

April 12, 1932.

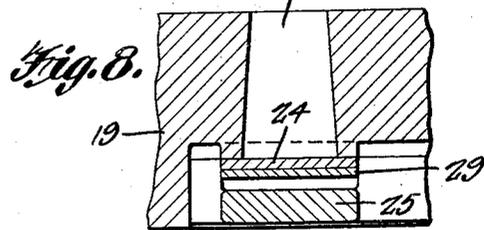
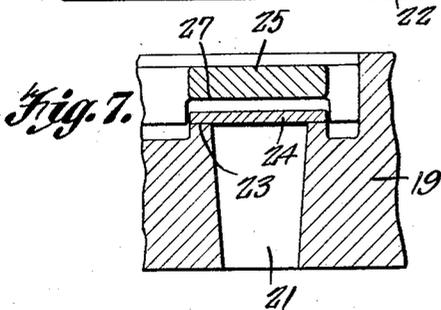
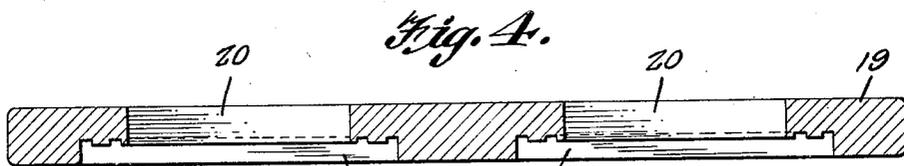
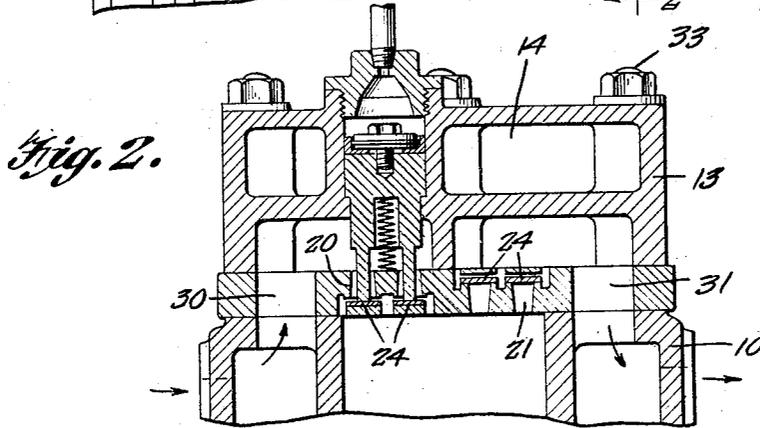
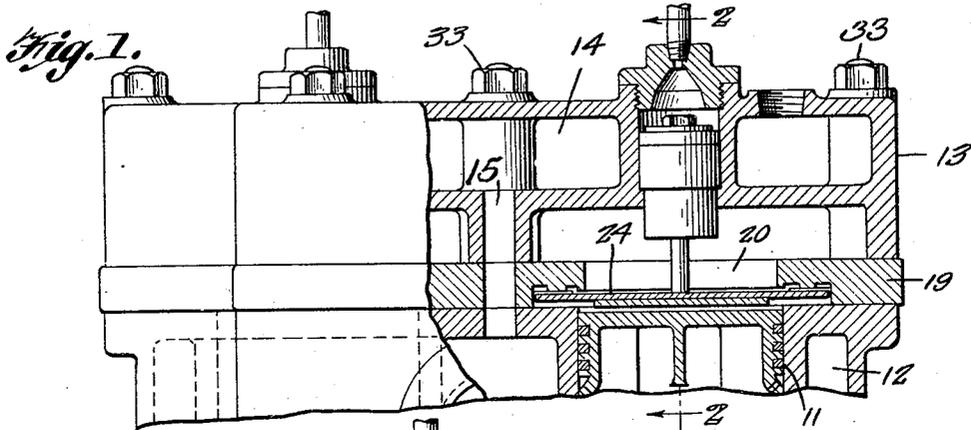
C. WAINWRIGHT

1,854,085

COMPRESSOR VALVE UNIT

Filed April 25, 1930

2 Sheets-Sheet 1



*P. Hickey.*

WITNESS:

