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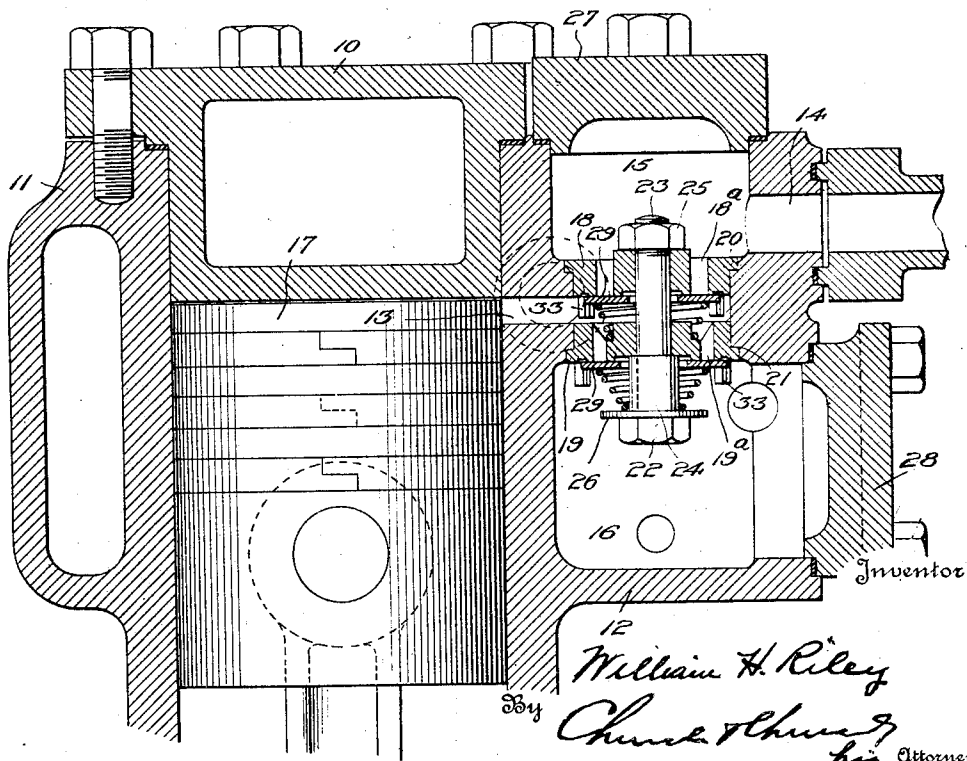
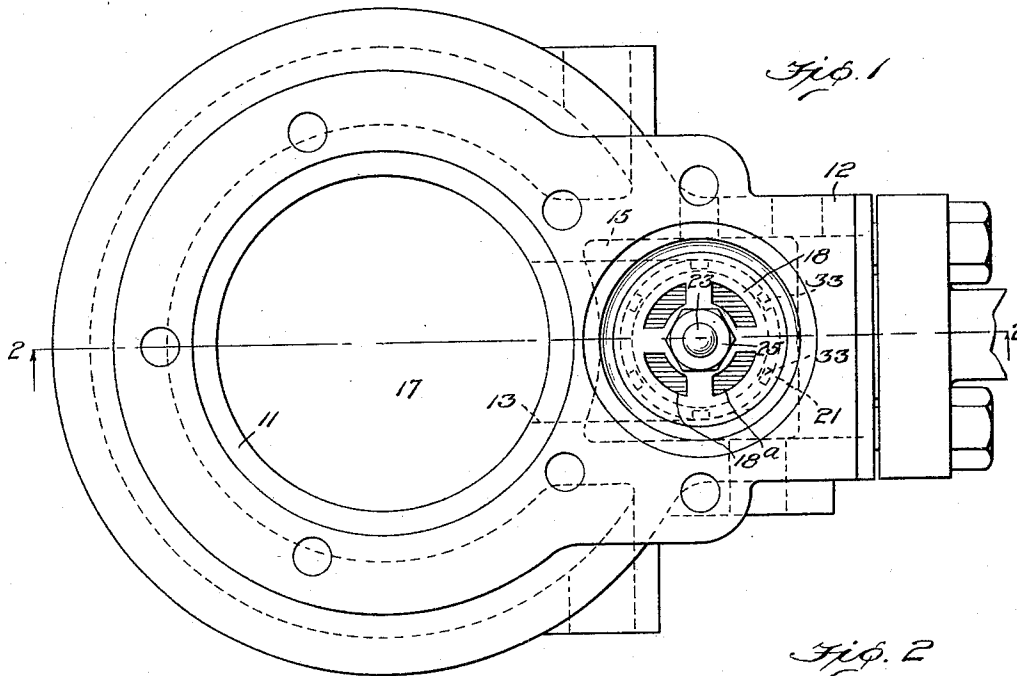
W. H. RILEY

