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PATENTED JULY 31, 1906.

A. M. HUNT & T. MIRK.
OIL OR HYDROCARBON BURNER.
APPLICATION FILED AUG. 31, 1903.

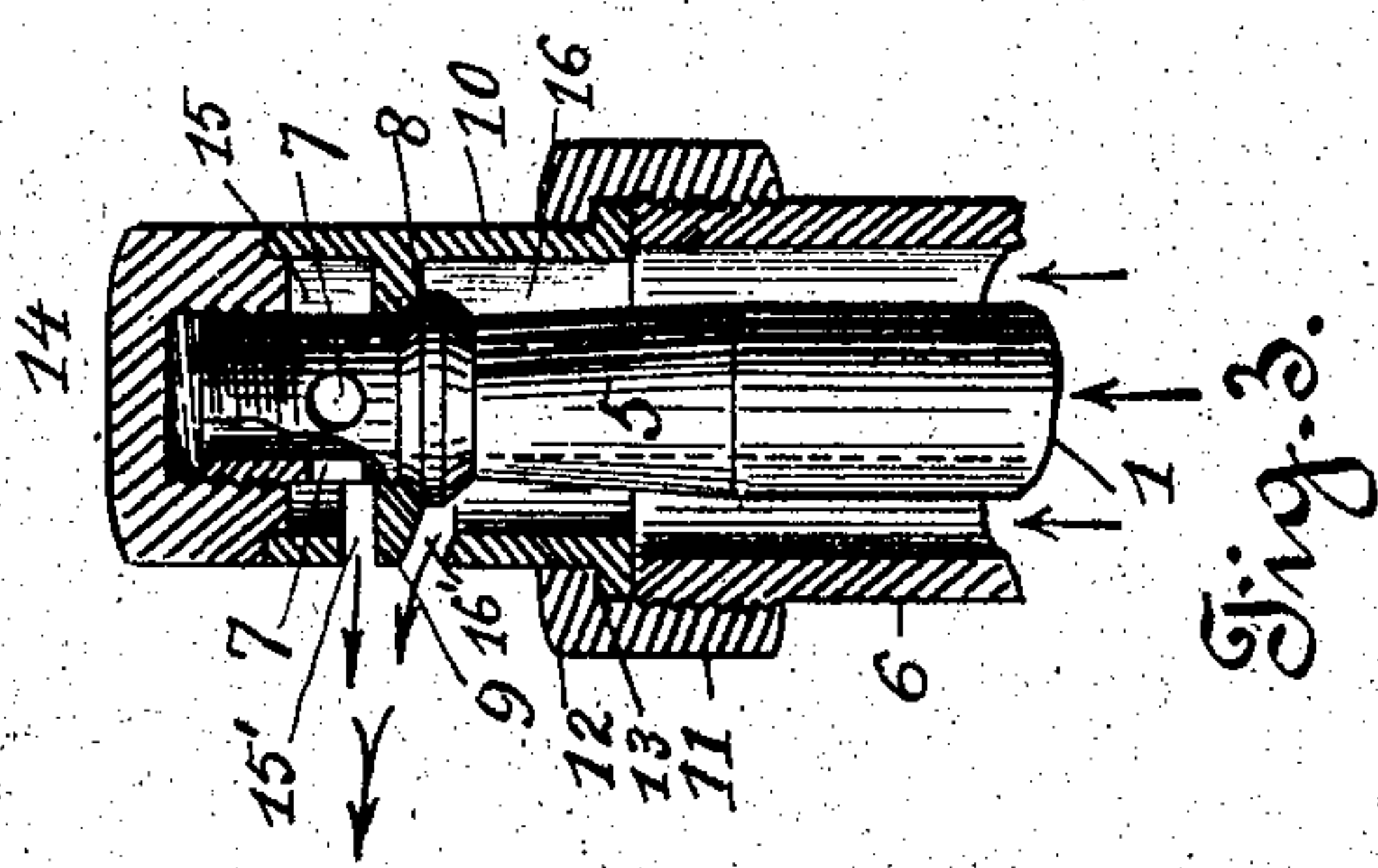


Fig. 3.

