No. 679,247. Patented July 23, 1901.

P. WHITING.

CYLINDER VALVE.

(No Model.) (Application filed July 25, 1900.)

3 Sheets—Sheet 1.

Fig. 1

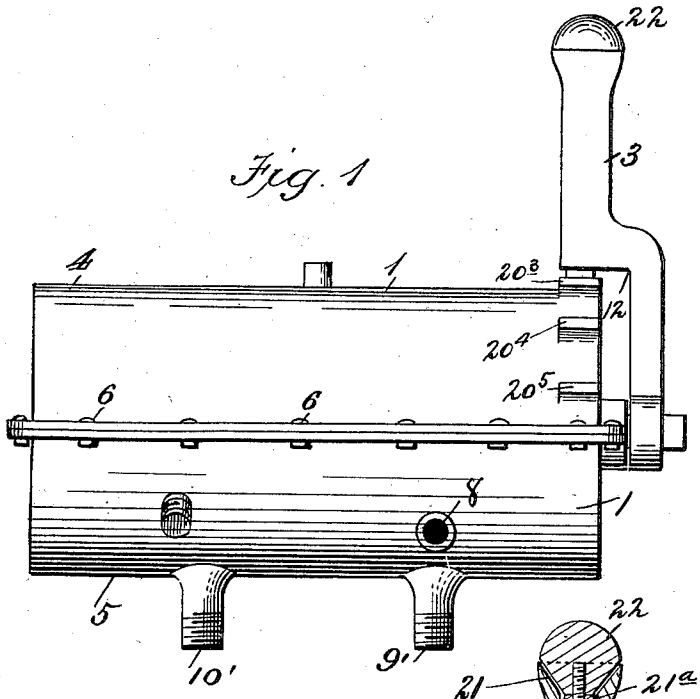
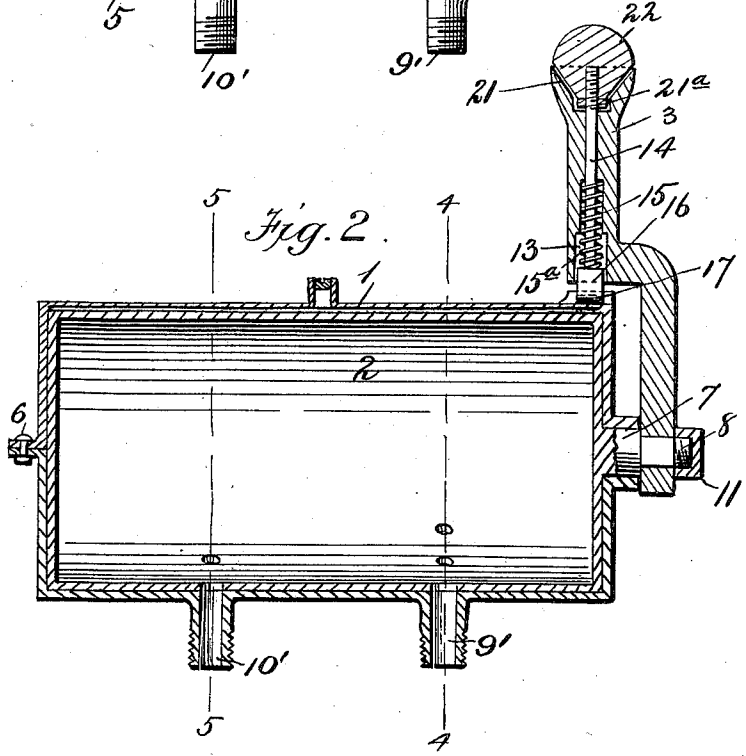


Fig. 2.



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Fig. 3.

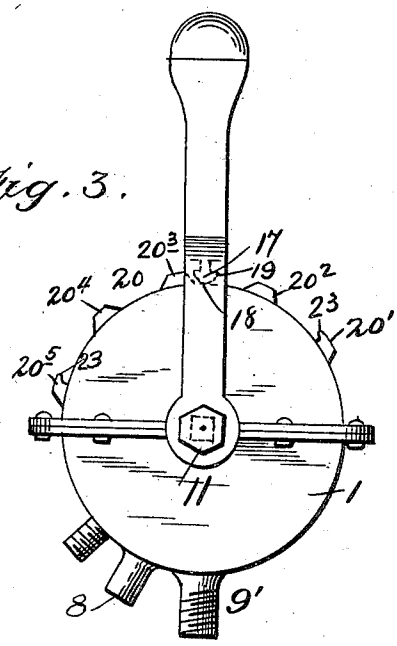


Fig. 4.

