

No. 632,494.

Patented Sept. 5, 1899.

A. KITSON.
VAPOR BURNING APPARATUS.

(Application filed Jan. 16, 1899.)

(No Model.)

2 Sheets—Sheet 1.

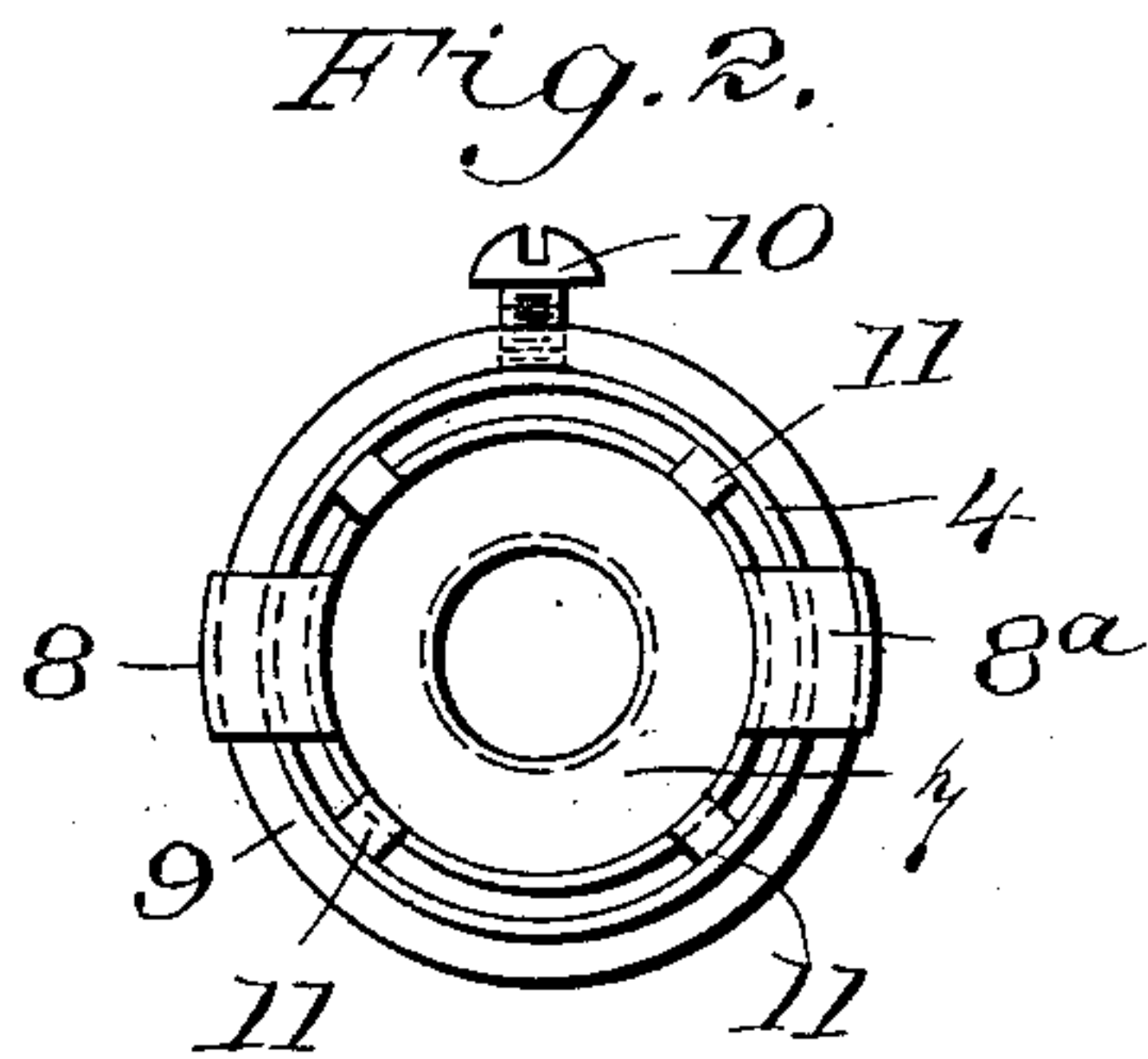
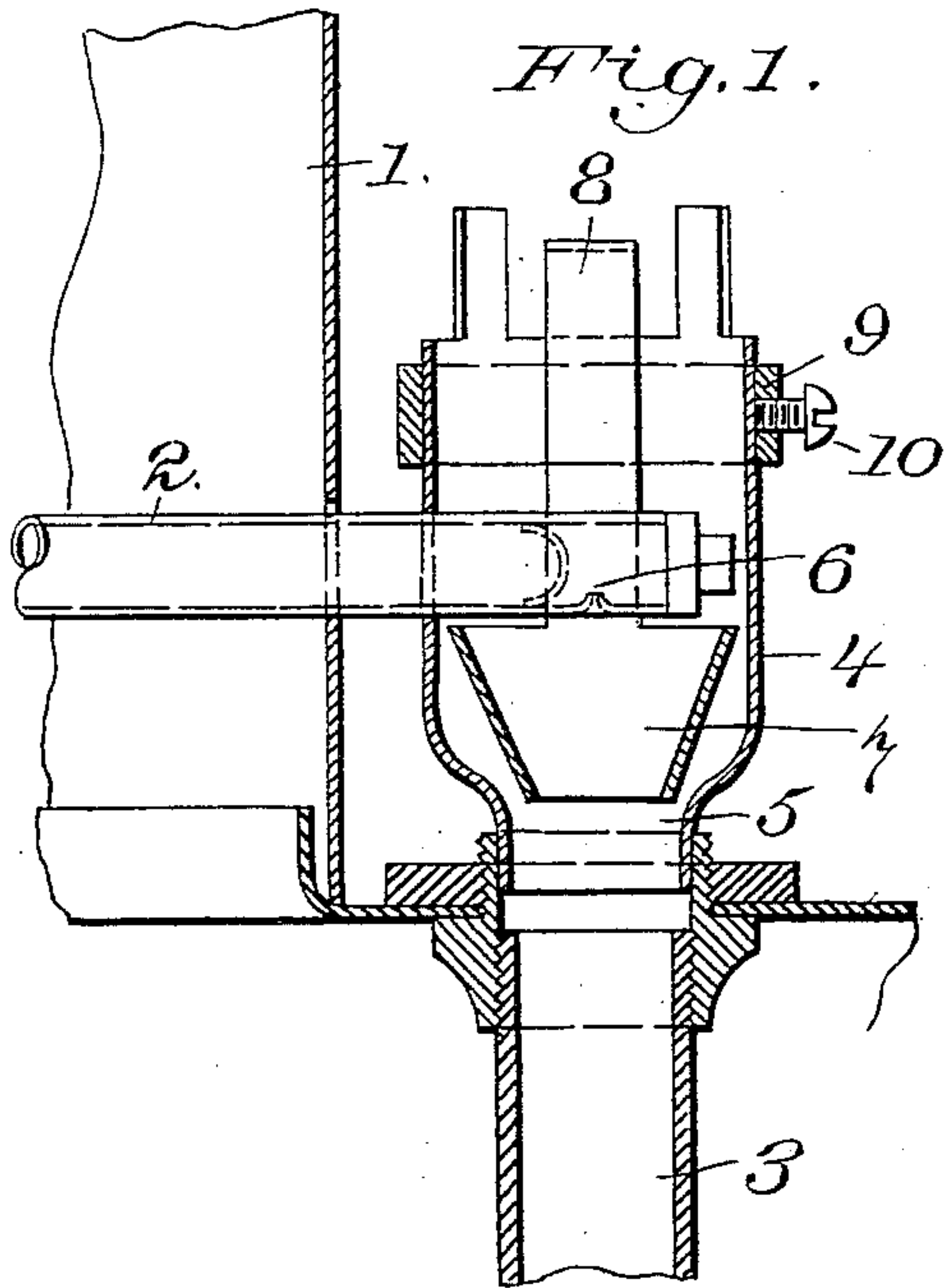


Fig. 3.

