No. 846,077. PATENTED MAR. 5, 1907.

R. WISHON.

PUPPET VALVE.

APPLICATION FILED AUG. 23, 1905.

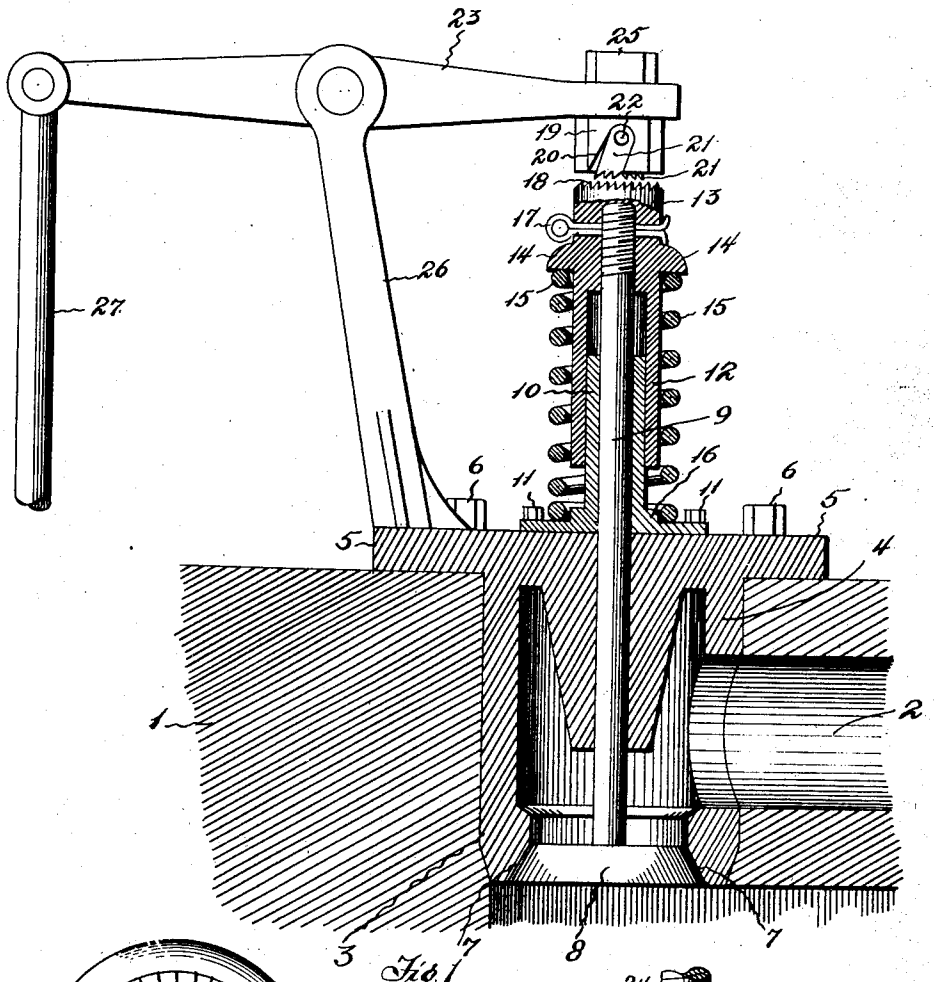


Fig. 1.

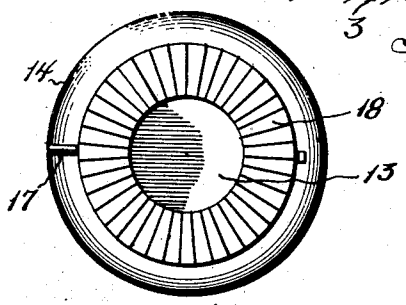


Fig. 2.

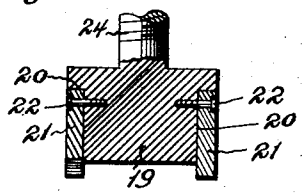


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE

RALPH WISHON, OF COLUMBUS, OHIO.

PUPPET-VALVE.

No. 846,077. Specification of Letters Patent. Patented March 5, 1907.

Application filed August 23, 1905. Serial No. 275,370.

To all whom it may concern:

Be it known that I, RALPH WISHON, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Puppet-Valves, of which the following is a specification.

My invention relates to new and useful improvements in puppet-valves.

The object of the invention is to provide a suitable guide for the valve-stem, to produce a greater bearing-surface, and to reduce the wear on the stem and cause the valve to seat truly.

Another feature resides in the provision of means for positively turning the valve-head on its seat prior to its movement therefrom. This arrangement perfects a grinding operation which prevents accumulation of deposits on the seat-valve and also removes all roughness, at the same time permitting the valve to close tightly. This constant grinding, while very slight, maintains the parts in perfect operative order and prolongs the period when regular grinding becomes necessary.

A still further object is to provide mechanical means for assuring a positive turning of the valve and to prevent any movement of the valve from its seat until the turning movement has been completed.

Finally, the object of the invention is to provide a device of the character described that will be strong, durable, efficient, simple, and inexpensive to make and one in which the several parts will not be liable to get out of working order.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein—

Figure 1 is a transverse vertical sectional view of my improved valve and a portion of the cylinder-head on which it is mounted, portions of the valve-operating mechanism being shown in elevation. Fig. 2 is a plan view of the cap portion of the outer sleeve, and Fig. 3 is a transverse sectional view through the tappet and its pawls.