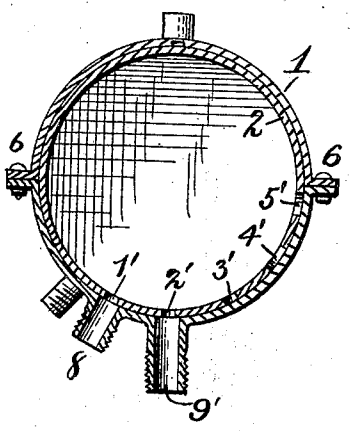
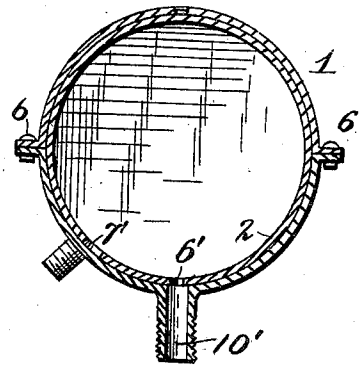


Fig. 5.



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3 Sheets—Sheet 3.

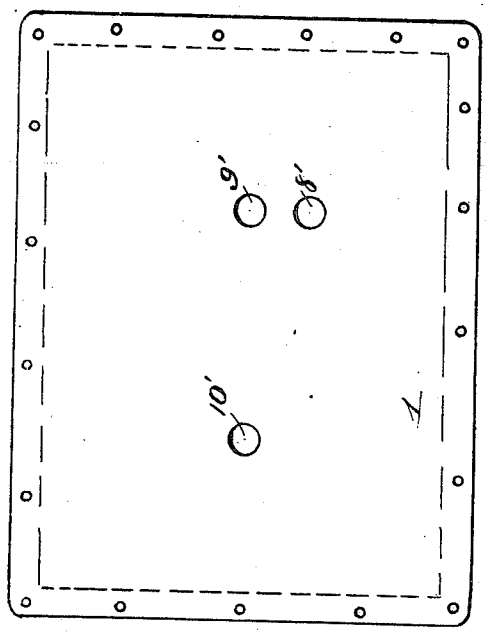


Fig. 6.

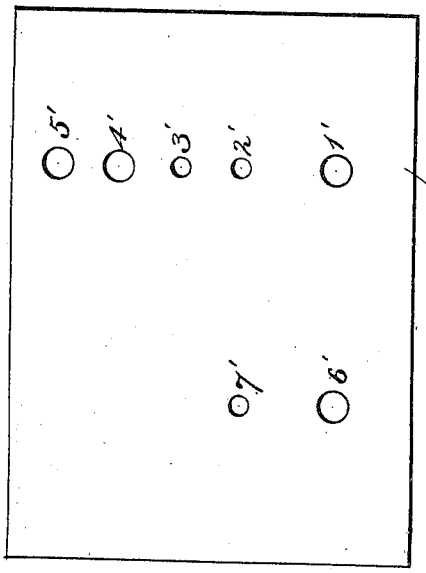


Fig. 7.

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UNITED STATES PATENT OFFICE.

PAUL WHITING, OF EAST LASVEGAS, TERRITORY OF NEW MEXICO.

CYLINDER-VALVE.

SPECIFICATION forming part of Letters Patent No. 679,247, dated July 23, 1901.

Application filed July 25, 1900. Serial No. 24,837. (No model.)

To all whom it may concern:

Be it known that I, PAUL WHITING, a citizen of the United States, residing at East Lasvegas, in the county of San Miguel and Territory of New Mexico, have invented new and useful Improvements in Cylinder-Valves, of which the following is a specification.

My invention relates to valves; and the objects of the same are to provide a valve of simple construction, by which several cut-offs and connection may be quickly made by a simple turn of the valve-cylinder and the same be locked in place corresponding to the different positions.

My valve is also designed so that amounts of air or steam admitted to or released from pipes or a cylinder may be regulated by setting my valve-cylinder at different points.

My valve is especially adapted for use in air-brake systems and was constructed with this end in view; but it will be obvious that it may be used for other purposes.

In the drawings which accompany this specification and of which they form a part, Figure 1 is a side elevation of my device. Fig. 2 is a longitudinal section with handle on the center. Fig. 3 is an end elevation of the same. Fig. 4 is a transverse section through the first series of ports. Fig. 5 is a transverse section through the second series of ports. Fig. 6 is a development of the lower half of the outer cylinder. Fig. 7 is a development of the lower half of the inner cylinder.

