

No. 658,516.

Patented Sept. 25, 1900.

J. W. SMITH.

DEFLECTOR FOR HYDRAULIC NOZZLES.

(Application filed Mar. 28, 1900.)

(No Model.)

Fig. 1.

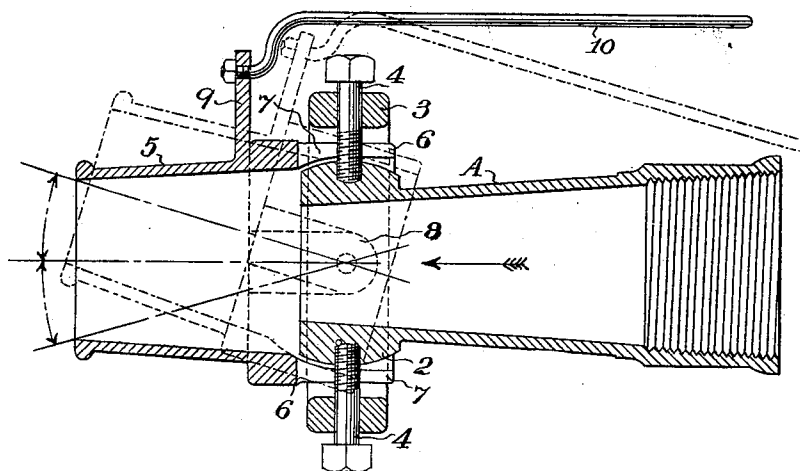
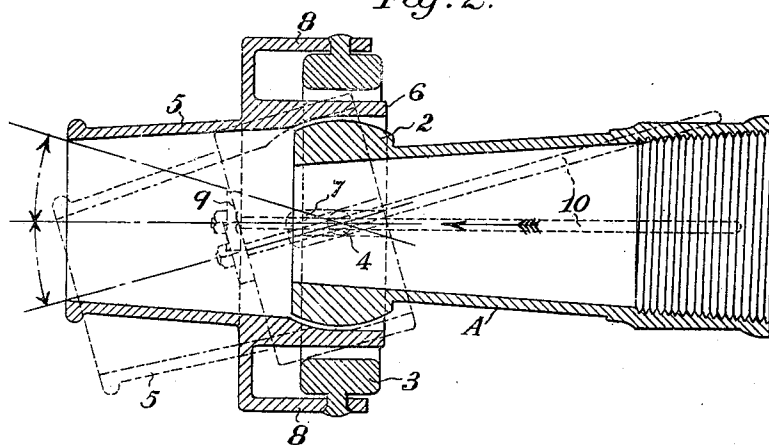


Fig. 2.



Witnesses,

E. A. Brandage
J. H. Truse

Inventor,

Joseph W. Smith
Duway Strong & Co.
Atty

UNITED STATES PATENT OFFICE.

JOSEPH W. SMITH, OF WEAVERVILLE, CALIFORNIA.

DEFLECTOR FOR HYDRAULIC NOZZLES.

SPECIFICATION forming part of Letters Patent No. 658,516, dated September 25, 1900.

Application filed March 28, 1900. Serial No. 10,477. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. SMITH, a citizen of the United States, residing at Weaver-ville, county of Trinity, State of California, have invented an Improvement in Deflectors for Hydraulic Nozzles; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for changing the direction or line of nozzles through which water is discharged under a high head or great pressure.

It consists of a supplemental pipe and means for supporting it axially in line beyond the main nozzle and means whereby it may be turned from side to side vertically or in other directions, so that the stream of water issuing from the nozzle will impinge upon this extension and will by thus acting upon it force the main nozzle to the opposite direction by the reactionary force of the water upon the supplemental nozzle while held in this position. The supports for the supplemental nozzle are of such a character that when the latter is released it will be returned to a position axially with the main nozzle and will not interfere with the stream therefrom or have such effect upon it as to change the direction of the main nozzle.

Referring to the accompanying drawings, Figure 1 is a longitudinal vertical section. Fig. 2 is a longitudinal horizontal section.

