

(No Model.)

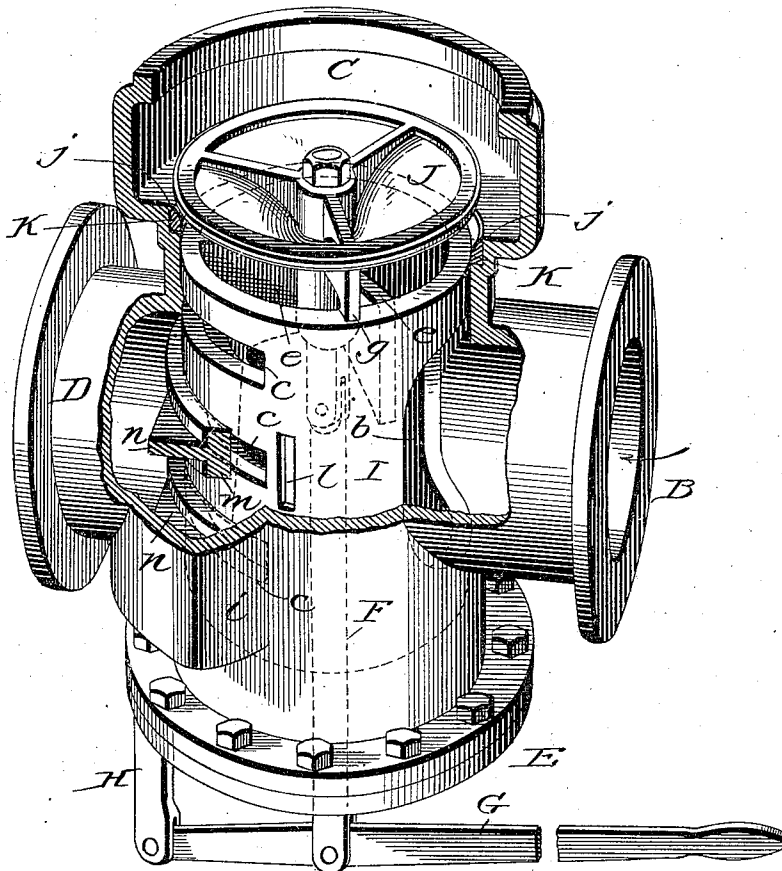
2 Sheets—Sheet 1.

E. REYNOLDS.  
VALVE.

No. 574,939.

Patented Jan. 12, 1897.

