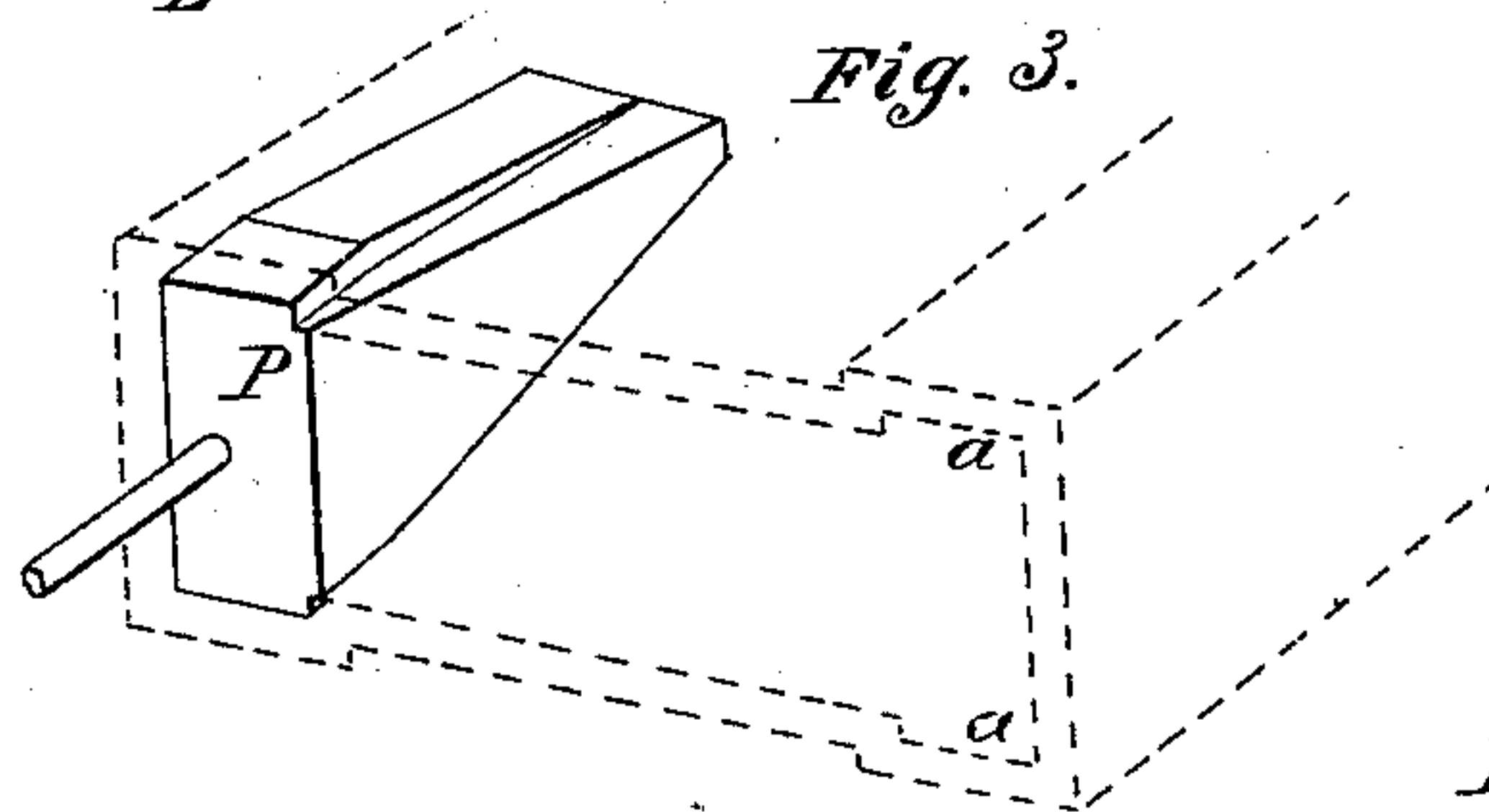
