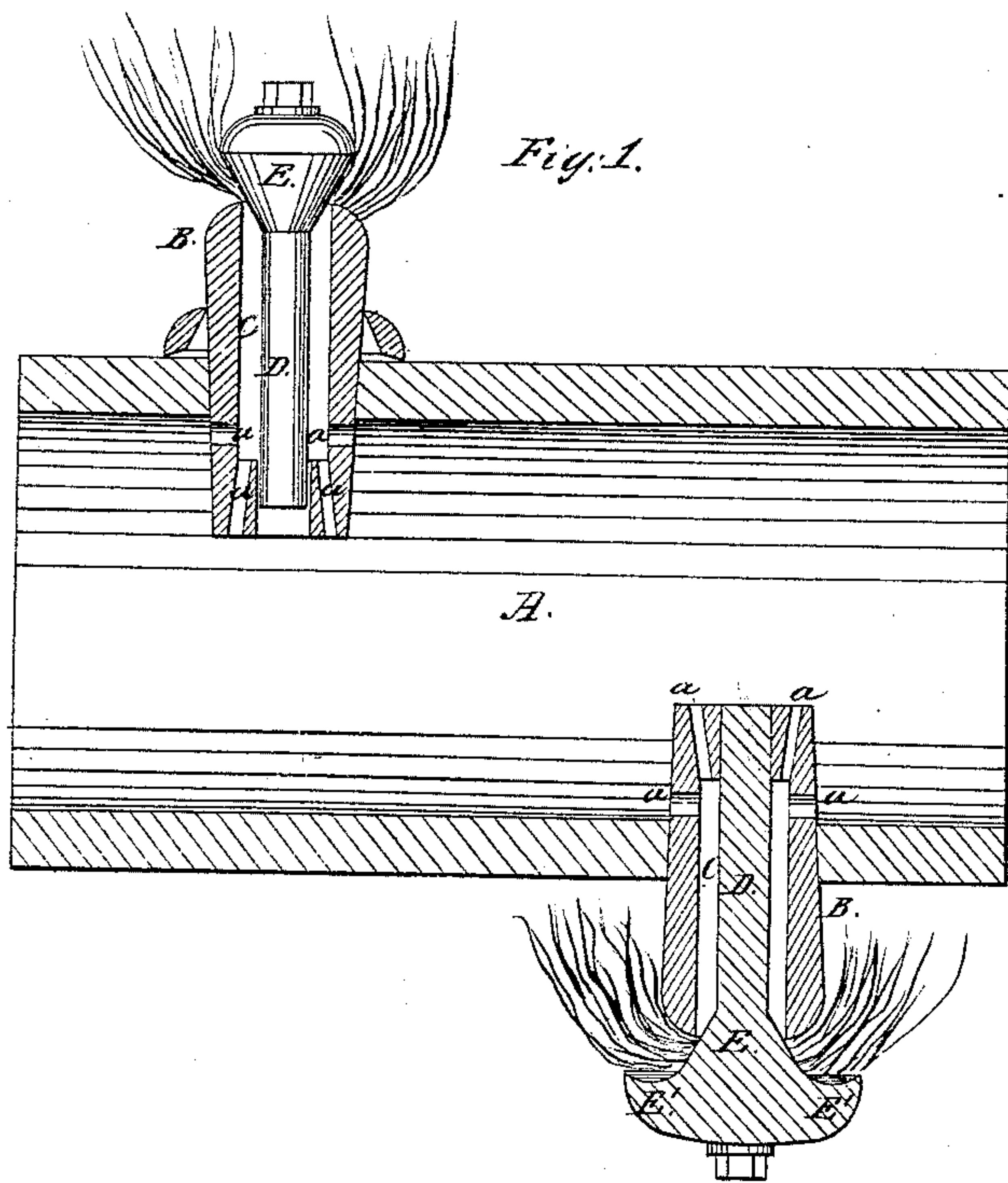
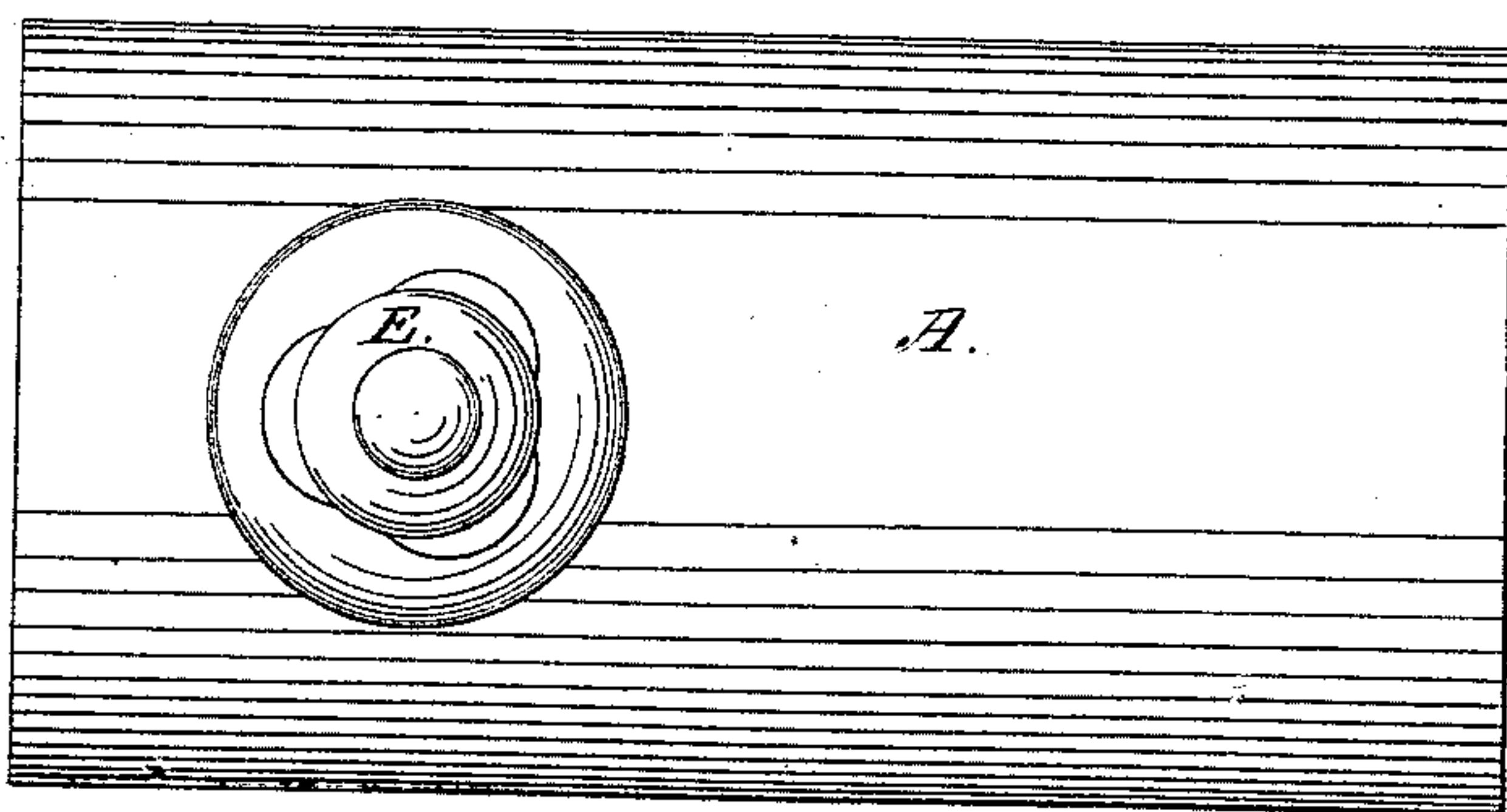