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VALVE MECHANISM FOR FLUID COMPRESSORS

Filed May 13, 1927

2 Sheets-Sheet 1



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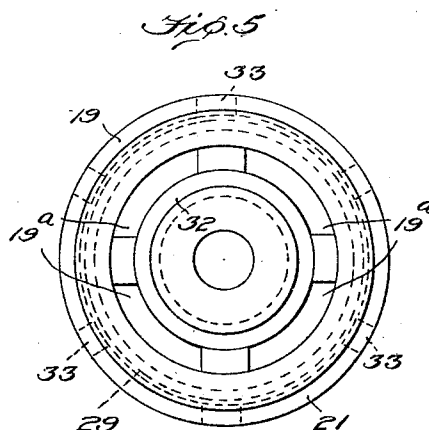
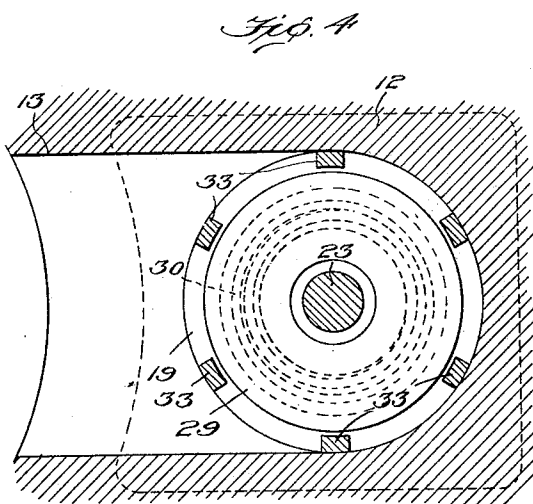
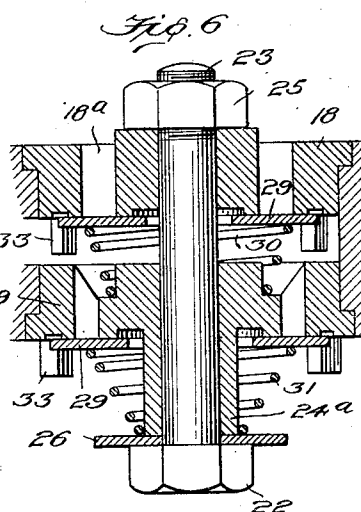
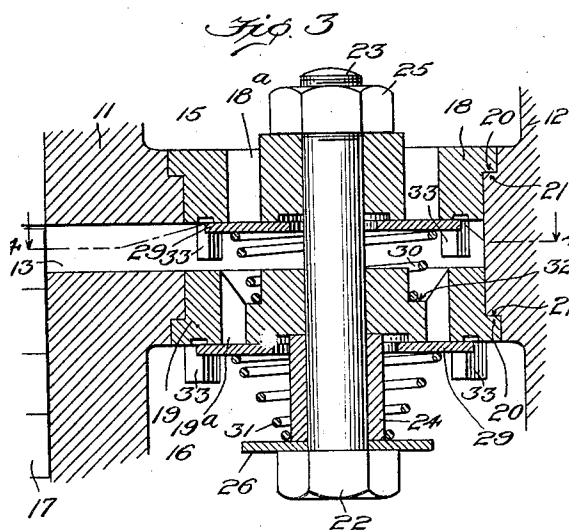
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VALVE MECHANISM FOR FLUID COMPRESSORS

Filed May 13, 1927

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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VALVE MECHANISM FOR FLUID COMPRESSORS

Application filed May 13, 1927. Serial No. 191,258.