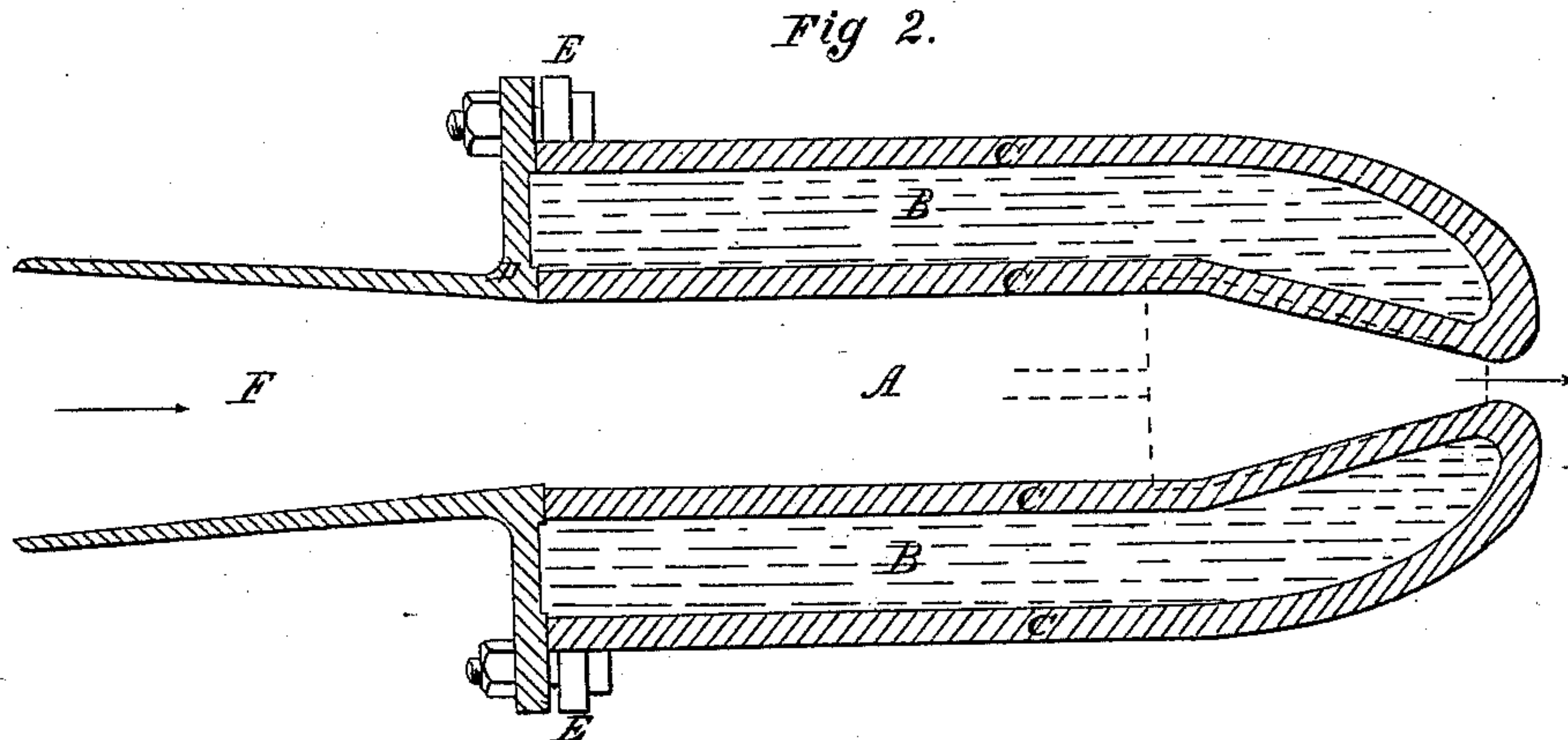
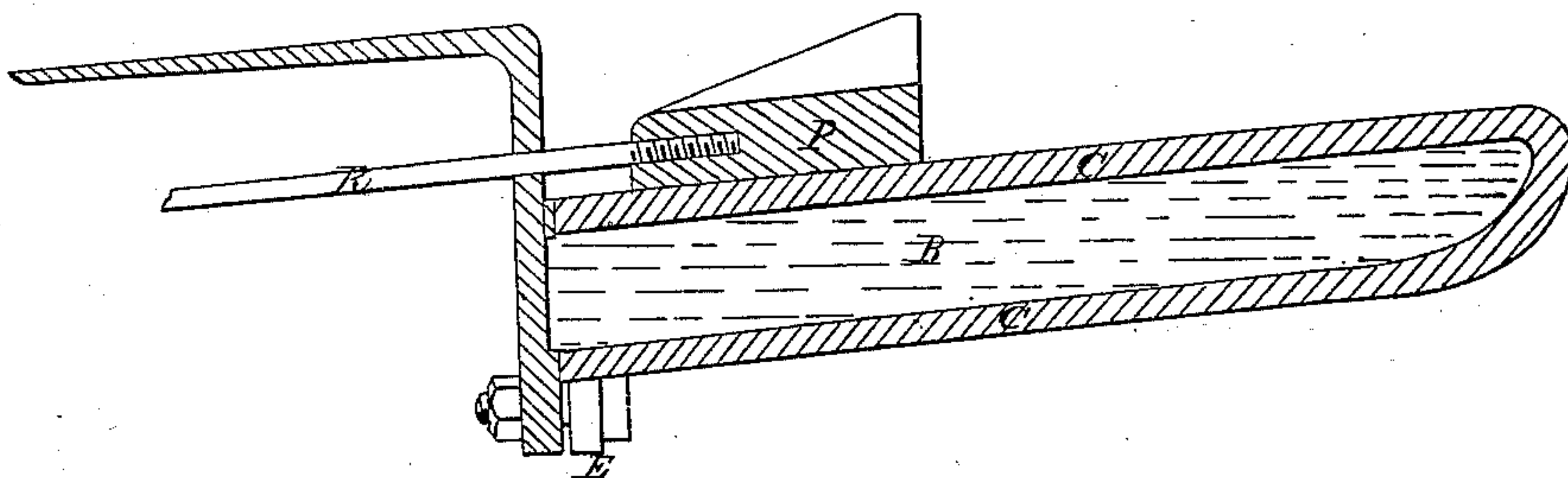
