

Feb. 28, 1928.

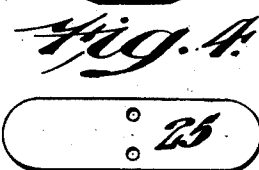
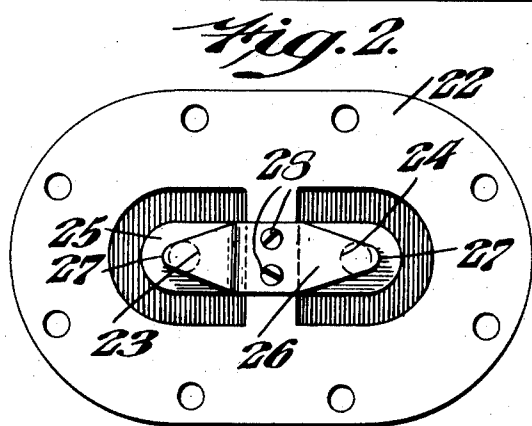
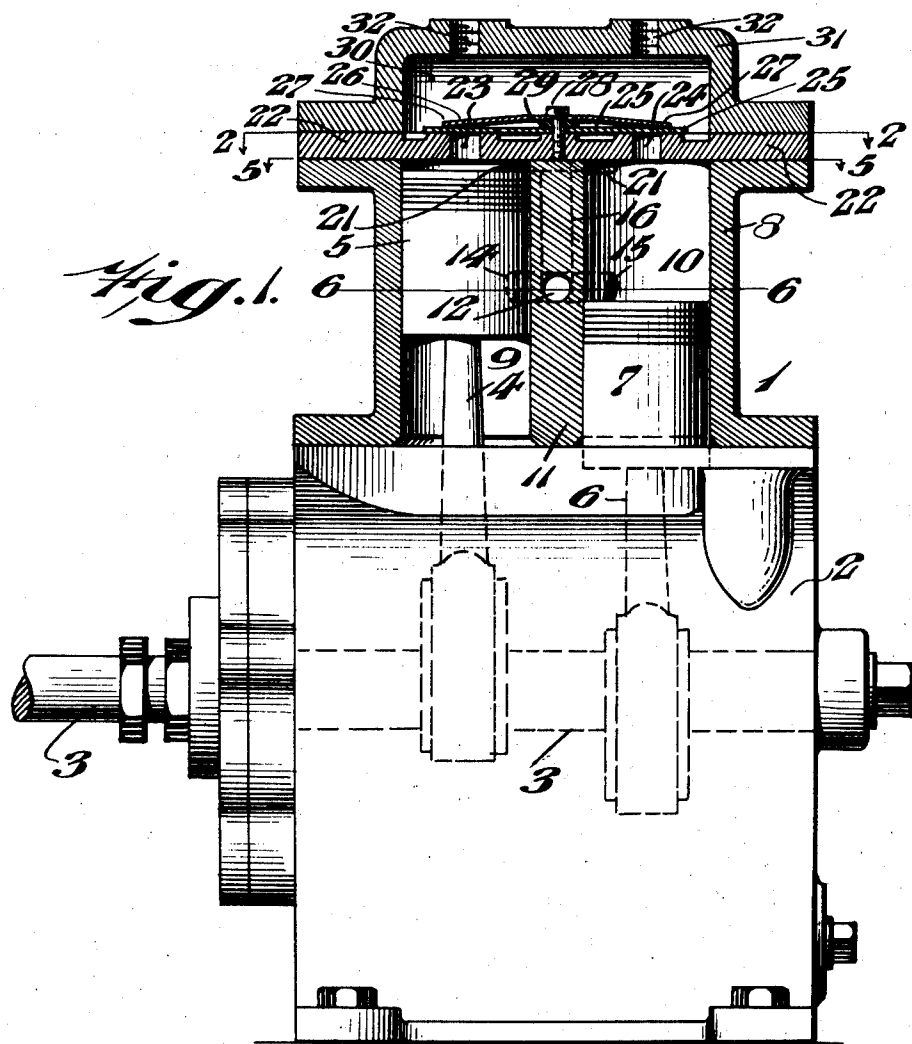
1,661,148

J. F. WINKLER

COMPRESSOR

Filed May 3, 1927

2 Sheets-Sheet 1



INVENTOR:
Joseph F. Winkler.
BY
Wiederhoeft & Co.
ATTORNEYS.