*J. Gray,*  
*Burning Hydrocarbon.*  
*N<sup>o</sup> 84,110.                      Patented Nov. 17, 1868.*



*Fig. 2.*



*Witnesses:*  
*Geo. H. Strong*  
*J. L. Boone*

*Inventor:*  
*John Gray*  
*By his attys Dewey & Co*

# United States Patent Office.

JOHN GRAY, OF SAN FRANCISCO, CALIFORNIA.

*Letters Patent No. 84,110, dated November 17, 1868.*

## IMPROVEMENT IN HYDROCARBON-BURNERS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, JOHN GRAY, of the city and county of San Francisco, State of California, have invented an Improved Petroleum-Burner; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvement without further invention or experiment.

The nature of my invention is the construction of an improved petroleum-burner, to be employed more especially in that class of apparatus where steam is generated by the use of crude or refined petroleum; and it consists in a conical plug or button, around which the inflammable gas escapes from the retort, and is spread so as to make a large heating-surface. This plug is set into a cylindrical vessel or tube, and is attached to it by means of a stem extending through it, and of a smaller diameter than the inside of the tube, to allow a free passage for the vapor on all sides.

Openings are made in the tube of such a form as to allow the vapor from the retort to enter it. The cone or plug is so constructed that it may be moved up and down to regulate the size of the passage, and thereby the size and extent of the flame.

To more fully explain my invention, reference is had to the accompanying drawings, forming a part of this specification, of which—

Figure 1 is a side sectional elevation.

Figure 2 is a top view, showing one burner.

Similar letters of reference indicate like parts in each of the drawings.

A is a section of the vessel or retort, into which the oil is received and vaporized or rendered fit to be burned.

B B are two tubes or cylinders, of which there may be any number in the retort, and which are either made tapering and driven in, or fastened in any other suitable way.

An opening, C, extends to near the bottom of the cylinder, where it is contracted to such a size as to hold the stem D of the spreading-cone E.

Two or more openings, *a a*, are formed at each side of the stem, which serve to admit the vapor to the space C, around the stem, and by which also all deposits of tar or thick residual matter may be easily removed, so that the burner will never become clogged or choked.

In the upper burner, shown in these drawings, the cone E is so formed that the vapor striking it, as it rushes out, will be deflected on all sides so as to cover a great surface.

The lower burner is so formed that the cap or button E' is partly bent or turned on itself, so that the jet of vapor is returned and brought to act on the lower part of the retort, thus keeping it hot for a perfect vaporization of the oil.

The cones are connected to the cylinders B, by means of the stems D, in such a manner that they can be raised and lowered, so as to give any space for the egress of vapor that may be desired, thus giving a burner which may be easily kept clean, and instantly regulated, as more or less heat is required.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

The above-described adjustable burner, consisting of the cylinder B, plug E, adjusting-stem D, and openings *a a*, constructed and arranged substantially as described.

In witness whereof, I have hereunto set my hand and seal.

JOHN GRAY. [L. S.]

Witnesses:

J. L. BOONE,

C. W. M. SMITH.