My valve consists of three principal parts—an outer cylinder 1, an inner cylinder 2, and a handle 3. The outer cylinder 1 is made of two pieces 4 and 5, clamped together by bolts 6. The inner contour of the outer cylinder 1 is ground to fit as snugly as possible the outer contour of the inner cylinder 2, which is correspondingly ground and finished to insure a perfect fit. The inner cylinder 2 is fitted with a stub-shaft 7, which projects through the end of the outer cylinder 1 and has screw-threads 8 formed on its outer end. The inner cylinder is hollow and is provided with seven ports, numbered from 1′ to 7′. (See Fig. 7.) The ports from 1′ to 5′, inclusive, lie in a vertical plane perpendicular to the axis of the cylinder. The ports 6′ and 7′ lie in a second vertical plane parallel to the first. The ports 1′ and 6′ are situated in a plane parallel to the axis of the cylinder; likewise the ports 2′ and 7′. The distance between the ports 4′ and 5′, 3′ and 4′, and 2′ and 3′ is made equal, for a purpose that will hereinafter appear. The outer cylinder is fitted with three ports 8′, 9′, and 10′. The ports 8′ and 9′ are separated by a distance equal to the distance between the four ports 4′ and 5′ and are situated in the same vertical plane as the ports 1′ to 5′. The port 10′ is in the same vertical plane with the ports 6′ and 7′ and in the same plane parallel to the axis as 9′. The ports are of different sizes, as will appear hereinafter. The handle 3 of my device is rigidly secured to the stub-shaft 7 by means of a nut 11, fitting the screw-threads 8. The handle 3 has an offset at 12, so that it extends over the end of the cylinder 1. It is longitudinally pierced by the bore 13, which is shaped to accommodate a rod 14, a spring 15, surrounding said rod, and an enlargement 16, formed integral with said rod 14. The spring is held firmly between shoulders 15 and 15^a. A catch 17 is formed on said enlargement 16, which serves to engage lugs 20 on cylinder 1. The catch 17 consists of two oppositely-extending toes 19 and is convex at 18 to facilitate its rising over said lugs 20. A cup-shaped recess 21 is formed in the top of the handle 3, and seated therein is a nut 21^a, threaded on the rod 14, and a frusto-conical knob 22, also threaded on said rod 14 and fitting snugly said recess. A series of five lugs 20 are formed on the upper half of the cylinder 1 and serve as stops for the catch 17. The two end lugs 20′ and 20^5 are provided with overhanging lips 23. These lips serve to engage the projections 19 on the catch 17 and limit the movement of the handle. The intermediate lugs 20^2, 20^3, and 20^4 are beveled on both sides, so that the catch 17 is enabled to ride over them when a special effort is made by the operator; otherwise they serve to limit its movement. These lugs 20 are set to conform with the ports numbered 1 to 10, hereinbefore described.

The arrangement I have adopted and which is particularly designed for an air-brake system which is the subject of another applica-

tion for patent, Serial No. 28,311, filed August 28, 1900, is as follows: When the handle 3 is turned around to the right in a position with the catch 17 engaging the lug 20′, the port 9′ registers with the port 5′ and the port 4′ registers with the port 8′. When the handle is moved over to the lug 20^2 the ports 9′ and 4′ will register also with the ports 3′ and 8′. When the handle is moved over to the lug 20^3, (this is the cut-off position,) none of the ports will register. When the handle is set at the lug 20^4, the ports 10′ and 7′ and 2′ and 9′ will register. When the handle is set at the lug 20^5, the ports 10′ and 6′ and 1′ and 9′ will register. In this system I also make the ports 1′, 4′, 5′, 6′, 8′, 9′, and 10′ large, while the ports 2′ 3′ 7′ are made much smaller. By this arrangement I may regulate the amount of supply or exhaust through my valve. Since the air or steam must always traverse four of the ports, the intervention of one small port will decrease the amount which can traverse the valve.

The operation of my device can now be easily understood. We will suppose that an exhaust-pipe is connected to the port 8, a supply-pipe joined to a reservoir to the port 10, and a pipe leading to the machinery to be operated to the port 9. When the handle is thrown against the lug 20′, the cylinder of the machinery will be exhausted very rapidly because of the large ports. When the handle is thrown against 20^2, the cylinder will exhaust slower because of the small ports. When the handle is brought on the center abutting lug 20^3, all connection will be cut off. When it is brought over to lug 20^4, a small amount of air will be supplied to the cylinder. When it is brought over against 20^5, a large amount of air will be supplied.

I do not wish to be limited as to specific details, as these may be modified in many particulars without departing from the spirit of my invention.

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

1. In a valve the combination of a hollow inner cylinder, an outer cylinder fitting snugly said inner cylinder, a first series of ports which pierce the wall of the inner cylinder all situated in a plane substantially at right angles to the axis of said cylinder, a pair of ports in said outer cylinder, positioned in the same plane with said first series of ports, a second series of ports piercing said inner cylinder and positioned in a plane substantially perpendicular to the axis of said cylinder, a port in said outer cylinder situated in the same plane as said second series of ports, means for revolving said inner cylinder.

2. In a valve the combination of a hollow inner cylinder, an outer cylinder fitting snugly said inner cylinder, ports in said inner cylinder, ports piercing said outer cylinder, a handle secured to said inner cylinder, a catch convex on the bearing-surface seated in said handle, a spring for actuating said catch, and a series of lugs positioned on said outer cylinder, the two end lugs having overhanging lips to engage said catch and limit its movement, and the intermediate ones being beveled so that the catch may be forced to ride over them.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

PAUL WHITING.

Witnesses:
CHAS. F. MILLER,
W. B. BUNKER.