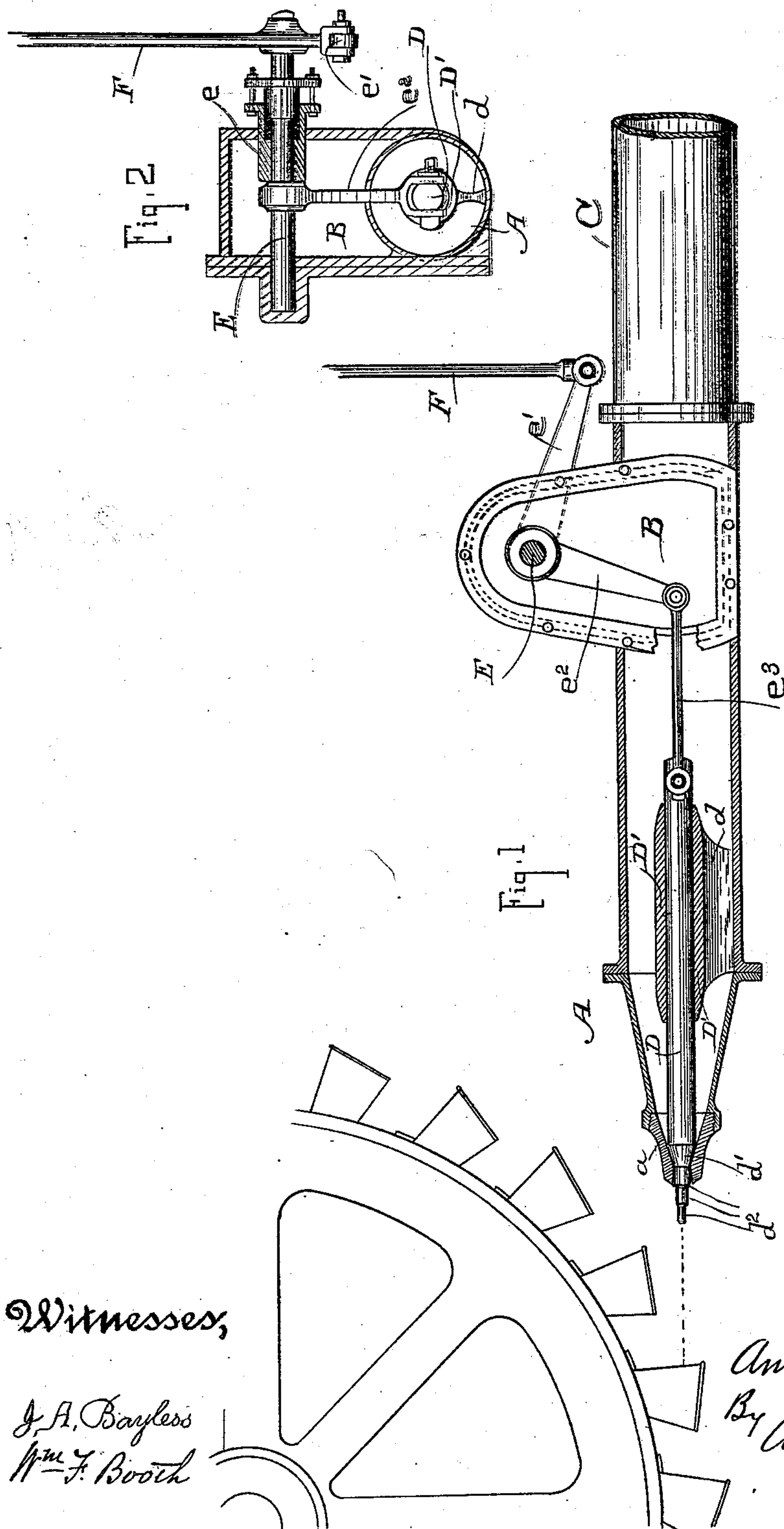


(No Model.)

A. CHAVANNE.
NOZZLE REGULATOR.

No. 543,228.

Patented July 23, 1895.



Witnesses,

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UNITED STATES PATENT OFFICE.

ANDRE CHAVANNE, OF GRASS VALLEY, CALIFORNIA.

NOZZLE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 543,228, dated July 23, 1895.

Application filed April 8, 1895. Serial No. 544,991. (No model.)

To all whom it may concern:

Be it known that I, ANDRE CHAVANNE, a citizen of the United States, residing at Grass Valley, Nevada county, State of California, have invented an Improvement in Nozzle-Regulators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of regulators especially adapted for use in water-nozzles which discharge a stream of water under pressure and in which a slidable plug within the nozzle and in the plane of its axis is adapted to be moved back and forth to vary the relation of its point or head with the forward end or tip of the nozzle in such a manner as to control the latter between the limits of entirely closing off the water and giving it full and clear exit.

My invention consists in the novel construction of the end or head of the plug, the manner in which it is mounted in the nozzle, and the means by which it is operated, all of which I shall hereinafter fully describe and specifically claim.

The object of my invention is to provide a simple and effective regulator for the nozzles of water-pipes, especially those which are adapted to discharge a stream of water under high pressure against a water-wheel or other source of power, and by means of said regulator to reduce or wholly avoid the loss of power arising from eddies, windings, or chokings of the stream under high pressure.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical longitudinal section through the nozzle and its water connections, showing my regulator in said nozzle and the means by which it is operated, and also showing a section of a power-wheel against which the stream of water is to be directed. Fig. 2 is a vertical section through the chamber or casing of the water connection, taken at right angles to the section of Fig. 1.