*Fig. 1.*



Witnesses  
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

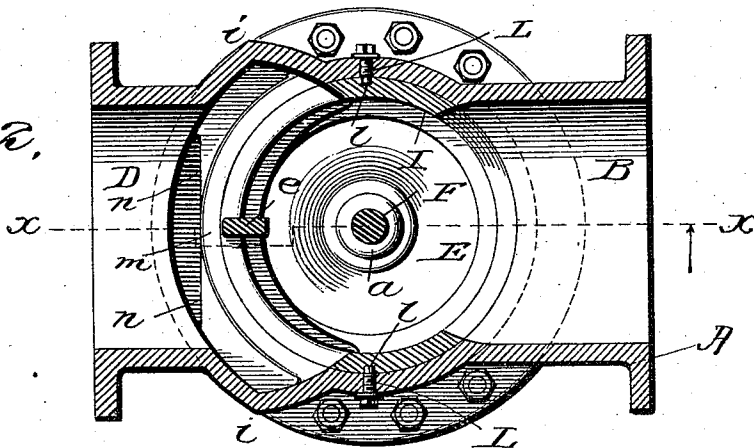
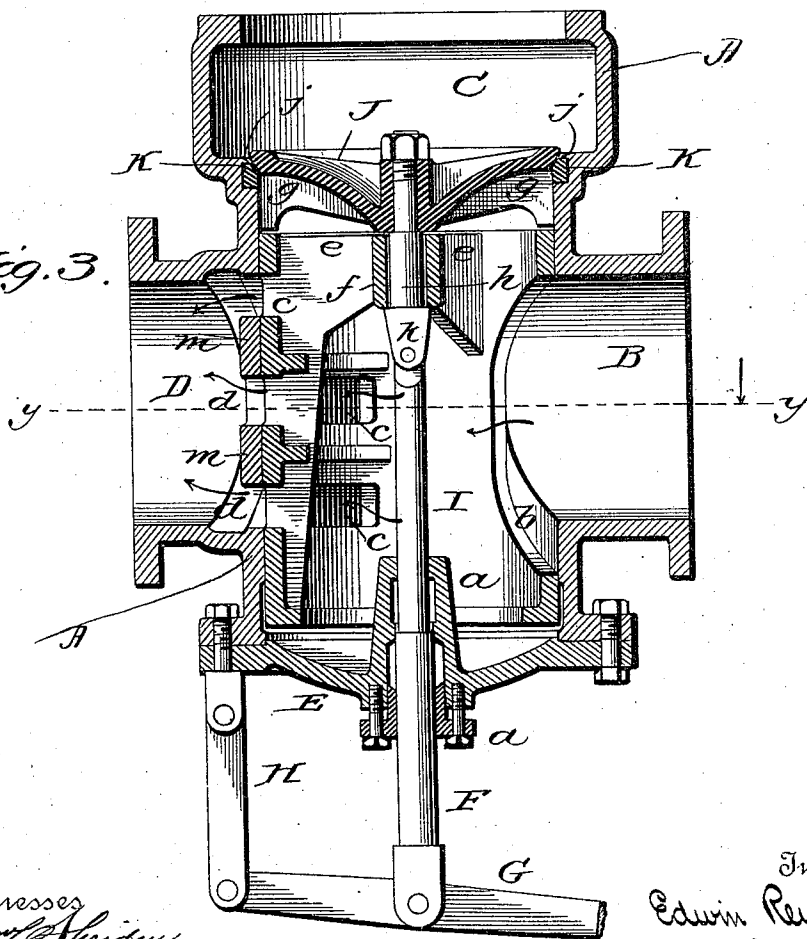


Fig. 3.



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# UNITED STATES PATENT OFFICE.

EDWIN REYNOLDS, OF MILWAUKEE, WISCONSIN.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 574,939, dated January 12, 1897.

Application filed January 9, 1896. Serial No. 574,879. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN REYNOLDS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to valves, the present construction being designed especially for use in connection with condensing-engines.

In the accompanying drawings, Figure 1 is a perspective view, partly in section, of the valve; Fig. 2, a transverse section on the line *yy* of Fig. 3, and Fig. 3 a longitudinal section on the line *xx* of Fig. 2.

Referring to said drawings, A denotes the shell or casing, provided with three openings B, C, and D, the first for the admission of the steam, the second, C, communicating with the atmosphere, and the third, D, communicating with the condenser. It is designed to have the inlet B always open, but the openings C and D are made to open and close in opposition to each other. These latter openings are each provided with a valve, both valves being mounted upon and operated by the same stem.

E indicates a head secured to the shell or casing upon the end opposite to the opening C. The valve-stem F passes through a stuffing-box *a* formed upon said head, and has a lever G connected to its outer end, said lever being pivotally connected to the shell or casing through the arm H.

I designates the valve controlling the opening to the condenser. Said valve is of the cylindrical type in its general form, having an elongated port *b* for the steam to enter, and three ports *c* (more or less) cut through on the opposite side to afford communication with the condensing-chamber. These ports *c* register with similar openings *d* formed in the seat of the valve. Both ends of the cylindrical valve are open, and at that end nearest to the valve J, controlling the outlet to the atmosphere, there are webs or flanges *e*, extending toward and meeting at the center, terminating in a tubular shell or collar *f*. The lower web extends the entire length of the valve, passing over the ports *c*, and connecting and consequently strengthening the ribs between said ports.

The valve J is of the ordinary single-beat type, sitting upon the seat K. Its inner face is provided with ribs or flanges *g*, adapted to guide and center said valve to its seat as it is closed. The seat for this valve is formed of a ring of brass or other suitable metal seated in a groove or recess formed in the casing and held in place therein by upsetting or hammering over the edge or corner of the shoulder just in advance of said ring, as will be clearly seen upon reference to Fig. 3.

