

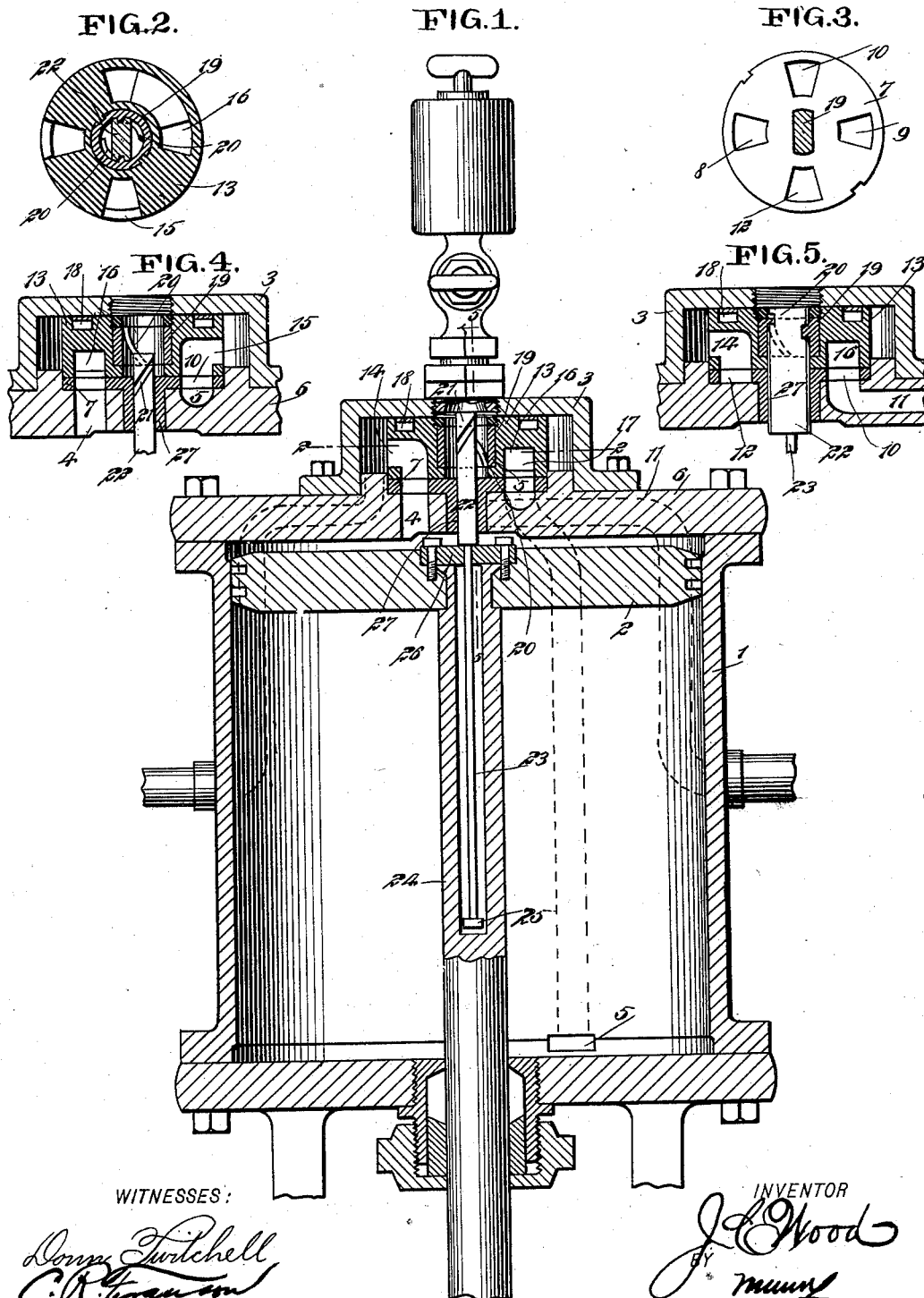
No. 647,351.

Patented Apr. 10, 1900.

J. C. WOOD.
VALVE.

(Application filed Aug. 24, 1899.)

(No Model.)



WITNESSES:

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JOHN CHANDLER WOOD, OF RATON, TERRITORY OF NEW MEXICO.

VALVE.

SPECIFICATION forming part of Letters Patent No. 647,351, dated April 10, 1900.

Application filed August 24, 1899. Serial No. 728,315. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHANDLER WOOD, of Raton, in the county of Colfax and Territory of New Mexico, have invented a new and Improved Valve, of which the following is a full, clear, and exact description.

This invention relates to improvements in valves and means for actuating the same for controlling the entrance and exhaust of a motive agent for actuating a piston in a piston-cylinder; and the object is to provide a valve of simple and economical construction and adapted to be operated by the piston at each end of its stroke.

I will describe a valve embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal section of a piston-cylinder and steam-chest and showing in section a valve embodying my invention.

Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a top view of a valve-seat employed. Fig. 4 is a section similar to Fig. 1, but showing the valve in a different position; and Fig. 5 is a section on the line 5 5 of Fig. 1.

Referring to the drawings, 1 designates a piston-cylinder in which is arranged a piston 2, and on the end of the cylinder is the steam-chest 3. The cylinder-head has a port 4, providing communication between the steam-chest and one side of the piston, and it also has a port 5, providing communication between the steam-chest and the opposite side of the piston.

Seated in a recess formed in the head 6 of the cylinder is a valve-seat 7, having a steam-port 8, registering with the port 4, a steam-port 9, registering with the steam-port 5, an exhaust-port 10 for registering with an exhaust-port 11 through the cylinder, and a blind port 12. This blind port performs no service; but it is provided to equalize the bearing-surface of the valve-seat, and thus equalize the wear on the valve which turns on the valve-seat.

The valve 13 is designed to have a reciprocating motion on the valve-seat 7. This valve is provided with an inlet-port 14 for provid-

ing communication between the steam-chest and the port 4, and it also has a port 15 for providing communication between the steam-chest and the port 5. It also has a recess 16, designed to place either one of the ports 4 or 5 in communication with the exhaust-port 11.

At the lower side this recess 16 has a bridge piece or plate 17, the lower surface of which is on a plane with the lower surface of the valve, and it is designed to equalize the area of the valve, and thus equalize the wear upon the valve-seat. At its upper side the valve 13 has an annular channel 18, in which a suitable packing may be placed.

As before stated, the valve 13 is designed to have a reciprocating rotary motion. This motion is imparted through the agency of the piston as it reaches the ends of its stroke. Arranged in the center of the valve is a bushing 19, on the inner surface of which spirally-disposed ribs 20 are formed. These ribs are arranged one opposite the other, and they are designed to engage in spirally-disposed channels 21, formed in a shifting bar 22.

From the shifting bar 22 a rod 23 extends into the hollow portion of the piston-rod 24, and at its inner end the rod is provided with a head 25. At the end of the piston-rod the rod 23 passes through an opening in a plate 26, removably secured to the piston, so that by removing this plate the rod 23 and the shifting bar may be removed when found necessary for repair or other purposes. The shifting bar 22 is made flat or angular in cross-section and passes through a correspondingly-shaped opening in the valve-seat and in a lug 27, depending from the valve-seat.

In operation and assuming that the motive agent — steam or otherwise — is passing through the valve through the port 4, at this time the port 14 of the valve will be in register with the port 4, and the port 5 will be in communication with the exhaust-port 11. The ports will remain in this position until the piston reaches nearly to the end of its stroke, when the plate 26 by engaging with the head 25 on the rod 23 will draw said rod longitudinally, and consequently draw the shifting bar 22 longitudinally. This movement of the shifting bar will move the valve 13 to place the port 15 in communication with the port 5, and the exhaust will be in communication

with the port 4. Then when the piston moves in the opposite direction to nearly the end of the stroke it will engage with the end of the shifting bar 22 and move it to its forward position, and thus reverse the valve.

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

1. The combination with a cylinder, a piston therein and a steam-chest, of a valve mounted to oscillate on a parallel plane with the face of the piston, and a connection between said valve and the piston, the said connection extending axially into the valve whereby said valve is moved as the piston reaches the ends of its strokes, substantially as specified.

2. The combination with a cylinder, a piston therein and a steam-chest on the cylinder, of a rotatively-oscillating valve having a central opening, spirally-disposed ribs on opposite sides of said opening, a shifting bar having channels for receiving said ribs, and a rod extended from said bar into a hollow portion of the piston-rod, substantially as specified.

3. The combination with a cylinder, a piston therein and having a tubular piston-rod and a steam-chest on the cylinder, of a rotary valve in the steam-chest for governing an exhaust-port and the ports leading into the cylinder, a bushing seated in the center of the

valve, spirally-disposed ribs on opposite sides of said bushing, a shifting bar having channels for receiving said ribs, a rod extended from said bar into the tubular piston-rod, and a head on the inner end of said rod, substantially as specified.

4. The combination with a cylinder, a piston therein and a valve-chest on the cylinder, of a valve-seat seated in the recess formed in a head of the cylinder and having ports for registering with ports leading into the cylinder and also having a port for registering with an exhaust-port, a valve mounted to rotate on said valve-seat and having ports for registering with the ports through the valve-seat, and means operated by movements of the piston to shift the valve, substantially as specified.

5. A valve-seat having ports for registering with steam-inlet ports of a cylinder, a port for registering with an exhaust-port, and a blind port for equalizing the area of the seat, a valve mounted to rotate on the valve-seat, the said valve having steam-inlet ports and an exhaust-recess, and a bridge-plate at the lower portion of said exhaust-recess for equalizing the area of the piston-bearing surface, substantially as specified.

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Witnesses:

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