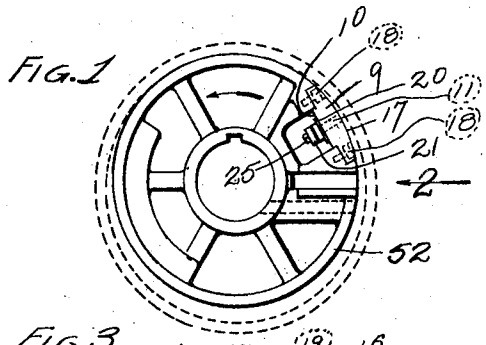
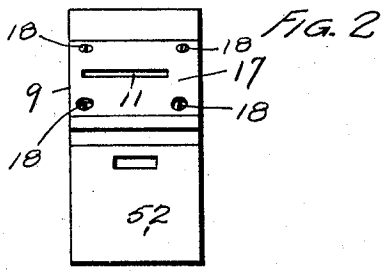
July 31, 1928. 1,679,012

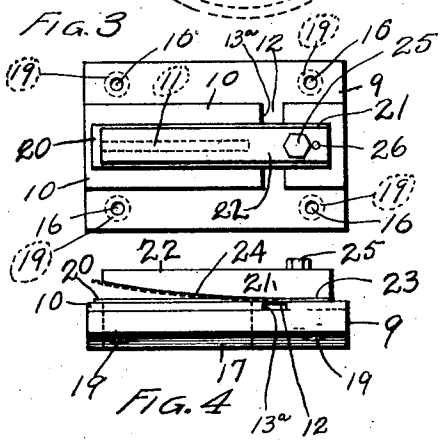
E. WILSON

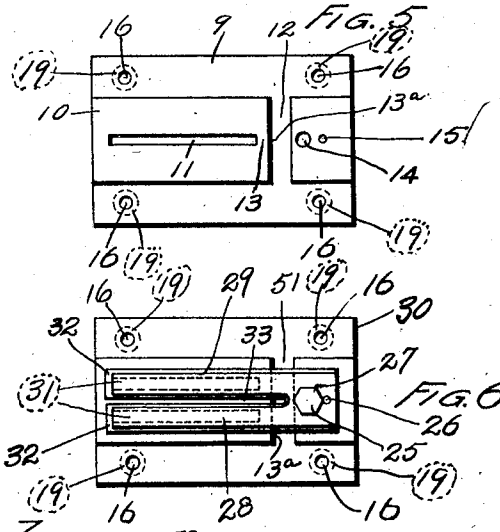
VALVE

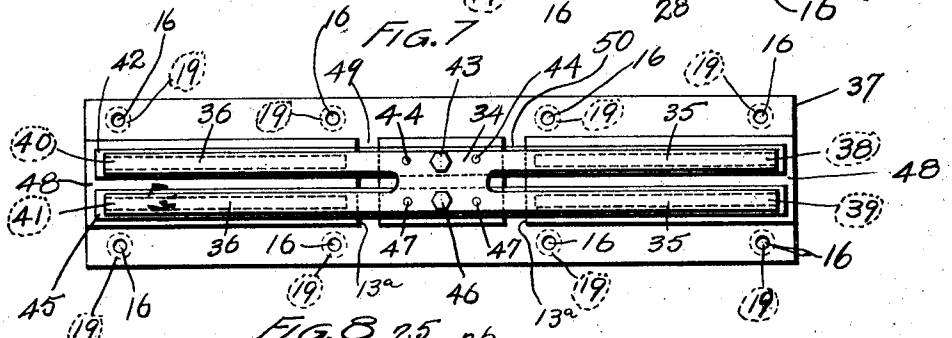
Filed Dec. 26, 1925

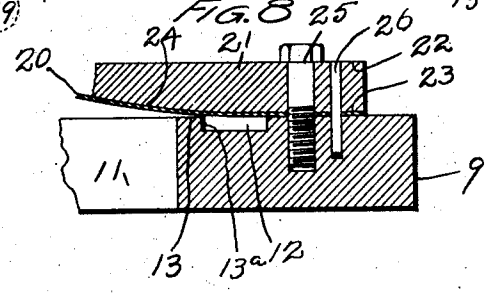












INVENTOR
EDWARD WILSON
BY Edwards & Angell
ATTY.

