its upper end an internally-screw-threaded collar f^5 and at its lower end a plug f^3 , in which is a groove f^4 . Casing b^9 has a central port b^{11} , which communicates with oil-passage b^5 . Extending centrally through the casing b^9 and the tube F' is a

valve-stem o^2 , which at its upper end is splined to the needle-valve o^3 . Needle o^3 is externally screw-threaded to engage the internal screw-threads of collar f^5 , the screw-threads being cut away upon side f^6 to form a small passage for the vapors from tube F' into the vaporizer H. The advantage of making the needle-valve o^3 and the stem o^2 in two parts is that they have a certain amount of play relatively to each other, which enables the needle-valve to obtain a firm seat. Within casing b^9 is a disk b^{12} , which has a perforation b^{14} to pass through the stem o^2 and perforations b^{13} . Disk b^{12} is seated against the port b^{11} . Upon the disk b^{12} is a leather washer b^{15} and a metal washer b^{16} , both of whose diameters are of slightly smaller diameter than the interior of casing b^9 and against which a coiled spring b^{17} bears, the upper end of the spring bearing against the plug f^3 . The pressure of the oil through passage b^5 causes it to pass through perforations b^{13} to raise washer b^{15} and to pass thence up into the casing b^9 and then through groove f^4 into tube F', where it is heated and passes as a vapor through opening f^6 into the vaporizer. An excess of back pressure in the tube F' would carry the disks b^{15} and b^{16} firmly down against the disk b^{12} , closing the perforations b^{13} and prevent the vapors from forcing itself back into the reservoir. This effect is especially advantageous when the iron is inverted, as it is in this position that the vapor has a strong tendency to return into the reservoir. At the lower end of the valve-stem is a packing-nut o^4 . The packing within this nut may be readily replaced by simply unscrewing the nut and the valve-stem, allowing them to descend a short distance below the extension b^8 . The advantage of the screw-threaded needle-valve is that the screw-threads continuously clean out the exit of the collar, and thus the passage f^6 , formed by the flat side of the screw-threaded portion, never becomes clogged.

What I claim is—

1. The combination of an oil-reservoir, a channel leading therefrom, a rod journaled revolubly within the reservoir, and having an oil-passage within it communicating with the channel, a feed-tube secured at one end to the revolving rod communicating with its channel and weighted near its other end.

2. The combination of an oil-reservoir, a channel leading therefrom, a rod journaled revolubly within the reservoir and having an oil-passage through it communicating with the channel, a jointed feed-tube secured at one end to the revolving rod and communicating with the channel, a rotating coupling located at the joint of the feed-tube and a weight upon the end of the tube to cause it to rotate about the rod and about the joint.

3. The combination of an oil-reservoir, a central projection upon the bottom of the

reservoir, a central longitudinal rod jour-
naled between said projection and the top of
the reservoir, a channel leading from the top
of the reservoir, a passage through the rod
5 communicating with the channel, a feed-
tube secured to the rod at one end commu-
nicating with its passage and having a
weight near its other end to cause the rod to
revolve to keep the feed-tube in the oil as the
10 reservoir is turned.

4. The combination of a reservoir having
a central projection upon its bottom, a ro-
tating rod journaled between the projection
and the top of the reservoir and having a
15 passage communicating with a passage lead-
ing from the top of the reservoir, a jointed
feed-tube connected to the rod and commu-
nicating with its passage and a rotating
coupling at the joint of the feed-tube, and a

weight upon the end of the feed-tube to 20
cause its end to follow the oil as its position
changes with the turning of the reservoir.

5. In combination a reservoir, a vaporizer,
a channel connecting the vaporizer and the
reservoir, a burner, a clamping-tube over the 25
burner, an auxiliary burner or blower con-
sisting of two flat rings connected at their
inner periphery by a cylindrical wall, the
lower ring being imperforate and contacting
the walls of the clamping-tube, the upper 30
ring and the connecting-wall being perforated
to pass air to the flame to assist in the com-
bustion.

WILLIAM F. RYAN.

Witnesses:

WALTER F. MURRAY,
AGNES McCORMACK.