Charles Wainwright,  
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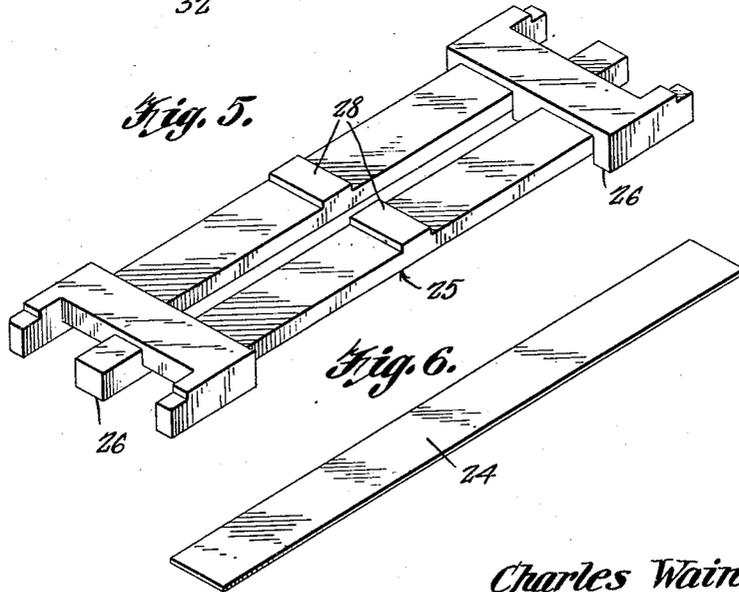
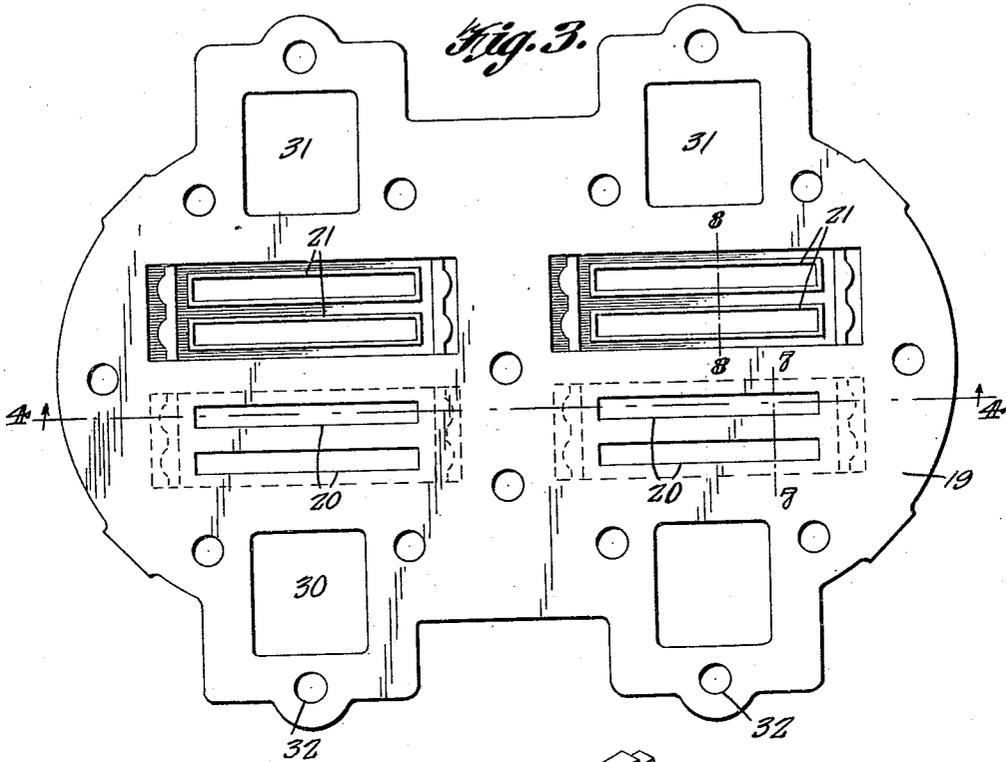
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C. WAINWRIGHT  
COMPRESSOR VALVE UNIT

1,854,085

Filed April 25, 1930

2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

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## COMPRESSOR VALVE UNIT

Application filed April 25, 1930. Serial No. 447,315.

This invention relates to air compressors and has a special reference to inlet and exhaust valves therefor, the invention being designed especially for application to water cooled vertical compressors.