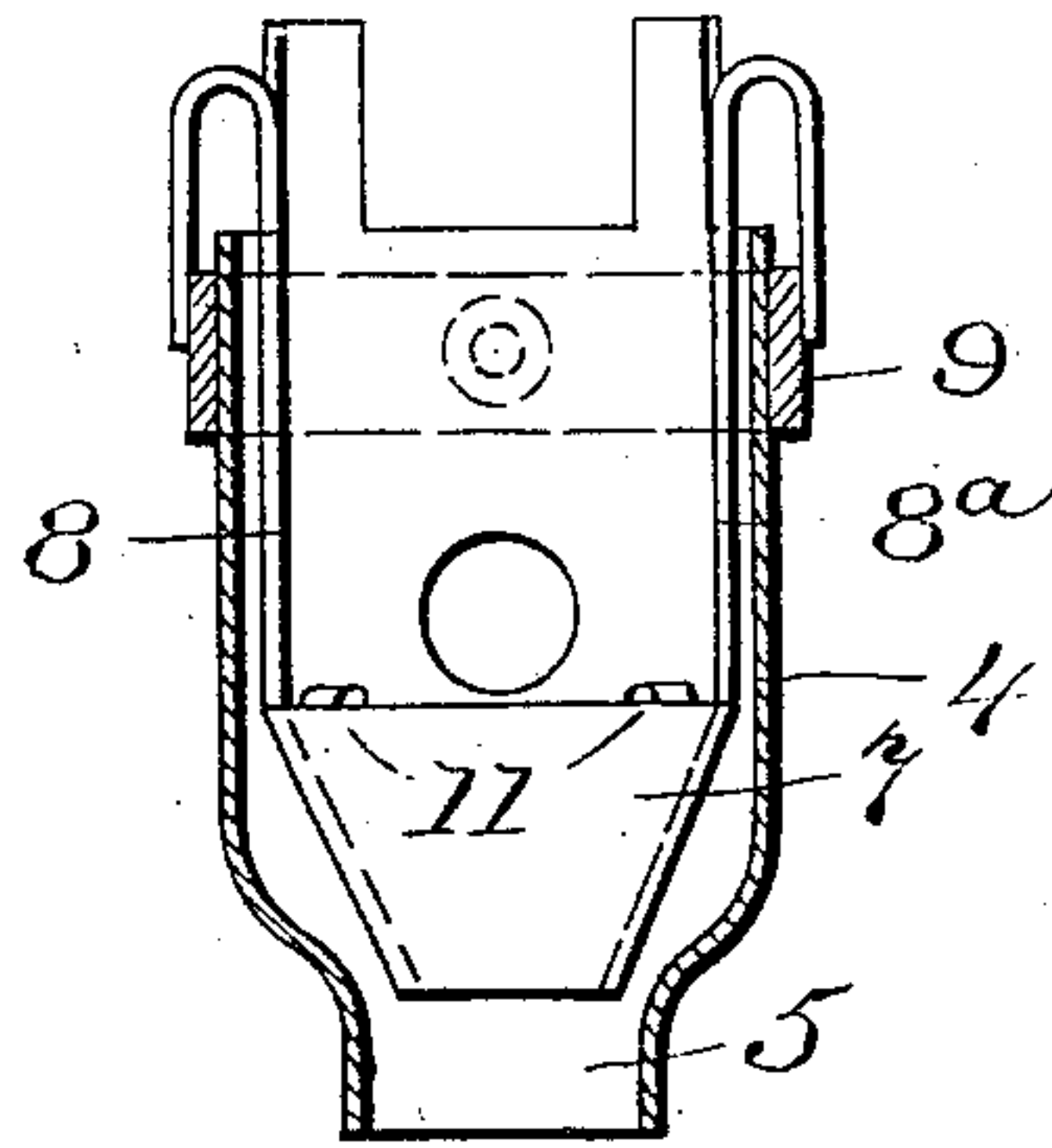
