

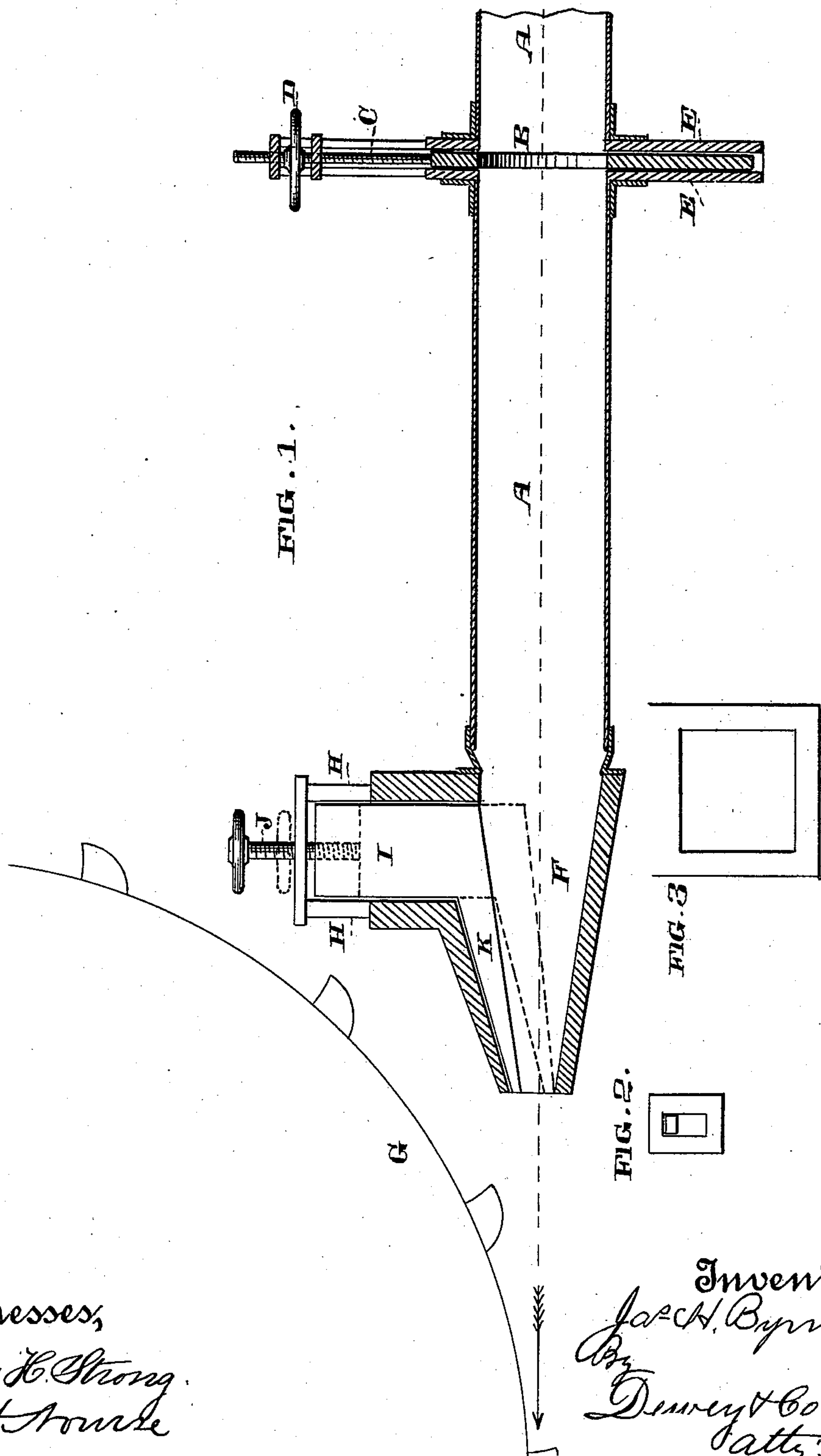
(No Model.)

J. H. BYRNE.

HYDRAULIC NOZZLE AND GATE.