Patented July 31, 1928. 1,679,012

UNITED STATES PATENT OFFICE.

EDWARD WILSON, OF ST. LOUIS, MISSOURI, ASSIGNOR TO NATIONAL PUMP AND COMPRESSOR COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF DELAWARE.

VALVE.

Application filed December 26, 1925. Serial No. 77,689.

My invention relates to improvements in valves, and has for its primary object a valve which is substantially noiseless in operation.

A still further object is to construct a valve wherein the moving part is operated only through a small distance but at the same time a relatively large free and unobstructed discharge is permitted.

A still further object is to construct a feather valve in such a manner that there is substantially no possibility of foreign substance lodging under the valve and prevent the same from seating tightly.

My device is intended primarily for use in rotary compressors and similar purposes although the same can be used for other purposes.

In the drawings:—

Fig. 1 is an end view of a rotor such as is used in rotary compressors showing my device in position;

Fig. 2 is a face view of the same looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is an enlarged top plan view of my valve;

Fig. 4 is a side elevation of the same;

Fig. 5 is a top plan view with the valve and stop removed;

Fig. 6 is a top plan view of a valve similar to that shown in Fig. 3 but which is provided with two outlet ports;

Fig. 7 is a top plan view of a double ended valve; and

Fig. 8 is an enlarged fragmental longitudinal section showing the position of the valve when open.

In the construction of my device I employ a valve block 9 which is provided with a raised face or seat 10. Formed through the block and seat is a longitudinally extending port 11. The seat 10 is provided with a laterally extending channel 12, which is located at some distance to the rear of the port 11 thus leaving a border 13 with a shoulder 13a. Formed in the block 9 is a screw threaded opening or bore 14 and a cylindrical opening 15. The purpose of these will be explained in detail later. The block 9 is also provided with openings 16, which are preferably counter-bored in the face 17 of the valve. These openings permit screws 18 to be inserted therethrough for securing the valve block in position while the counter-bores 19 receive the heads of the screws so that the same will not project from the face 17.

Resting on the seat 10 in such a manner as to cover the port 11 is a valve 20. This valve is preferably formed of thin spring steel although other flexible material may be used when found necessary or desirable. Placed on top of the valve 20 is a stop 21, which has a flat top surface 22 and a flat bottom surface 23. The flat bottom surface however is relatively short (see Figs. 4 and 8), while the remainder of the bottom surface 24 is curved. The purpose of thus curving the bottom of the stop 21 is to permit the valve to bend without any undue stresses or strains being set up in the valve at any point when the same is raised. Both the stop and valve are provided with bores, which, when the device is placed in position, are in alignment with the bore 14 and through these bores is inserted a screw or bolt 25. This is for the purpose of securing the valve and stop to the block 9. The valve and stop are also provided with a bore through which a pin 26 extends, this pin extending into the bore 15. This is for the purpose of preventing any possibility of the valve and stop pivoting or swinging on the screw.

In Fig. 6 I have shown a modified form of construction in which the stop 27 is provided with two forwardly extending tongues 28 and 29. These tongues have their under side curved in the same manner as the stop 21. The valve block 30 is provided with a pair of ports 31 over which are placed valves 32. These valves are preferably united at the rear end so that only one bolt and pin is necessary. By this construction I obtain a valve which has double the outlet capacity of the valve illustrated in Fig. 3 and without increasing the size of the valve in any way. My purpose of bifurcating the stop 27 and the valves is to form a central passage 33 for the passage of the fluid coming through the ports 31.