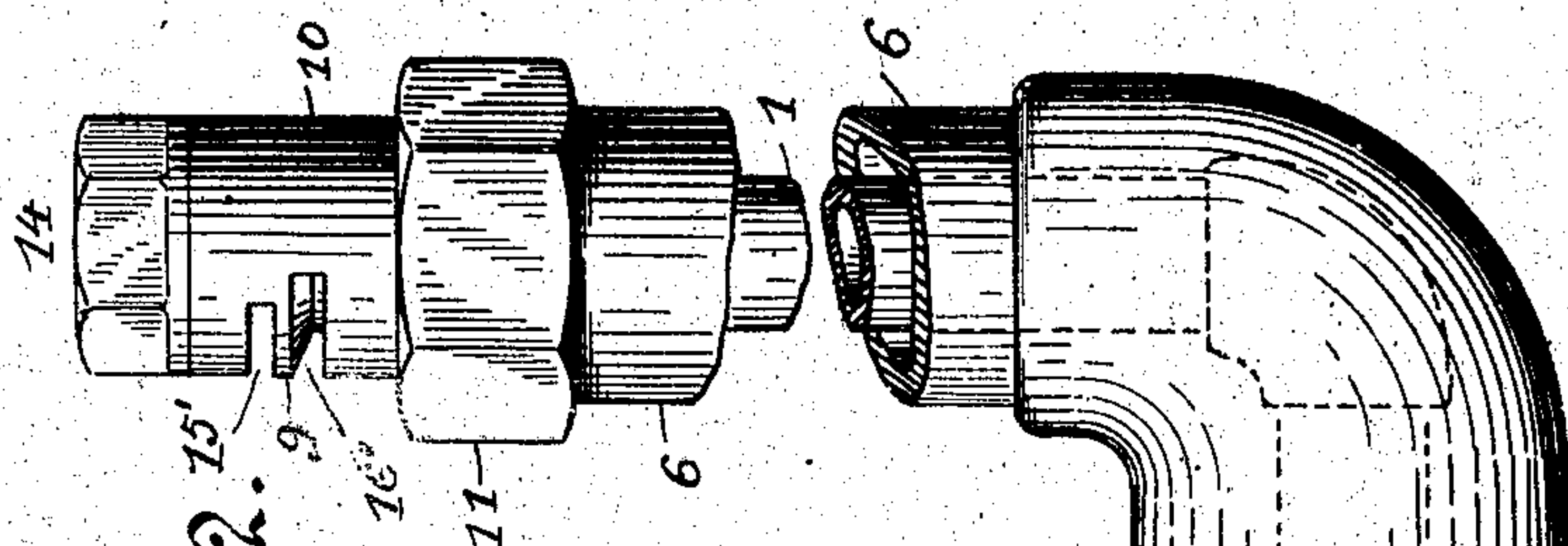


Fig. 2.