An object of the present invention is to provide a valve unit which is detachably secured in place and which includes inlet and exhaust ports, together with openings to provide for a circulation of water around the compressor cylinder and the cylinder head.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a fragmentary view partly in section of the upper portion of a vertical air compressor, illustrating the invention.

Figure 2 is a section taken substantially on the line 2—2 of Figure 1.

Figure 3 is a plan view of the valve head.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a perspective view of one of the retainers for the discharge valves.

Figure 6 is a like view of one of the valve plates.

Figures 7 and 8 are enlarged sections taken respectively on the lines 7—7 and 8—8 of Figure 3, with the valve plates in position.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the reference character 10 indicates a portion of a compressor frame or block which includes a pair of cylinders 11. While two cylinders are illustrated, it is apparent that the compressor may include one or any number of cylinders. The cylinders are provided with a water jacket 12 for cooling purposes.

The reference character 13 indicates the cylinder head and this head is likewise provided with a water jacket 14 which opens through the inner face of the head and communicates with the water jacket of the cylinder as shown at 15. The head is removably

secured to the compressor frame or block by means of bolts or studs 33.

Each of the cylinders is provided with inlet and exhaust valves, and in order to simplify the compressor structure and provide convenient means for assembling and repair, these valves are arranged so that they may be removed and replaced as a unit, whether the compressor is of a single or multi-cylinder type. For this purpose the invention provides a valve head 19, which carries the valves. This head is provided with inlet and discharge ports 20 and 21 respectively, which are surrounded by recesses 22. The ports 20 and 21 are provided with seats 23 having valve plates 24. One of these plates is illustrated in Figure 6 of the drawings and is adapted to be positioned in contact with the seat 23 when the port is closed.

Located within the recess 22 of the valve head 19 are valve retainers 25. One of these retainers for the discharge valves is shown in detail in Figure 5 of the drawings. One of these retainers fits within each of the recesses 22 over or under each pair of ports. The retainers are provided with longitudinally disposed lugs 26 which are spaced transversely and between which the valve plates 24 are positioned. Limited movement of the valve plates 24 between the ports 23 and the opposed faces 27 of the valve retainers is thus provided. Thus, when the valve plates are unseated, air may pass through the ports past the longitudinal side edges of the retainers. In the valve retainers for the inlet ports, the bosses 28 are omitted.

These bosses are omitted for the purpose of accommodating a valve spring 29, which acts to normally seat the valve plates 24 of the inlet ports.

Air is admitted to the ports 20 through passages 30 as shown by the arrows in Figure 2 of the drawings, and passes outward from the discharge ports 21 through passages 31, also indicated by arrows in the said figure.

The valve head is provided with openings 32 for the passage of bolts or studs 33, and as these bolts or studs serve to secure the cylinder head 13 in place, they likewise provide for securing in place the valve unit

The head 19 shown in the drawings is for a two-cylinder compressor, and carries the inlet and exhaust valves for both cylinders. Obviously, the construction may be applied to a single or multi-cylinder compressor, so that the valves of all of the cylinders may be arranged as a single unit.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:—

1. A compressor valve structure comprising a flat head plate having ports passing therethrough, said ports being surrounded by recesses in the faces of the plate, valve retainers seated in the recesses and having solid portions disposed opposite the ends of the ports and spaced therefrom and flat parallelepiped valve members disposed in the spaces between the ends of the ports and the solid portions of the retainers, said valve plates being less in transverse thickness than the transverse width of the spaces.

2. A compressor valve structure comprising a flat head plate having ports passing therethrough, said ports being surrounded by recesses in the faces of the plate, valve retainers seated in the recesses and having solid portions disposed opposite the ends of the ports and spaced therefrom and flat parallelepiped valve members disposed in the spaces between the ends of the ports and the solid portions of the retainers, said valve plates being less in transverse thickness than the transverse width of the spaces and the retainers having spaced lugs located at their sides and which snugly receive the end portions of the valve members.

3. In a compressor valve a retainer comprising an elongated body provided at its ends and at its opposite edges with spaced lugs, said body being provided at a point midway between its ends with a transversely disposed boss, the boss being located at the opposite side of the body from the lugs and a parallelepiped valve member adapted to fit snugly at its ends between the lugs.

In testimony whereof I affix my signature.  
CHARLES WAINWRIGHT.

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