Feb. 28, 1928.

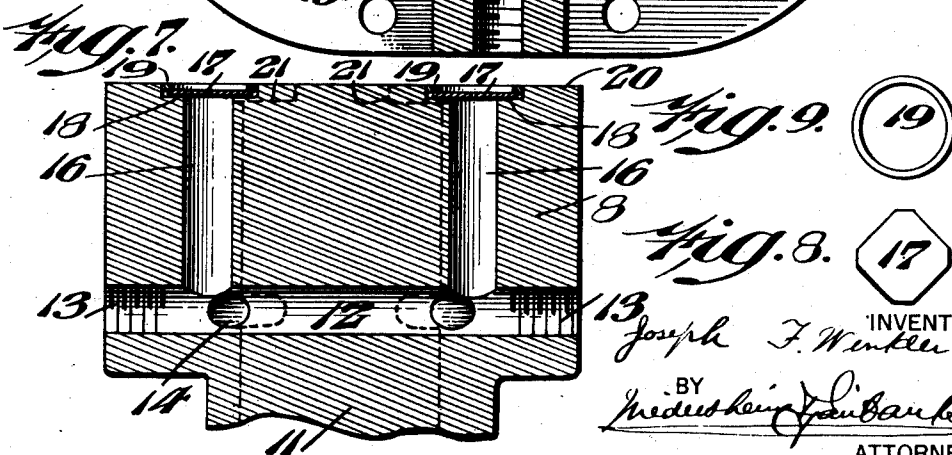
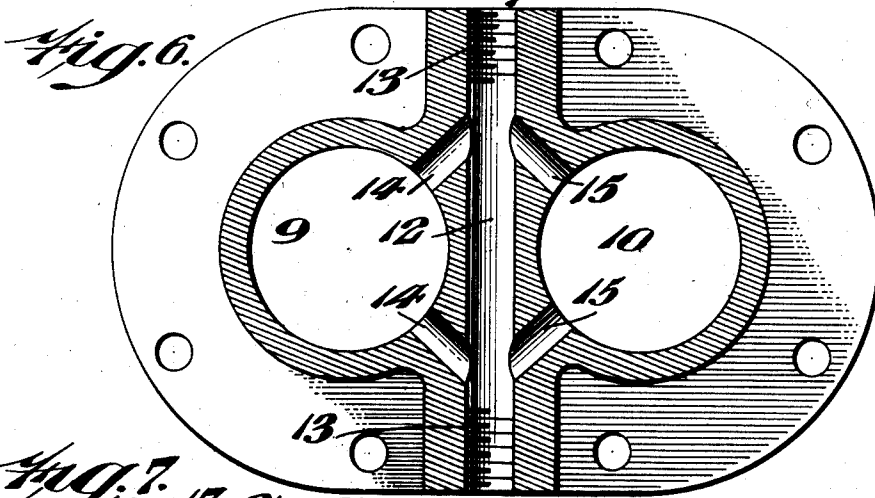
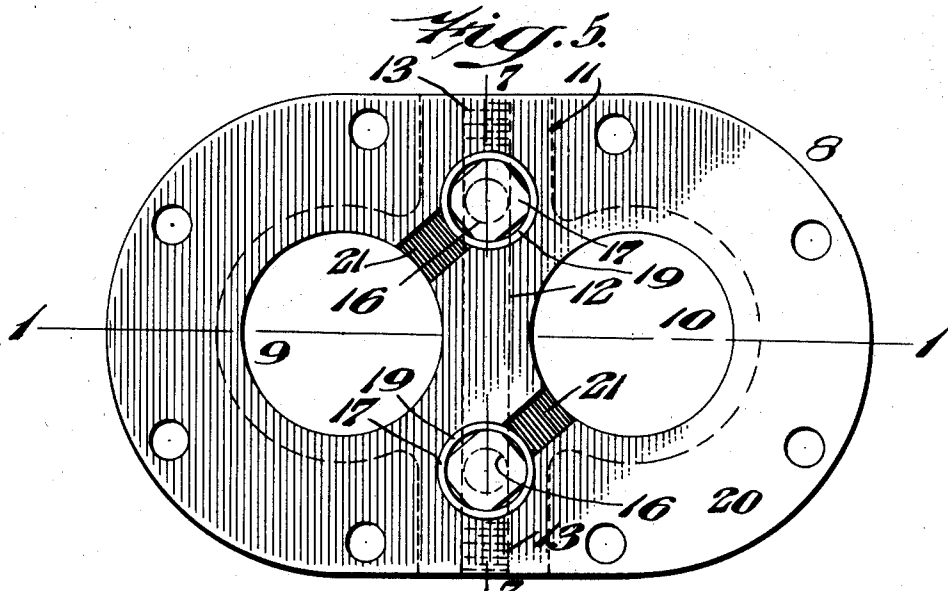
J. F. WINKLER