The valves I and J are so mounted upon the valve-stem that they move as one, and when one is opened the other is closed, and vice versa. A special form of connection is used to effect the secure and proper relation of these valves to one another and to the valve-stem. It comprises a rod or bolt *k*, having a bifurcated head; a reduced section *h*, adapted to fit loosely within the collar *f*, and a second reduced portion passing through a central opening in the valve J, and a nut secured upon its end. The valve J is firmly held up against the shoulder formed by the enlarged section *h* by the nut.

The valve I has a very slight movement between the valve J and the shoulder on the enlarged end or head of the bolt *k*. This slight movement, taken in connection with the space left between the collar *f* and the section *h*, permits the valve I to readily adapt itself to its seat. The bifurcated head of the bolt *k* is pin-jointed to the valve-stem F. Thus it will be seen that as the lever G is moved the valves I and J will also be shifted.

To insure the ready discharge of steam through the valve I, the casing or shell A is enlarged at that portion marked *i* around the discharge-port of said valve, as will be seen upon reference to Figs. 1 and 2. This not only provides a large discharge-chamber, but permits of the ports *c* being made longer than could otherwise be done.

The ribs *m*, intermediate of the ports *d*, are strengthened by webs or flanges *n*, formed integral therewith and extending across to the enlarged portion *i* of the casing.

The diameter of the casing is enlarged or extended around the discharge-opening C, in order that there may be free access through and around the valve J.

To prevent the valve I from turning in the

shell, there are provided two screws or tap-pets L, extending through the side of said shell or casing and taking into guideways or grooves / in the side of the valve.

5 When the parts are in the position indicated in Fig. 1, steam (or other fluid) has free passage through opening B into the interior of the hollow cylindrical valve I and out and around the valve J, discharging into the atmosphere through the opening C. To cause the steam to pass into the condenser through the opening D, the handle G is shifted to the position shown in Fig. 3. Steam then enters the cylindrical valve I and passes out through the ports c and into the condenser through the opening D.

Having thus described my invention, what I claim is—

1. In combination with the valve-casing provided with an inlet and with two outlets; a valve-stem mounted therein; a single-beat valve and a slide-valve mounted upon the stem, the parts being in such relation that as one outlet is closed the other is open, and vice versa.

2. In combination with the shell or casing provided with an inlet, and two discharge-openings, valves for said discharge-openings, said shell or casing being enlarged or extended at or near the discharge-ports of the valves.

3. In combination with the shell or casing provided with an inlet, and two discharge-openings, a hollow cylindrical valve mounted within said casing and adapted to control one of the discharge-openings, a valve-stem passing through and connected to said cylindrical valve; a second valve mounted upon and secured to the end of the valve-stem and adapted to control the second discharge-outlet, said valves being fixed with relation to each other and so arranged that but one discharge-opening will be closed at a time.

4. In combination with the shell or casing, provided with an inlet and two discharge-

openings, a valve-stem passing through said casing; a hollow cylindrical valve mounted within said casing and adapted to control one of the discharge-outlets; guides for said valve; and a second valve mounted upon the end of the valve-stem, and adapted to control the second outlet.

5. In combination with the valve-casing provided with an inlet; a hollow slide-valve working therein, said valve provided with an extended inlet-port designed to work beneath the inlet and to be open at all positions of the valve; and discharge-ports for the valve.

6. In a valve, the combination with the shell or casing, provided with an inlet and with two exhaust-ports, one leading to the condenser and the other to the atmosphere; of a valve-stem mounted in said casing; a hollow slide-valve provided with an extended inlet-port and an exhaust-port, said valve secured upon the valve-stem and having its inlet-port working beneath the inlet to the casing and its exhaust-port over the condenser-port; and a second valve also secured to the valve-stem and designed to close the exhaust-port to the atmosphere, the parts being fixed in such relation that the inlet is always open, and one exhaust is closed while the other is open, and vice versa.

7. In a valve, the combination with the shell or casing provided with an inlet-port and exhaust-ports, the casing being enlarged or extended at such points; of a valve-stem mounted in the casing; a hollow slide-valve, provided with an extended inlet-port designed to work beneath the inlet in the casing and with exhaust-ports; and a single-beat valve secured upon the end of the valve-stem, substantially as described.

In witness whereof I hereunto set my hand in the presence of two witnesses.

EDWIN REYNOLDS.

Witnesses:

IRVING H. REYNOLDS,  
WM. E. DODDS.