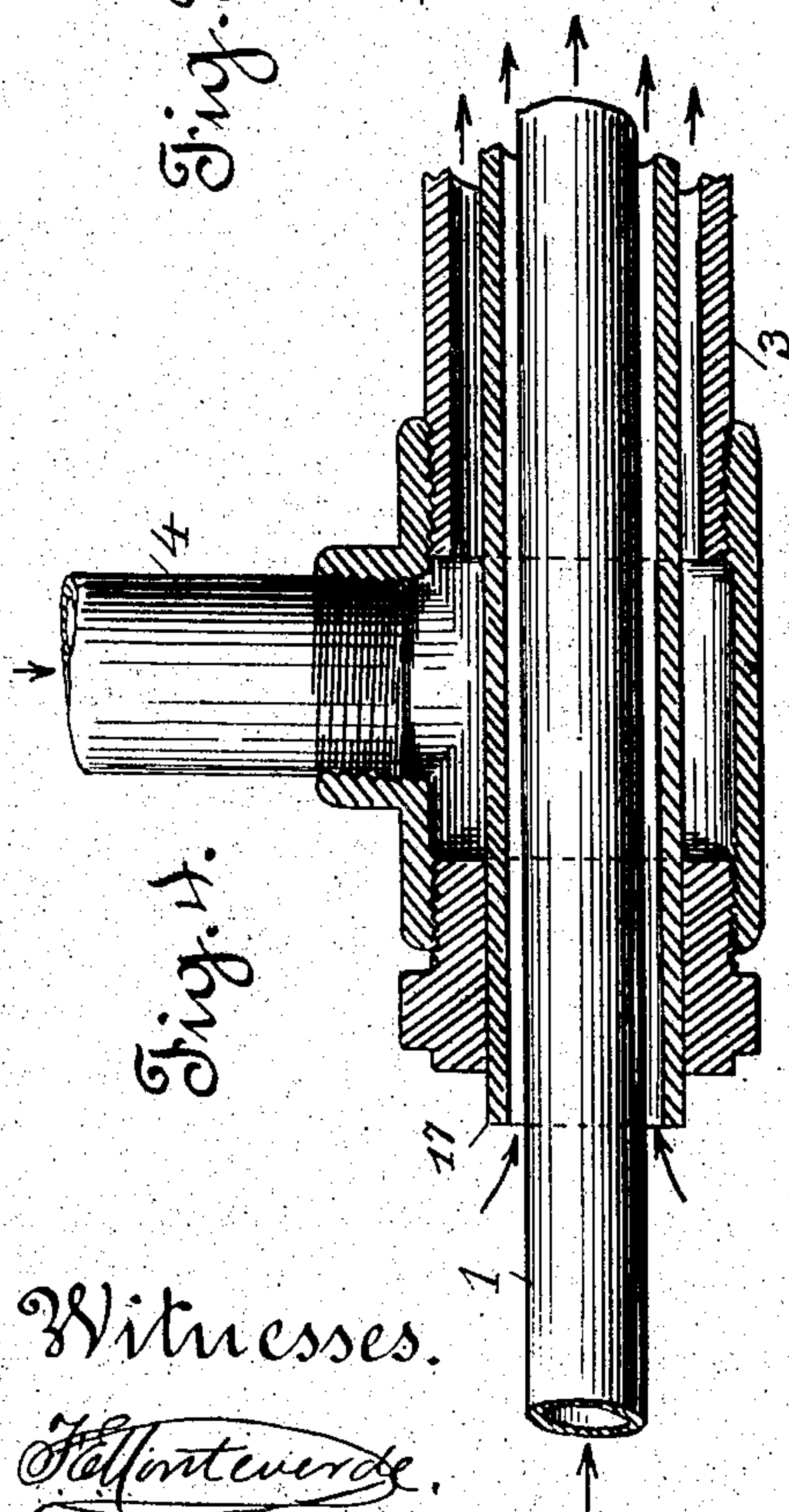


Fig. 4.