No. 352,732.

Patented Nov. 16, 1886.



Witnesses,
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UNITED STATES PATENT OFFICE.

JAMES H. BYRNE, OF NEVADA CITY, CALIFORNIA, ASSIGNOR OF ONE-HALF
TO HENRY S. WELCH, OF SAME PLACE.

HYDRAULIC-NOZZLE AND GATE.

SPECIFICATION forming part of Letters Patent No. 352,732, dated November 16, 1886.

Application filed November 23, 1885. Serial No. 183,781. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BYRNE, of Nevada City, Nevada county, State of California, have invented an Improvement in Hydraulic Nozzles and Gates; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to hydraulic nozzles and gates, which are especially adapted for use in connection with that class of wheels which are driven by a jet or stream of water delivered into the buckets of the wheel through a nozzle connected with the pipe which brings the water from a high elevation, so as to give it great momentum. The pressure of the water is so great that it has hitherto been impracticable to regulate and alter the size of the jet without so altering the shape of the delivery-nozzle as to greatly impair its efficiency.

My invention consists in the peculiar construction and combination of devices, which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a longitudinal vertical section of the nozzle. Fig. 2 is a front view of the nozzle. Fig. 3 is a rear view of the nozzle.

A is the pipe through which water is brought to the nozzle from a reservoir or source of supply, so situated as to produce an enormous pressure. In this pipe, a short distance from the nozzle, is fitted a transversely-sliding gate, B, which is provided with a screw-shank or stem, C, and an operating-nut and hand-wheel, D. A hole is made through the gate, of equal size with the interior of the pipe, and the gate itself extends downward below the pipe, sliding within the seat or case E, which serves as a guide for it, and which may be left open at the lower end. This extension of the lower part of the gate is of such a length as to more than equal the diameter of the pipe, and when the gate is drawn upward, the opening through it passing into the upper part of the case, the lower portion of the gate will be drawn across the pipe, thus cutting off as much of the water-supply as may be desired, and when it has been drawn across the pipe,

so as to entirely cut off the water, the lower edge of the slide remains within the case or seat E. This is important, because it prevents the settling of dirt or sediment within the case, which would eventually fill it up and prevent the gate being moved into it.

F is the discharge-nozzle, which may be made of any suitable or desirable shape. In the present case I have shown it as being of rectangular form and suitably tapered or contracted, so as to discharge a smooth and solid stream from its outer end into the buckets of the wheel G. From the upper rear part of the nozzle a vertical guide, H, extends at right angles with it, and within this guide a slotted slide, I, is fitted to move, this slide having a width or thickness equal to the width of this nozzle at that point. The upper end of the slide is connected with a screw-shank, J, passing through a fixed nut and having a hand-wheel, by which it may be turned so as to raise or lower the slide.

From the foot of the slide I, and forming a part of it, an extension, K, is formed, exactly fitting the interior of the nozzle and extending to the front or discharge end. The lower part of this extension forms the top of the nozzle, and it will be seen that when the slide I is moved downward in its guide H, this extension K is also carried downward, its sides fitting closely against the sides of the nozzle, which space it gradually closes to any extent which may be desired. In thus closing the nozzle the shape is maintained exactly the same, and the front end is always kept in proper form to deliver the diminished stream of water with the best effect. If desired, the entire jet of water may be cut off by this adjusting-nozzle without depending upon the gate.

This device is of great value in connection with the class of wheels to which it is applied, where it is often necessary to enlarge or diminish the stream of water.

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

A hydraulic discharge-nozzle made straight or rectangular in its interior dimensions, and

having one of its sides duplicated, the duplicate side being movable within the nozzle and in a parallel plane, so as to increase or diminish the inside area of the nozzle, in combination with a screw connected with the movable side, so as to move it in a parallel plane within the nozzle, substantially as and for the purpose herein specified.

In witness whereof I have hereunto set my hand.

JAMES H. BYRNE.

Witnesses:

GEO. H. STRONG,
S. H. NOURSE.