(No Model.) 2 Sheets—Sheet 1.

J. B. MAAS.

STEAM ACTUATED VALVE.

No. 368,294. Patented Aug. 16, 1887.

Fig. 1.

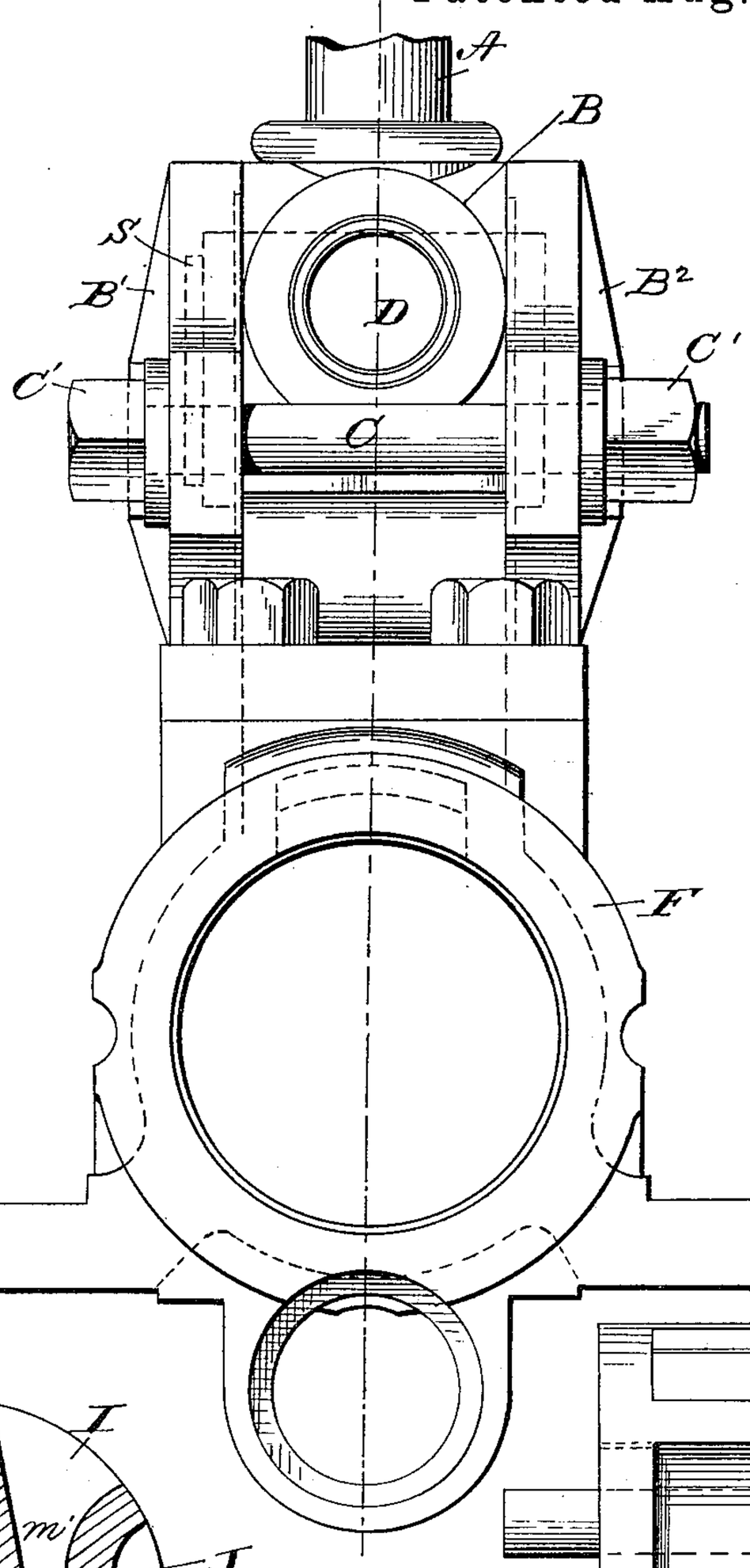


Fig. 3.