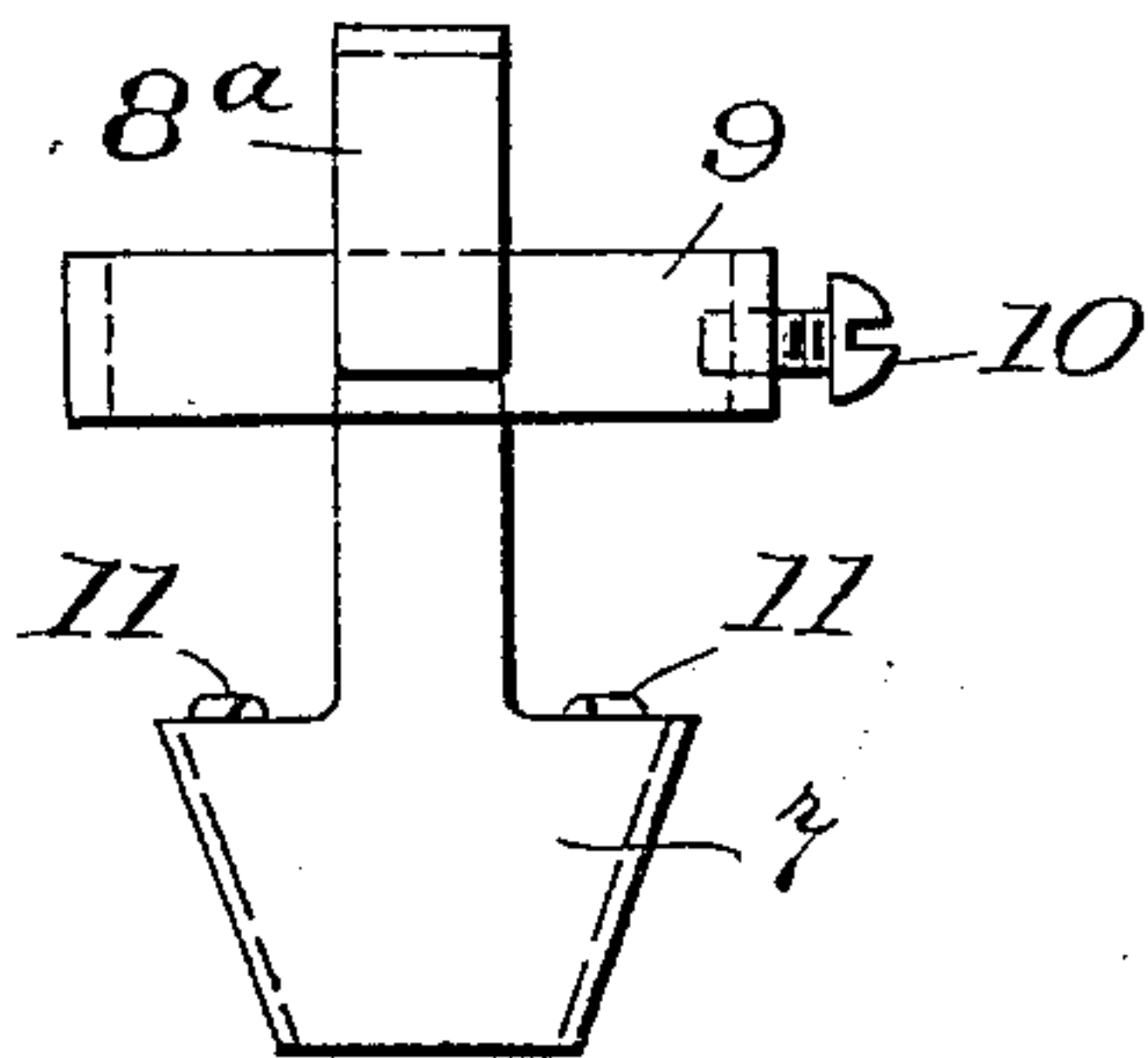