In the drawings, the numeral 1 designates a portion of the cylinder-head, which is provided with the usual port 2 and valve-casing opening 3. Within the opening 3 a suitable valve-casing 4, having communication with the port 2, is snugly fitted. The casing is provided with a flange 5, which rests on the outer surface of the head 1 and through which screw-bolts 6 are passed into the head to hold the casing in place. The casing is formed at its lower end with an annular inclined valve-seat 7, in contact with which an annular conical valve-head 8 closely engages. An elongated stem 9 extends from the head 8, passing through the central portion of the casing 4. The stem projects some distance beyond the casing and passes through a sleeve 10, flanged at its lower end and secured upon the valve-casing by screw-bolts 11, which pass through the flanged portion. The sleeve 10 fits snugly about the stem, so as to act as a guide and prevent lateral play, but loosely enough to allow the stem a free longitudinal movement. An outer sleeve 12 fits snugly about the sleeve 10 so as to freely slide thereon and is provided with a cap portion 13, the latter being provided with an annular collar 14. The sleeve 10 extends into the sleeve 12 some distance, so as to assure a free and easy movement of the sleeve 12 without the liability of the same getting out of alinement. A coiled spring 15, confined between the collar 14 and the flanged portion of the sleeve 10, is held in place at its lower end by an annular collar 16, formed about the sleeve 10. The spring 15 is tensioned so as to move the valve-stem longitudinally and draw the head 8 into close engagement with the valve-seat 7, the sleeve 10 terminating a sufficient distance from the cap portion 13 of the sleeve 12 to allow the latter liberal play. The spring thus being under tension will immediately draw the head 8 to the seat when pressure exerted on the cap to open the valve is relieved.

The upper end of the valve-stem is screw-threaded and passed into the cap portion, and a cotter-pin 17, passed through the cap and the stem, locks the parts together and prevents independent movement. On the upper surface of the cap a ring of ratchet-teeth 18 is provided. These teeth as shown in the drawing have been somewhat enlarged for the purposes of illustration; but it is to be understood that in practice they are to be comparatively fine, there being about thirty-two teeth to the inch. Supported directly above the cap and the teeth 18 I provide a tappet 19, which is provided on opposite sides with angular recesses 20. In the re-

cesses pawls 21 are pivotally mounted on pins 22. The pawls bear at their upper ends against the surface of the recesses, so that all force exerted on the pawls is absorbed by the tappet, thus taking the strain off the pins. The recesses 20 are flared, so as to allow the pawls a swinging movement at their free ends substantially equal the distance between two of the teeth 18. The pawls normally rest in contact with one wall of the recesses, as clearly shown in Fig. 1. When the tappet is moved toward the cap 13, the lower ends of the pawls 21, which are provided with teeth, will engage with the teeth of the ring 18, and continued movement of the tappet will cause the pawls to swing to one side, and thus impart a slight turning movement to the cap and the valve-stem before the tappet comes in contact with the cap and without moving any of the parts longitudinally. The parts are thus given a full one-tooth movement, as the pawls can only move the distance allowed by the recesses. When the pawls have been swung to the end of their movement, continued movement of the tappet will cause it to engage with the cap portion 13 and move the valve-stem 9 and sleeve 12 longitudinally against the tension of the spring 15, and thus move the valve-head 8 from its seat 7. The sleeve 10 being fixed to the valve-casing serves as a guide for the valve-stem 9 and the sleeve 12, which also acts as a guide, all liability of lateral play or of the valve-stem moving out of alinement being thus obviated.

Particular stress is laid on the turning of the valve-head 8 on the seat 7 prior to the initial movement of the valve-head from the seat. This being accomplished by mechanical means such as I have described assures a positive action, and the possibility of the valve-head being moved from the seat prior or during the turning movement is reduced to a minimum, so that the seat and the valve-head are at all times free from deposits or rough surfaces. It will be obvious that the valve-seat being ground by the turning of the valve-head at each movement thereof will require less attention and the periods when regular grinding becomes necessary will be greatly lengthened.

For operating the tappet 19 I have shown the same supported on the end of a rocker-arm 23, to which it is secured by a screw-threaded stem 24 and a nut 25. The rocker-arm 23 is pivotally supported centrally at the upper end of a post 26, formed on the flange 5 of the valve-casing 4. To the outer free end of the rocker-arm a rod 27 is pivotally connected, said rod being connected to the operating means, which will be governed by the type of device to which the valve is applied. It will be apparent, however, that the movement or throw of the valve-head can be governed by the rod 27, which when moved longitudinally will cause the arm 23 to swing and throw the tappet 19 into and out of contact with the cap portion 13.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A valve provided with a stem and a head, telescoping sleeves for guiding the valve-stem and maintaining the same in alinement, a suitable seat for the head, mechanical means for positively turning the valve-head on the seat before moving the same from the seat, and resilient means surrounding the sleeves for holding the head of the valve to the seat.

2. The combination with a valve and valve-stem, of a toothed member to which said valve-stem is secured, a reciprocatory member arranged adjacent said toothed member and having recesses formed therein, and pawls located in said recesses, the walls of said recesses limiting the movement of said pawls.

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

RALPH WISHON.

Witnesses:
F. B. MORRIS,
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