In Fig. 7 I have shown another modified form of construction in which a double ended valve is used. In this instance the stop 34 is provided with a bifurcation on each side thus forming tongues 35 and 36. The valve block 37 is provided with ports 38, 39, 40 and 41. In this construction a valve 42 extends over the ports 38 and 40 and is secured by means of the screw or bolt 43 and

pins 44 while the valve 45 extends over the ports 39 and 41 and is secured in position by means of the screw 46 and pins 47. In this construction of valve the seat 48 is provided with passageways 49 and 50, the passage 49 being adjacent the ports 40 and 41 and the passage 50 adjacent the ports 38 and 39. The block 30 illustrated in Fig. 6 is provided with the passage 51 which is adjacent the ports 28 and 29. I will describe the operation of the single port valve only, as the operation of the other types is the same.

When my device has been assembled the valve 20 normally lays close on the seat 10 and being perfectly flat and of greater width than the port will prevent any gas or other fluid from backing out. Upon any gas or other fluid being forced through the port 11, as would be the case in Fig. 1 when the rotor 52 is rotated, the valve is raised as illustrated by dotted lines in Fig. 4 and illustrated in Fig. 8. This will raise the valve until it comes in contact with the underneath surface 24 of the stop 21. When in this position it would be lifted entirely clear of the seat 10 and even the shoulder 13 thus forming an open space between the shoulder and the underside of the valve, which communicates with the passage of cutaway portion 12. It will be noted from Fig. 8 that the flat portion 23 extends partly over this cutaway portion so that there will be no tendency for the valve to lift up from the rib 10 adjacent the screw or bolt 25. Then if any foreign particles, such as dust, lint, grit and the like, should enter the portion 11, the force of the gas or fluid, as it escapes around the valve, would carry this into the cutaway portion 12 and prevent it from lodging on the valve seat at 13. From the passageway 12 this foreign substance would have clear passage so that it could be carried away with the fluid.

By this construction I prevent any possibility of the grit or other foreign substance from lodging on the underside of the valve and preventing the same from seating properly when passage of the gas or fluid through the port 11 is stopped. This would be the case were the passage 12 not present because then there would be free escape on three sides only for any grit or foreign substance while eddy currents would be created on the fourth side adjacent the bolt 25 causing foreign substances to become wedged between the underside of the valve and the top face of the seat 10 and prevent the valve from seating thus causing a leaky valve.

Having fully described my invention, what I claim is:—

1. A valve comprising a block, a seat formed on one face of said block, an elongated port formed through said block and seat, a laterally extending channel formed through said seat adjacent the one end of said port, a strip of flexible material resting on said seat and extending over said channel and port, means having a portion thereof upwardly curved for limiting the upward movement of said strip of flexible material, means for securing said strip of flexible material and limiting means to said block and adjacent said channel and means for restraining said strip and limiting means against lateral shifting.

2. A valve comprising a block, a seat formed on one face of said block, an elongated port formed through said block and seat, a laterally extending channel formed through said seat adjacent one end of said port, a strip of flexible material resting on said seat and extending over said channel and port, means for limiting the upward movement of said flexible strip, means for securing said flexible strip and said limiting means to said block adjacent the channel, and means for preventing side movement of said strip and limiting means.

3. A valve comprising a valve block having one face flat and the other curved to form a continuity of cylinder, a seat formed on the flat face of said block, an elongated port formed through said block and seat, a laterally extending channel formed in said seat adjacent one end of said port, a flexible valve located on said seat and extending over said channel and port, a stop having a portion thereof upwardly curved for limiting the upward movement of a portion of said strip, means for securing said stop and strip to said seat adjacent the channel, means for securing said stop and strip against side movement and means for securing said block in position.

4. A valve comprising a block, a seat located on one face of said block, a rectangular port formed through said block and seat, a flexible valve resting on said seat for normally closing said port, a stop having a portion thereof upwardly curved the remainder being flat located above said valve for limiting the upward movement thereof, means for securing said stop and valve to said block adjacent one end of said port, a laterally extending channel formed in the seat between the valve and stop securing means and the port whereby the accumulation of foreign substances between the seat and valve adjacent the point of securing is prevented and means for preventing side movement of said stop and flexible valve.

In testimony whereof I have affixed my signature.

EDWARD WILSON.