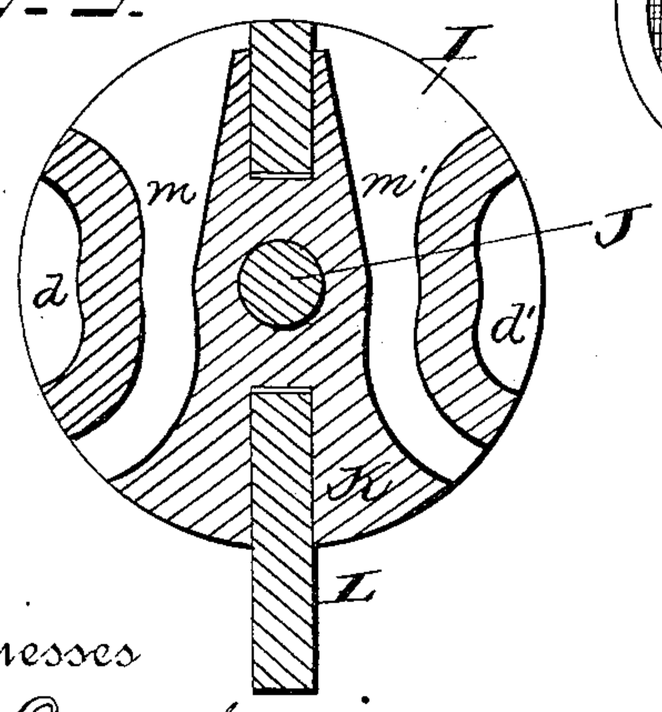
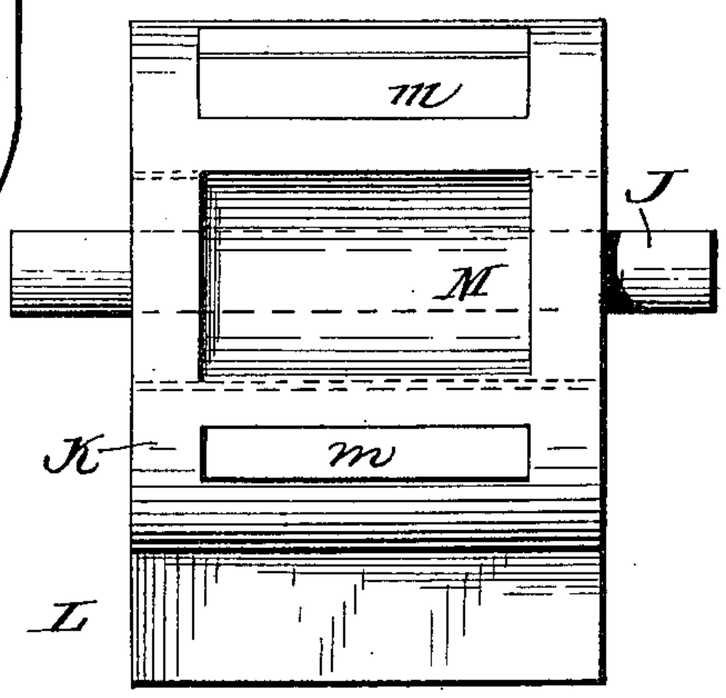


Fig. 4.



Witnesses
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A. M. Bright

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By his Attorney
Frank A. Fouts.

(No Model.) 2 Sheets—Sheet 2.

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STEAM ACTUATED VALVE.