Fig. 4.



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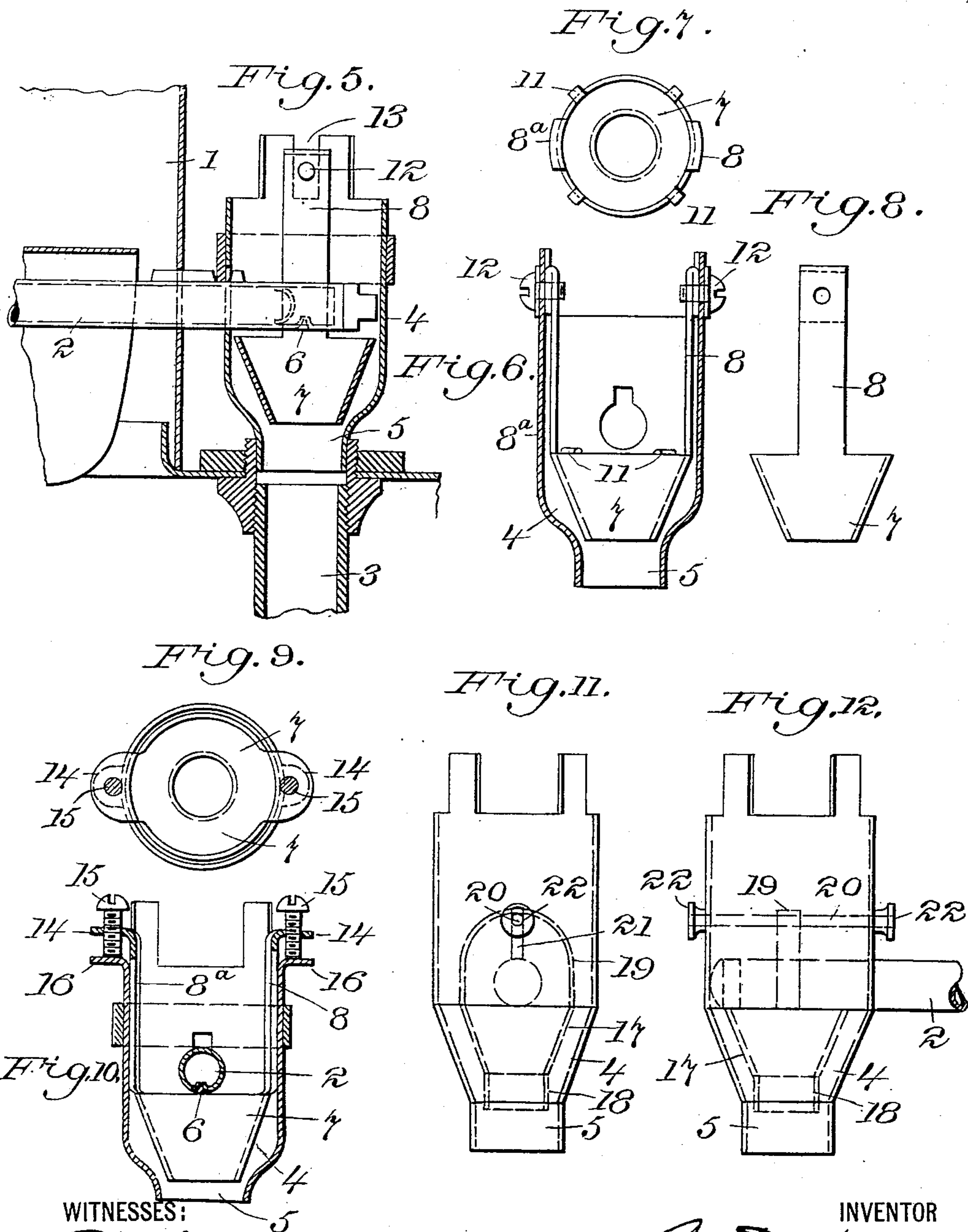
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