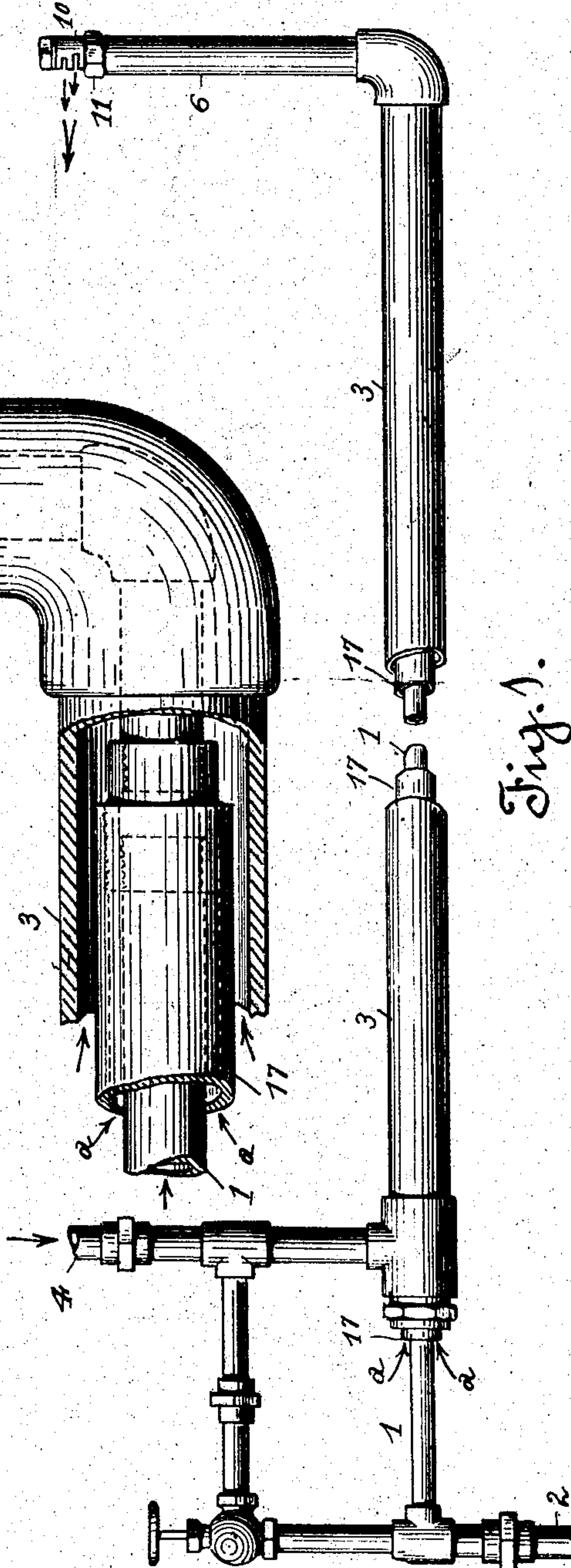


Fig. 1.

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UNITED STATES PATENT OFFICE.

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OIL OR HYDROCARBON BURNER.

No. 827,372.

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To all whom it may concern:

Be it known that we, ANDREW M. HUNT and THOMAS MIRK, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Oil or Hydrocarbon Burners; and we do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to an improved oil-burner designed for use in connection with marine furnaces or furnaces into which the burner is extended approximately the entire depth in order that the hydrocarbon may be discharged outwardly or into the combustion-chamber from the rear portion of the furnace, thereby obtaining a more uniform distribution of the heat within the furnace, the invention residing more particularly in the construction of the nozzle of the burner and in the arrangement whereby the oil-pipe is maintained air-jacketed.

To comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a broken side view of the burner, Fig. 2 is an enlarged detail broken view of the inner end portion thereof, the steam-pipe being partly sectioned. Fig. 3 is an enlarged vertical sectional view of the nozzle portion of the burner, and Fig. 4 is an enlarged broken view disclosing the steam-pipe and the air-jacket in longitudinal section.

The numeral 1 is used to indicate the oil-pipe, which connects with the oil-supply connection 2. This pipe is arranged within the steam-pipe 3, connected to the supply-pipe 4, the oil-pipe and the steam-pipe comprising the body of the burner. At its inner end the oil-pipe is attached to the upwardly-extending discharge-tip 5, arranged within the upwardly-extending portion 6 of the steam-pipe 3. The oil-discharge tip 5 gradually tapers toward its upper end and is provided with a series of outlet-openings 7, formed through its wall at substantially right angles to its vertical axis. Said tip is formed with a shoulder 8, which bears onto a centrally-perforated diaphragm 9 of the thimble 10, which surrounds the projecting end of the discharge-tip 5. This thimble is connected to the upper end of the upwardly-projecting extension 6

of the steam-pipe by means of the coupling-ring 11, the circular flange 12 of which engages with the shoulder 13 of the thimble 10. The outer end of the said thimble is closed by the head or cap 14, into which fits the end of the discharge-tip 5. However, this is immaterial.