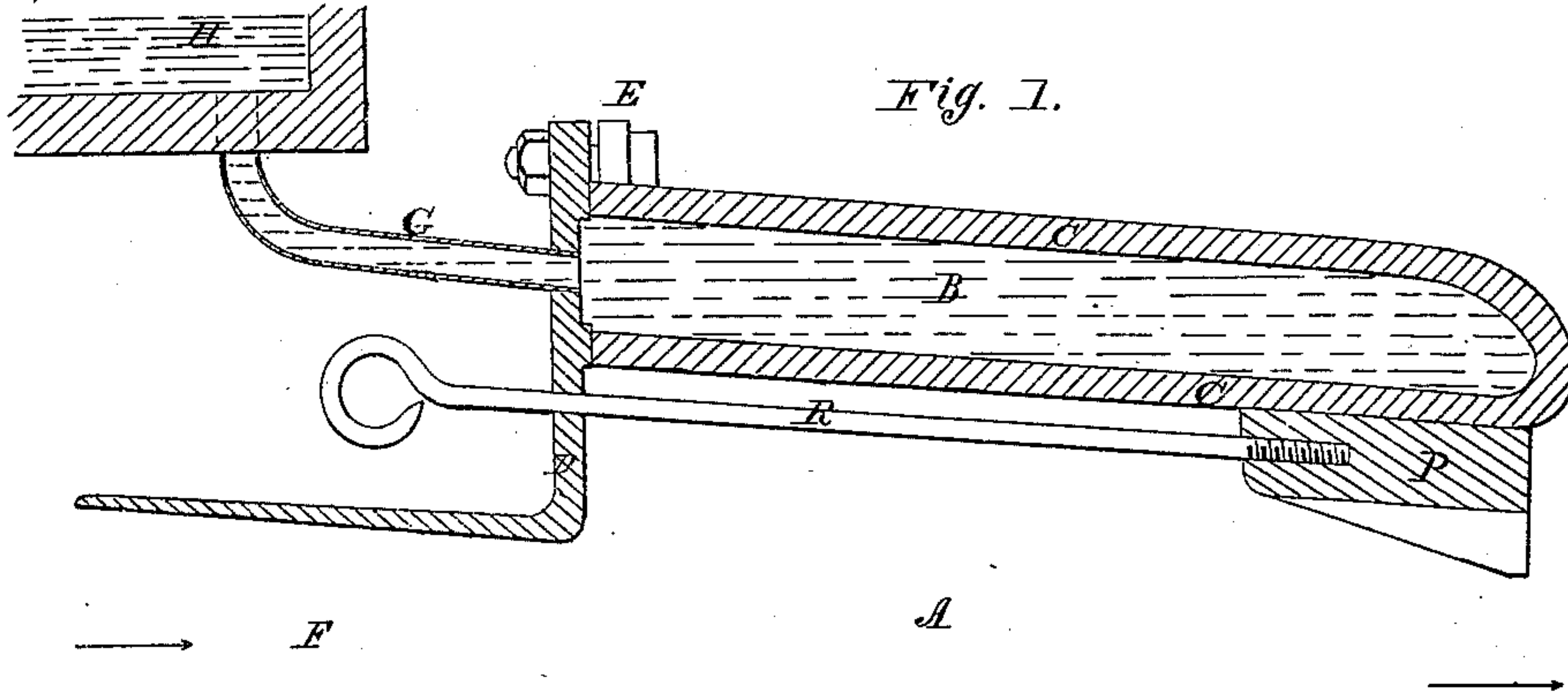