ARTHUR KITSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
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VAPOR-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 632,494, dated September 5, 1899.

Application filed January 16, 1899. Serial No. 702,217. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR KITSON, a sub-
ject of the Queen of Great Britain, and a resi-
dent of Philadelphia, county of Philadelphia,
5 State of Pennsylvania, have invented certain
new and useful Improvements in Vapor-Burn-
ing Apparatus, of which the following is a
specification.

My invention relates to vapor-burning appa-
10 ratus; and it more specifically consists of im-
proved means for producing the most efficient
action of the jet of vapor in drawing in the
necessary amount of air to the mixing-tube
and delivering the combustible mixture so
15 formed to the vapor-burner. I find that slight
variations in the adjustment of the jet in the
matter of its distance from the neck of the
mixing-tube, &c., will make a great differ-
ence in the efficiency of the light produced,
20 and I have designed the various forms of ad-
justable cone-nozzle herein described and
shown to most readily produce the necessary
adjustment to secure the highest degree of
efficiency.

25 The preferred form of my apparatus, with
various slight modifications in details, is
shown in the accompanying two sheets of
drawings, in which—

Figure 1 is a sectional detail view of a part
30 of the vapor-burning apparatus with the ad-
justable cone in position. Fig. 2 is a plan
view of the mouth of the mixing-tube. Fig.
3 is a detail section of the mouth of the mix-
ing-tube with the cone in position. Fig. 4 is
35 a detail view of the cone-nozzle with attached
ring. Fig. 5 is a similar view to Fig. 1, show-
ing one modified construction. Fig. 6 is a
section at right angles to Fig. 5 with the vap-
orizing-tube removed. Figs. 7 and 8 are de-
40 tails of the cone-nozzle shown in Figs. 5 and
6. Figs. 9 and 10 show another modified
form. Figs. 11 and 12 show a still further
modification.

Throughout the drawings like reference-
45 figures refer to like parts.

1 represents a portion of the chimney or
other part of the lamp-frame.

2 is a vaporizing-tube; 3, the mixing-tube,
having the enlarged mouth 4, with throat 5,
50 of smaller cross-section.

6 is the discharge-opening in the vaporiz-
ing-tube. In front of the discharge-opening
I arrange an adjustable cone 7, whose smaller
end is approximately equal in cross-section
to the throat of the mixing-tube. This cone 55
may be mounted in various ways to secure its
adjustment to and from the vaporizing-tube,
so as to locate it in the position for producing
the most efficient action.

In the construction shown in Figs. 1, 2, 3, 60
and 4 the cone 7 has extensions 8 and 8^a, which
are bent over and brazed or otherwise fas-
tened to a ring 9, which is held in any de-
sired position on the mouth of the mixing-
tube by the set-screw 10. 11 11, &c., are 65
little lugs projecting in order to insure the
centering of the injector-cone in the mouth
of the mixing-tube.

In the modification shown in Figs. 5, 6, 7,
and 8 the adjustment of the cone is secured 70
by having set-screws 12 12 pass directly
through slots 13 13 in the mouth of the mix-
ing-tube and screwed into the extensions 8 8^a
from the injector-cone.

In the modification shown in Figs. 9 and 10 75
the extensions 8 8^a of the cone are bent out
at right angles, as shown at 14 14. The set-
screws 15 15 pass through these bent-over
portions and bear on the lugs 16 16, formed
by bending out portions of the metal on the 80
mixing-tube mouth.