The diaphragm 9 when the parts are properly positioned divides the interior of the thimble into an upper chamber 15 and a lower chamber 16, the former of which receives the oil discharged from the oil-tip 5 and the latter receiving the steam from the extension 6. The oil and steam thus received into the thimble 10 escape therefrom by reason of the supply-pressure through the escape-slots 15' and 16', cut through the wall of the said thimble above and below the diaphragm 9, respectively, at right angles to the line of travel of the steam and oil. As the oil and steam are thus ejected the jets intermingle a short distance beyond the burner's nozzle.

Inasmuch as burners of this character extend the entire length of the furnace, the tendency of the oil-pipe is to become too heated. This causes the oil to volatilize and form gas at the inner portion of the burner, which exerts a back pressure onto the oil at the forward end of the burner and prevents a uniform discharge of the hydrocarbon into the combustion-chamber of the furnace. To avoid this, it is required that the temperature of the oil-pipe be reduced or checked, which is accomplished by inclosing the same within the pipe or shell 17, which at one end at least is open to the atmosphere. Air is thus permitted to enter at the outer end, as indicated by arrows *a*, thus air-jacketing the oil-pipe. By this means the temperature of the oil-pipe is maintained substantially uniform.

The oil-tip 5, steam-pipe extension 6, and thimble 10, with its dividing-diaphragm 9, constitute the nozzle for the burner. Inasmuch as the parts are separable, ready access may be had to the interior thereof for cleaning or repair purposes.

It will be observed that the upper face of the transverse slot 16' is made at an outward inclination, the purpose of which is to direct the jet of steam issuing therefrom slightly

upward, so as to strike into the jet of oil issuing at right angles to the vertical axis of the nozzle.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. In an oil-burner, an oil-feed pipe and a steam-feed pipe arranged concentrically with an air-space between them, said air-space being closed at the discharge end of the burner and open at the opposite end.

2. An oil-burner provided with a discharge - nozzle arranged at an angle to its body portion, said nozzle comprising an oil-discharge tip, a thimble surrounding the tip, a diaphragm within the thimble and integral therewith, a shoulder on the tip onto which the diaphragm seats, means for uniting the thimble to an extension of the burner's body, transverse outlet-openings in the thimble for the escape of oil and steam, said openings being arranged above and below the diaphragm, and radial outlets in the discharge-tip for the oil.

3. An oil-burner having its discharge-tip inclosed by a thimble provided with an integral diaphragm arranged intermediate its ends through which the discharge - tip extends, a shoulder on the said tip which seats against the diaphragm, a series of outlet-openings in the discharge-tip, and transverse outlets for the escape of oil and steam from

within the thimble, said outlets being respectively above and below the interior diaphragm.

4. An oil-burner nozzle comprising an oil-discharge tip, a detachable thimble covering the same and having an integral diaphragm through which the tip extends, a shoulder on said tip against which the diaphragm seats to divide the interior of the thimble into a steam-chamber and an oil-chamber, outlets in the upper portion of the oil-discharge tip, and transverse outlets formed in the thimble above and below the internal diaphragm.

5. An oil-burner having its discharge-tip inclosed by a thimble provided with a diaphragm secured to and projecting from the interior surface of the thimble intermediate its ends, through which the discharge-tip extends, a shoulder on said tip adapted to rest upon the diaphragm, a series of outlet-openings in the discharge-tip and transverse outlets for the escape of oil and steam from within the thimble, said outlets being respectively above and below the interior diaphragm.

In witness whereof we have hereunto set our hands.

ANDREW M. HUNT.
THO. MIRK.

Witnesses:

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FRED. WILSON.