The term "hydraulic nozzle" is generally applied to the whole apparatus, which is used in washing down banks of earth, and especially for the purpose of washing down such banks as contain gold in quantities too small to be handled in any other manner. These "nozzles," so called, are pipes of from twelve to twenty feet in length and having a discharge-tube which is often as great as eight inches in diameter. The pipe itself has a universal joint at the rear end, about which it is turnable with little or no leakage, and this connects it with a stationary supply-pipe which brings water to it usually from the reservoir situated several hundred feet above, so that a very great pressure is produced to force the water through the pipe. This pressure makes it very difficult to turn the pipe when it is desired to change the direction, and my invention is designed to

utilize the force and pressure of the water against a surface carried by the pipe and turned at such an angle that the stream leaving the nozzle and striking this surface will force the end of the pipe around toward the side against which the water is caused to strike. A difficulty arising from the use of such devices is the danger of the deflecting-surfaces being accidentally turned into the line of the streams, and this will cause the pipe to be thrown violently to one side or the other to the great danger of the operators.

In my device, A represents a discharge end of a hydraulic nozzle of the class referred to. Upon the outer end of this nozzle is a ring 2, which is practically the central section of a globe, its outer periphery being curved and globular. Exterior to this fixed ring is another ring 3 of larger diameter, and this ring is pivoted to the fixed ring 2 by swivel-points 4, which may be in the form of screws, passing through the ring 3 and having the points adapted to fit in corresponding sockets in the ring 2.

5 is a pipe having a larger diameter than the internal diameter of nozzle A and having connected with its rear end a section 6 of sufficiently-larger diameter to extend and fit loosely over the globular outer surface of the fixed ring 2. This extension 6 is slotted, as shown at 7, so that the slots fit around the pivoted or swivel pins or screws 4. Upon the sides of this supplemental nozzle and at right angles with the slots 7 are lugs 8. These lugs extend outwardly and then rearwardly parallel with the sides of the portion 6, and they are pivoted to the sides of the ring 3 at right angles with the pivot-pins 4. Upon the top of this supplemental nozzle and fixed firmly thereto is a standard 9, and from this standard a lever-arm 10 extends rearwardly above the main nozzle A. The rear part of the supplemental nozzle 5 is as close to the front of the main nozzle A as is practicable, while allowing it freedom of motion to turn. By continuing the front of the ring 2 in its globular form and making the shoulder or portion between the sections 5 and 6 of the supplemental nozzle, of suitable shape, this supplemental nozzle, turnable about its two lines of pivot-pins, would adjust itself over the curvature of the ring 2 and make a suffi-

ciently-close joint to prevent the escape of water rearwardly, while at the same time leaving this nozzle sufficiently distant from the surface of the ring 2 to allow it to turn freely and without any great amount of friction. This supplemental nozzle may be turned to one side or the other up, down, or diagonally about the two lines of pivots by means of the lever 10, and when so turned the stream of water issuing from the main nozzle A will impinge against the side of the nozzle 4, which is brought into line with it, and the pressure against this nozzle will force the main nozzle to turn about its joint connection with the fixed pipe to any desired degree. As soon as the lever 10 is released the nozzle 5 will be returned to a position axial with the main nozzle and will not interfere with the discharge of a solid stream therefrom, and this is an important feature of my invention, because it prevents any accidental turning of this nozzle, so as to unexpectedly change the direction of the main nozzle and discharge.

If the supplemental nozzle be turned so that the water from the main nozzle impinges upon it, but is not held with any pressure, the stream will return the supplemental nozzle to its axial position without affecting the main nozzle or acting in any way to turn it, and this provides an element of safety not hitherto found in this class of devices.

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

1. The combination with a hydraulic nozzle, of a spherical segment fixed to the outer

end, a ring of larger diameter pivoted and turnable about said segment, a supplemental, tubular nozzle having the rear end projecting between the two rings and slotted coincident with the pivot-points of the outer ring, said nozzle having upon its rear lugs which extend outwardly and thence rearwardly substantially parallel with the sides of said slotted portion, and said lugs being also pivoted to the outer ring at right angles with the first-named pivots.

2. The combination with a hydraulic nozzle and discharge-pipe of a spherical segment fixed to the outer end of the pipe, a supplemental tubular pipe having the rear end enlarged and loosely turnable over the spherical segment, and having open slots at opposite sides, a ring of larger diameter, pivot-pins connecting said ring with the interior spherical segment and passing through the slots in the supplemental pipe, lugs connected with the supplemental pipe extending outwardly and thence rearwardly substantially parallel with the sides of the rear portion of the supplemental pipe, and pivot-pins by which said lugs are connected with the exterior ring at right angles with its connection to the spherical segment, and a lever whereby the supplemental pipe is turnable about either of its pivots with relation to the main nozzle.

In witness whereof I have hereunto set my hand.

JOS. W. SMITH.

Witnesses:

R. M. STILLER,
JOHN MCMURRY.