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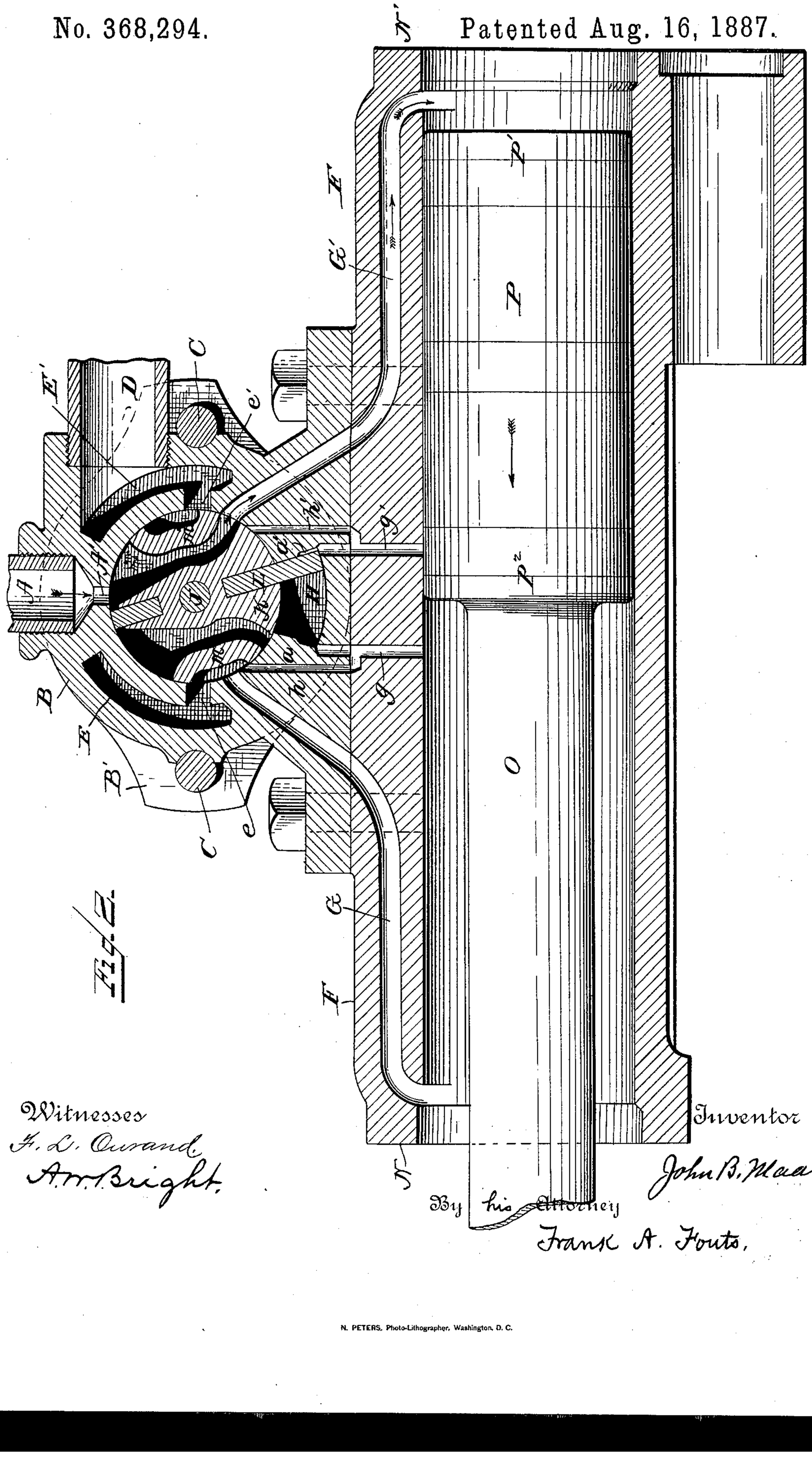

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN B. MAAS, OF HUMBOLDT, MICHIGAN.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 368,294, dated August 16, 1887.

Application filed December 27, 1886. Serial No. 222,561. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. MAAS, a citizen of the United States, residing at Humboldt, in the county of Marquette and State of Michigan, have invented certain new and useful Improvements in Steam-Actuated Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an oscillatory valve which may be actuated by either air or steam; and it consists in the parts which will be hereinafter described, and pointed out in the claims.

For the purpose of this specification the term "air" will be employed as the actuating medium.

The valve and attached parts herein shown are particularly adapted for use in connection with a rock-drill. It is obvious, however, that the invention is adapted for other purposes.

In the accompanying drawings, Figure 1 represents an end view of a cylinder having the valve mounted thereon. Fig. 2 is a central vertical longitudinal sectional view of the parts shown in Fig. 1. Fig. 3 is a sectional view of the oscillatory parts of the valve, and Fig. 4 is a side view thereof.

Like letters indicate like parts in the several views.

The letter A represents the induction-pipe, which communicates with the valve through the casing-opening A′. This pipe enters the valve-casing B centrally from the top. The heads or caps B′ B² of the casing are held in place by means of bolts C and nuts C′.

D represents the exhaust-pipe engaged in an opening in the valve-casing. This pipe communicates with the valve.

E E′ represent longitudinal openings in the sides of the valve-casing. These openings extend beyond the end of the valve at one end, and there communicate with the air-space in the valve-cap. Said air-space in the valve-cap is represented by dotted lines, Fig. 1, and indicated by the letter S.

e e′ indicate openings which connect the valve-chamber with the casing-openings E E′.

F represents the cylinder.

G G′ are the main ports, which communicate, respectively, with the outer ends of the cylinder and open into the valve-chamber from opposite sides. Immediately below the valve-chamber is a dovetailed chamber, H. These chambers communicate.

g g′ are vertical ports. The upper ends of these ports communicate with the lower sides of the dovetailed chamber H. The lower ends of said ports communicate with the cylinder.

h h′ indicate branch ports, the lower ends of which communicate, respectively, with the sides of the vertical ports *g g′*. The upper ends of these branch ports open into the valve-chamber at points slightly below but in close proximity to the main-cylinder ports G G′.

The letter I indicates the heads of the valves. J is a shaft passing centrally through said heads.

K is a block mounted on the shaft and having its ends secured to the valve-heads. The lower end of this block is enlarged, and it is curved in the arc of a circle, so as to conform to the cylindrical form of the walls of the valve-chamber.