In the construction shown in Figs. 11 and
12 a slightly-different form of cone 17 is
shown, having a cylindrical extension 18.
This cone has a hoop-shaped extension 19, 85
which is welded or otherwise fastened to a
cross-bar 20, which passes through slots 21 21
in the mouth of the mixing-tube and can be
held in any desired position by means of the
thumb-nuts 22 22. 90

In all these various constructions the vap-
orizing-tube is held in fixed relation to the
mixing-tube, so far as the distance of the dis-
charge-opening from the mouth of the mix-
ing-tube is concerned, while the lamp parts 95
are assembled for operation. The vaporizing-
tube can of course be withdrawn for cleaning
and replacement; but its position relative to
the mixing-tube cannot be changed during
the operation of the lamp. 100

The mode of operating my invention is clear from the foregoing description.

By loosening the set-screws 10 or 12 the cone 7 may be raised or lowered until it reaches a position which produces the best result in any particular lamp. The same result will be obtained in the construction shown in Figs. 9 and 10 by turning the adjusting-screws 15 15 to right or left. In the construction shown in Figs. 11 and 12 the thumb-nuts 22 22 are loosened and the cross-bar 20 lifted up or down until the proper position is secured, when the thumb-nuts are screwed down to hold the cone 17 in that position. In the construction shown in Figs. 9 and 10 the extensions 8 8^a are bent outward slightly, so as to guide the cone-nozzle and center it in the mouth of the mixing-tube.

It is evident that various changes could be made in the details of the apparatus described without departing from the spirit and scope of my invention so long as equivalent means for adjusting the cone-nozzle are employed.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a vapor-burning apparatus the combination of the mixing-tube, the vaporizing-tube discharging into the mixing-tube and in fixed relation thereto, and an adjustable cone located within the mouth of the mixing-tube and in the line of discharge from the vaporizing-tube, substantially as described.

2. In a vapor-burning apparatus the combination of the mixing-tube having an enlarged mouth, the vaporizing-tube discharging into the mouth of the mixing-tube and in fixed relation thereto, the movable cone-nozzle whose smaller end is approximately equal in cross-section to the throat of the mixing-tube and which is located within the said enlarged mouth of said mixing-tube, and means for adjusting said cone-nozzle in various po-

sitions between the discharge-opening of the vaporizing-tube and the throat of the mixing-tube, substantially as described.

3. In a vapor-burning apparatus the combination of the mixing-tube having an enlarged mouth, the vaporizing-tube discharging into the mouth of the mixing-tube and in fixed relation thereto, the movable cone-nozzle whose smaller end is approximately equal in cross-section to the throat of the mixing-tube and which is located within the said enlarged mouth of said mixing-tube, and adjusting-screws by which said cone-nozzle may be held at varying distances from the throat of the mixing-tube, substantially as described.

4. In a vapor-burning apparatus the combination of the mixing-tube having an enlarged mouth, the vaporizing-tube discharging into the mouth of the mixing-tube and in fixed relation thereto, the movable cone-nozzle whose smaller end is approximately equal in cross-section to the throat of the mixing-tube, the collar which surrounds the mouth of the mixing-tube, the set-screw which holds the collar to the mixing-tube mouth, and projections from the rear of said cone-nozzle which are bent over and attached to said adjustable collar, substantially as described.

5. In a vapor-burning apparatus the combination of the mixing-tube, the vaporizing-tube discharging into the mixing-tube and in fixed relation thereto, an adjustable cone located within the mouth of the mixing-tube and in the line of discharge from the vaporizing-tube, and means for centering said cone in the mouth of the mixing-tube, substantially as described.

Signed by me at New York, N. Y., this 7th day of January, 1899.

ARTHUR KITSON.

Witnesses:

LILIAN FOSTER,
A. PARKER-SMITH.