This invention relates to improvements in the construction, form and arrangement of valve mechanisms, primarily, while not exclusively, designed for use in connection with fluid compressors.

Amongst the objects of the invention is the simplification of the construction whereby likelihood of the valve mechanism becoming accidentally disarranged or rendered inoperative is eliminated. In the present construction the valve mechanism is such that it may be readily installed in or removed from the valve seat. Again, the mechanism is not only simple in construction but it consists of a comparatively small number of parts all of which are of sturdy construction. Another object is the provision of a novel means for securing the seating members of the valves in the valve chest and in this connection it will be noted that the means for retaining the valve seat members in the chest also serves as a guide for the valves during their movement toward and from their seats.

With these and other objects in view the invention consists in certain novel details of construction and combinations and arrangements of parts all as will hereinafter be more fully described and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawings,—

Figure 1 is a side elevational view of the inlet and discharge end of a fluid compressor cylinder.

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a detail plan view of one of the valve seat members.

Fig. 5 is a plan view of the valve seat member for the exhaust valve.

Fig. 6 is a view similar to Fig. 3, illustrating a modified construction.

As shown in the accompanying drawings, cylinder head 10 of cylinder 11 is preferably provided at one side thereof with a valve chest 12 which communicates with said cylinder through a suction and discharge port 13. As is well understood in the art to which

this invention relates, the valve chest 12 is divided into a pair of compartments 15, 16, and fluid supplied to chamber 15 through a port 14 in the valve chest is adapted to be drawn into cylinder 11 upon movement of the piston in one direction and the burnt gases are returned from said cylinder through port 13 to compartment 16 of the valve chest upon movement of the piston in the opposite direction in cylinder 11. As shown in the present instance the fluid would be drawn into cylinder 11 by suction upon downward movement of the piston 17, while the burnt gases would be discharged from the cylinder during the return upward movement of said piston.

To control the flow of fluid to said cylinder and the discharge of the burnt gases therefrom suitable valves are arranged within the valve chest 12 to control the flow of those elements through ducts or ports by which communication is established between port 13 and the valve chest chambers 15, 16. In the present instance compartments 15, 16 in the valve chest 12 are formed by a pair of valve seat members 18, 19 rigidly, but removably, secured in the interior of said valve chest, member 18 having ports 18a therein through which fluid from compartment 15 has access to port 13 and member 19 having ports 19a therein through which burnt gases discharged through the port 13 may pass to compartment 16 of the valve chest. As far as some aspects of the present invention are concerned these valve members 18, 19 may be secured in the valve chest in various ways but in the preferred embodiment said members are of disk-like formation, having at their perimeter a projecting portion, usually in the form of an annular shoulder 20, the shoulders of the two members being adapted to engage against shoulders 21 formed on the interior of the valve chest wall when the parts are assembled. Said shoulders are so arranged within the valve chest that the two valve seat members will be spaced apart a distance corresponding substantially to the cross sectional dimension of port 13. Near their edges the disk-like valve seat members 18, 19 are formed with the inlet and dis-

charge ducts 18a, 19a, respectively, and at their centers they are bored so that a bolt 23 may be extended therethrough. The end of said bolt 23 projecting into chamber 15 is adapted to receive a nut 25 and interposed between member 19 and enlargement 22 at the opposite end of said bolt is a sleeve 24, a washer 26 being held between said sleeve 24 and enlargement 22. When nut 25 is screwed onto the bolt it will be apparent that the two valve seat members will be firmly clamped against the shoulders 21 on the interior of the valve chest. The upper end of the valve chest is provided with a removable cap 27 affording ready access to compartment 15 to facilitate manipulation of nut 25. Suitable locking means may be provided for locking nut 25 on the bolt. Valve chest 12 has a removable cap 28 at its side affording access to compartment 16 for purposes of assembling the valve seat members and bolt 23.