B. E. Dixon,

Tuyere,

N^o 22,111.

Patented Nov. 23, 1858.



Witnesses:

Guy Johnson.
Martin Strong

Inventor:

B. E. Dixon

UNITED STATES PATENT OFFICE.

BENJAMIN E. DIXON, OF MARSHALL, MICHIGAN.

IMPROVED BLACKSMITH'S TUYERE.

Specification forming part of Letters Patent No. **22,111**, dated November 23, 1858.

To all whom it may concern:

Be it known that I, BENJAMIN E. DIXON, of the town of Marshall, in the county of Calhoun and State of Michigan, have invented a new and useful Improvement on Tuyeres for Blacksmiths' Use; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying and annexed drawings, making a part of this specification, in which—

Figure 1 is a longitudinal section taken horizontally through the center; Fig. 2, a longitudinal section vertically through the center; Fig. 3, a detached perspective view of a throttle-plug and end section of wind-chamber.

The same letters refer in all the figures to similar parts.

This improvement consists of a device for regulating the width of the nozzle at the point of exit in tuyeres when surrounded by water.

This tuyere is of cast-iron, excepting the rods and bolts, and the drawings exhibit it at about half size for common use.

A A is the wind-chamber, and B B B B the water-space, which entirely surrounds the inner and outer metal casings, (represented at C C C C, &c.,) said chamber and space being cored out of one single casting, open at the back end. The corner angles of the outer casing are arched at the sides and fire end to strengthen the casting and facilitate the removal of scale. The sides of the inner and outer casings, as seen in Fig. 1, which is a top view, diminish in width toward the exit-passage, while the upper and lower casings, as in Fig. 2, which shows edgewise, lie parallel for some distance, when the outer plates arch toward the nozzle and the inner ones contract by a straight angle toward the center of the wind-chamber, forming a longish narrow opening for the passage of the wind into the fire.

D D is a cover bolted to the lugs E E and closing up the back end water-tight. The wind enters the chamber A through the pipe F, which is cast on the cover, and into which the bellows-nozzle or other wind-tube is inserted.

G is a small pipe which supplies water from a tank, of which H is a corner section. There is another small pipe leading to the upper water-space (not seen) for the escape of steam into the upper part of the tank.

P P are two throttle-plugs which regulate the length of the exit wind-passage. They are made to slide back and forth in grooves cast in the upper and lower plates of the inside casing inside the wind-chamber, as indicated by the dotted lines at *a* in Fig. 3, by means of the rods R R, passing through the cover D. These plugs are cast with tongues on their edges to confine them in the grooves, and are tapered on three sides, two being chamfered to fit and close up air-tight (see dotted lines in Fig. 2) the wedge-shaped space at the termination of the wind-chamber, and the other or inner side being tapered in a reverse direction toward the butt, where the rods are tapped into them. When the plugs are pushed quite up, an opening is left through the middle of the slot just sufficiently large for the lightest kind of work—such as horse-shoe-nails, &c. When one of them is withdrawn, as seen in Fig. 1, a still broader fire is produced; but when one is drawn entirely back and the other partially, so that both plugs do not lie opposite, a free blast is obtained through the largest area of space for long and heavy heats.

That a ready way of altering the form, as well as increasing the areas of the exit wind passages or nozzles of tuyeres, is productive of great saving in the consumption of coal, where the work to be done is of a varied and different character, has long been sufficiently demonstrated. Many contrivances of this kind are objectionable, from the surfaces that are presented breaking up the force and changing the direction of the blast, which, instead of turning short angles, should always be straight and uninterrupted. Some are liable to choke up, while the intense heat to which they are subject renders in others the whole device inoperative.

This improvement, it is believed, will to a great extent remedy the defects enumerated at a diminished cost of construction. When the chamfered plugs are withdrawn from the nozzle into the wider space at the back of the wind-chamber, (in the manner directed for the largest heat,) the fullest area is preserved, while no obstruction by unfavorable angles is offered to the wind, which effectually clears the chamber of all "débris" and issues from the nozzle with unabated force. The plugs also being inside the wind-space, and abutting

against the end of the grooves, are protected from any destructive action of the fire.

I do not claim the mode of protecting a tuyere by the introduction of water, (for that has long been known and used;) but,

Having described my improvement and shown its applicability to water-tuyeres, what I claim as new, and desire to secure by Letters Patent, is—

The mode of regulating the length of the discharging-orifice in a water-tuyere by means

of the oblong tapered wind-chamber A, (with grooves or other equivalent device in its casing,) in combination with one or more of the tapered plugs P P, rods R R, and the detachable cover D, to be used for the purposes and in the manner substantially as is herein described and set forth.

B. E. DIXON.

Witnesses:

GEORGE JOHNSON,

MARTIN D. STRONG.