A is a nozzle of any suitable type or form having the usual conical tip a . B is a casing or chamber in communication with said nozzle, and C is the water connection from the source of water under head or pressure. Within the nozzle is fixed by an upright bracket d a guide sleeve D' , in which is seated and adapted to

slide back and forth the plug D, which lies and moves in the line of the axis of said nozzle. The forward end or head of this plug is made conical or tapering at d' and corresponds to the inclination or taper of the interior of the tip a , so that when pressed forward it will completely close said tip. Beyond this conical portion d' the head of the plug or valve extends, and said extension is best made in a series of reduced diameters (represented by d^2) and varying in number as may be desired. I have here shown, for example, three, joining one another by inclined shoulders, as shown.

The plug D, which forms the regulator, is moved back and forth by any suitable means; but those which I deem the best and which I have here shown are as follows: Within the casing or chamber B is a shaft E, suitably mounted therein and having one end extending outwardly through its side in a suitable stuffing-box e , whereby through a crank e' connected to its end the operating-rod or connection F may be attached. Within the casing or chamber B the shaft E has mounted upon it another crank-arm e^2 extending downwardly within the casing and having attached to its lower end the connecting rod e^3 , which joins it with the rear end of the slidable plug D. Now, by forcing the plug forwardly so that its conical portion d' fills the conical tip of the nozzle, said nozzle is completely closed and the discharge of water is entirely cut off. By moving the plug back to its innermost limit, in which the smallest of its reduced diameters lies within the extremity of the tip, said tip is opened to its fullest extent and the largest amount of water will pass through the nozzle. By moving the plug to points intermediate of these limits the amount of water discharged is varied correspondingly. The movement of the plug within the nozzle is a free and easy one, because it moves as readily in the water as it would in the open air, as it is wholly immersed therein, and its movement being gentle the change from one volume and force of water to another may be made gradually and without any shock.

With this regulator the stream at the outlet of the tip a emerges in a sinuous annular water-tube concentric with the head of the plug without losing any of its impulsive power.

With this device shocks, chokings, and

windings are avoided. There is no waste of water and the shutting off or the opening of a gate is unnecessary.

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

1. A nozzle regulator consisting of a nozzle having a conical tip a plug mounted within the nozzle and slidable in the line of the axis thereof said plug having a head corresponding to and adapted to fill, when projected, the conical exit of the nozzle or its tip, and having also an extension beyond said head, formed in portions of successively smaller diameters, whereby the issuing water is caused to assume an annular form concentric with the end of the plug, and its volume and force may be varied.

2. A nozzle regulator consisting of a nozzle having a conical tip, a plug slidable in the axis of the nozzle, and having a conical head conforming to and adapted to close, when projected, the conical tip of the nozzle, and having also an extension beyond said head formed in portions of successively smaller diameters, said portions joining each other by inclined or beveled shoulders.

3. A nozzle regulator consisting of a nozzle having a conical tip, a plug lying and adapted to be moved in the line of the axis of the nozzle, and having a head with a forward extension formed in portions of successively smaller diameters, adapted to control the nozzle exit, and the means for operating said plug consisting of an oscillating shaft having a crank arm connected with said plug and a second crank arm and an operating rod connected with said second crank arm.

4. In combination with the nozzle having a conical tip, the water casing or chamber and water connection, a regulator for said nozzle consisting of a plug slidable in the line of the axis of said nozzle and having a head formed in portions of successively smaller diameters, adapted to control its exit, an oscillating shaft mounted within the casing or chamber and extending through a suitable stuffing-box to

the outside, a crank arm on said shaft within the chamber or casing and having a connecting rod attaching it to the plug, a crank arm on the outer end of said shaft and an operating rod connected with said crank arm.

5. In combination with the nozzle having a conical tip, the water chamber or casing and water connection, a guide sleeve in the line of the axis of said nozzle, and lying within it, a plug mounted and adapted to slide in said guide sleeve and having a conical forward end with an extension therefrom formed in portions of successively smaller diameters adapted to control the nozzle tip, the oscillating shaft mounted within the casing or chamber and extending through a suitable stuffing-box to the outside, a crank arm on said shaft within the chamber or casing and having a connecting rod attaching it to the plug, a crank arm on the outer end of said shaft, and an operating rod or connection connected with said crank arm.

6. The water nozzle, the chamber or casing, and the water connection as described, in combination with a regulator for the nozzle consisting of a sleeve within said nozzle and in the line of its axis, a plug or valve adapted to slide in said sleeve and having a forward end or head with a conical portion, and an extension formed with portions of successively smaller diameters, said head or end being adapted to control the exit of the nozzle tip, the oscillating shaft within the chamber or casing of the nozzle and extending through a suitable stuffing-box to the outside, a crank arm on said shaft within the chamber or casing and having a connecting rod attaching it to the plug or valve, a crank arm on the outer end of said shaft, and an operating rod connected with said crank arm.

In witness whereof I have hereunto set my hand.

ANDRE CHAVANNE.

Witnesses:

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D. PRICOT.