L represents a wing centrally secured to the under side of the block K. This wing extends downward, and it is adapted to sweep the floor of the dovetailed chamber. The floor of this chamber is in the arc of a circle, so as to conform to the oscillatory sweep of the wing. In the lower side corners of the dovetailed chamber are two recesses, *a a′*. Each of these recesses admits air to the back of the wing when it is against one of the walls of the dovetailed chamber, as shown in Fig. 2. Each recess in turn permits the entrance of sufficient air behind the wing to give it its initial movement.

M M′ indicate two concavo-convex plates, having their respective ends secured to the inner sides of the valve-heads. Air-spaces *m m′* are formed between the sides of the block *k* and the convex faces of the plates M M′. Air-spaces *d d′* within the valve are also formed between the concave sides of said plates and the walls of the valve.

The letters N N′ represent the respective heads of the cylinder.

P indicates the piston, and Q the piston-rod.

The operation is as follows: Compressed air

enters the valve-chamber through the pipe A and opening A′. Air so admitted, when the parts are in the position shown in Fig. 2, passes through the air-space *m′* in the valve and thence through the port G into one end of the cylinder behind the piston, thereby forcing the piston and its rod in the direction of the arrow toward the other end of the cylinder. After the end P′ of the piston has passed the vertical port *g′* air is admitted upward through said port to the recess *a′* in dovetailed chamber back of the wing L. This air-pressure against the wing forces it to the other side of the chamber H, at the same time turning the valve. This action reverses the position of the valve and causes the plate M′ to close the port G′, at the same time establishing communication between the induction-pipe A and port G, whereby air is admitted back of the piston on its end P², thereby causing a return movement of the piston. When the end P² of the piston has passed the vertical port *g*, air is admitted through said port, so as to actuate the wing L and cause a reversal of the valve to the position shown in Fig. 1, and so on continuously. Each of the branch ports *h h′* in turn permits the air to escape from the dovetail chamber when the ports *g g′* are covered by the piston. Air thus making its escape from the dovetailed chamber passes first into the port *g* or *g′*, and thence up the branch port *h* or *h′*, thence through the air-space *d* or *d′*, thence through the opening E or E′, thence into the air-space between the outer casing, cap, and the valve-head, and thence out of the exhaust-pipe D.

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

1. The combination of the valve-casing provided with an induction and two exhaust ports, also provided with two branch ports, each opening into the valve-chamber in close proximity to one of the exhaust-ports, with an oscillatory valve mounted in the valve-chamber, said valve consisting of a block and the side plates, M M′, the lower end of the block being provided with a downwardly-extending wing, and the casing below the block provided with a chamber for the reception of the wing aforesaid, said casing being also provided with ports opening into the respective sides of the wing-chamber, substantially as described, and for the purposes set forth.

2. The combination of the valve-casing provided with an induction and two exhaust ports, also provided with two branch ports, each opening into the valve-chamber in close proximity to one of the exhaust-ports, with an oscillatory valve mounted in the valve-chamber, said valve consisting of a block provided with a downwardly-extended wing and side plates, the casing below the block provided with a chamber for the reception of the wing aforesaid, said casing being also provided with ports opening into the respective sides of the wing-chamber, and the branch relief-ports *h h′*, substantially as described.

3. The combination of the valve-casing provided with an induction and two exhaust ports, a cylinder, and piston, with a casing provided with two branch ports, each opening in the valve-chamber and into the respective ends of the cylinder, an oscillatory valve mounted in the valve-chamber, said valve consisting of a block provided with a downwardly-extended wing and side plates, the casing below the block provided with a chamber for the reception of the wing aforesaid, said casing being also provided with two ports which communicate, respectively, with the cylinder and wing-chamber, and two branch relief-ports which communicate with the wing and exhaust-ports, substantially as described, and for the purposes set forth.

4. The combination of the casing provided with a valve-chamber having induction and exhaust ports, said casing being also provided with a wing-chamber, with a valve mounted in the valve-chamber and provided with a block or partition having a wing extending into the wing-chamber, and two ports leading into the respective sides of said chamber, said chamber being provided with recessed sides for the reception of said ports, whereby air may be admitted behind the wing, substantially as described.

5. The combination of a valve-chamber and the wing-chamber with the valve-shaft and valve, said valve consisting of end heads provided with intervening plates and a central block or partition, said block having a wing extending into the wing-chamber, said chambers being provided with induction and exhaust ports, substantially as described, and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. MAAS.

Witnesses:
WM. J. MAAS,
GEORGE J. MAAS.