The valves for ports 18a, 19a, are preferably in the form of disks, such as indicated at 29. The disk valves 29 are formed with central bores through which bolt 23 extends so that said bolt will act as a guide for said valves. Valve 29 for the inlet ports 18a is yieldingly held in engagement with its valve seat member 18 by a spring 30 interposed between said valve and valve seating member 19 while the valve for the discharge ducts 19a is held against seat member 19 by a suitable spring 31 interposed between it and the washer 26 which is carried by bolt 23. If desired, valve seat member 19 may be recessed as at 32 to form a shoulder against which spring 30 abuts, the reduced central portion of said valve seat member preventing lateral play of this spring. Preferably some clearance is provided between bolt 23 and the walls of the central bores in the disk valves 29 and in order to prevent undue lateral movement of said valves guards 33 may be provided on each of the valve seat members and adapted to engage the peripheries of the valves.

In a construction such as described there are a comparatively few parts and all of them are of substantial construction. They are easily installed and there is very little, if any, likelihood of the valve mechanism becoming accidentally disarranged or rendered inoperative. Another feature lies in the fact that bolt 23 which clamps the valve seat members in the valve chest also functions as a guide for the valves 29 in their movement toward and from their valve seats.

In the modification shown in Fig. 6, the sleeve 24 shown in Fig. 3 is omitted and in lieu thereof a sleeve-like extension 24a (Fig. 6) is formed integrally with valve seat member 19.

What I claim is:

1. In a valve mechanism for fluid compres-

sors, a valve chest, inlet and discharge valves in said chest, a valve seat member for each valve, one of said members being removably mounted in the chest, means connecting said members together, said last mentioned means extending through both of said valves and valve guides on each seat member.

2. In a valve mechanism for fluid compressors, a valve chest, a pair of oppositely disposed shoulders on the interior of said chest, valve seat members engaging against said shoulders, inlet and discharge valves operatively associated with said seat members, and means for simultaneously clamping said members against said shoulders.

3. In a valve mechanism for fluid compressors, a valve chest, a pair of oppositely disposed shoulders on the interior of said chest, valve seat members engaging against said shoulders, inlet and discharge valves operatively associated with said seat members, and means for simultaneously clamping said members against said shoulders, said clamping means extending through said valves.

4. In a valve mechanism for fluid compressors, the combination of a valve chest having a suction and discharge port therein, oppositely disposed shoulders on the valve chest wall, valve seat members movable toward each other to seat against said shoulders, securing means for retaining said members against said shoulders, and inlet and discharge valves operatively associated with said valve seat members.

5. In a valve mechanism for fluid compressors, the combination of a valve chest having a suction and discharge port therein, oppositely disposed shoulders on the valve chest wall, valve seat members movable toward each other to seat against said shoulders, inlet and discharge valves operatively associated with said valve seat members, and securing means for holding said valve seat members against said shoulders, said securing means extending through said valves.

6. In a valve mechanism for fluid compressors, the combination of a valve chest having a suction and discharge port therein, oppositely disposed shoulders on the valve chest wall, valve seat members movable toward each other to seat against said shoulders, inlet and discharge valves operatively associated with said valve seat members, and a bolt extending through said members for clamping them against said shoulders, said bolt extending through said valves.

7. In a valve mechanism for fluid compressors, a valve chest, a pair of valve seat members in said chest, inlet and discharge valves operatively associated with said seat members, means for securing said seat members in said chest, said securing means extending through said valves, and valve guides formed on said seat members.

8. In a valve mechanism for fluid compres-

sors, a valve chest, a pair of valve seat mem-
bers in said chest, a bolt extending through
and removably holding said members in said
chest, inlet and discharge valves operatively
associated with said valve seat members, said
5 bolt extending through said valves, and valve
guides formed on said valve seat members.

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