1,661,148

COMPRESSOR

Filed May 3, 1927

2 Sheets-Sheet 2



INVENTOR:
Joseph F. Winkler
BY
Widesshain & Banks
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH F. WINKLER, OF PHILADELPHIA, PENNSYLVANIA.

COMPRESSOR.

Application filed May 3, 1927. Serial No. 188,430.

My invention relates to a novel construction of a compressor adapted generally for compressing air, gases, and other fluids, but more particularly adapted for use in connection with refrigeration apparatus and the like.

My invention more particularly relates to a novel arrangement and collocation of the suction passages, ports and valves, whereby a very effective and compact compressor is produced which is adapted to a variety of uses.

To the above ends, my invention consists of a novel construction of a cylinder block having formed therein a horizontally extending suction passage threaded at its outer ends whereby connection can be readily made at either end to a source of supply, said horizontal passage communicating by laterally extending ports with the piston chambers of the cylinder block at points coincident with the tops of the lowest portion on the down stroke and having vertically extending passages controlled by suction valves, there being also an upper plate containing spring pressed discharge valves, above which is the discharge chamber and a cap therefor, whereby a very compact and efficient compressor is produced.

Other novel features of construction will be hereinafter described and finally claimed.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

Fig. 1 represents a vertical sectional view of a compressor embodying my invention, certain portions being shown in elevation, and the section being taken on line 1—1 of Fig. 5.

Fig. 2, represents a plan view of the discharge valve plate and the valve and spring carried thereby, said view being taken on line 2—2 of Fig. 1.

Figs. 3 and 4 represent plan views of the discharge valve spring and discharge valve respectively in detached position.

Fig. 5, represents a plan view of the top

of the cylinder block showing the suction valves and their coacting ports and passages, said Fig. 5 being taken on line 5—5 of Fig. 1.

Fig. 6, represents a horizontal section on line 6—6 of Fig. 1.

Fig. 7, represents a vertical section on the line 7—7 of Fig. 5.

Figs. 8 and 9 represent plan views of a suction valve and its retaining ring respectively in detached position.

Similar numerals of reference indicate corresponding parts.

1 designates my novel construction of compressor, the same comprising the lower housing 2, within which the crank shaft 3 has its bearings, said shaft actuating the connecting rods and pistons 4, 5, 6, and 7 respectively, the foregoing parts being of the usual construction. The cylinder block 8 and the suction passages therein to which my invention particularly relates, comprise an outer casing having piston chambers 9 and 10 for the pistons 5 and 7 respectively, and in the central web 11 of said cylinder block is formed the horizontal suction passage 12, which is internally threaded at its outer ends as indicated at 13, so that a suction pipe can be readily attached to either end of the passage 12. 14 designates laterally extending ports leading from the suction passage 12 to the piston chamber 9. 15 designates similar laterally extending ports leading from the suction passage 12 to the piston chamber 10. The horizontal suction passage 12 and the lateral suction ports 14 and 15 respectively leading therefrom are positioned so that said ports 14 and 15 are about coincident with the top of the pistons 5 and 7 when the latter reach their extreme downward stroke, as will be understood from Fig. 1. 16 designates vertically extending passages, whose lower ends communicate with the horizontal suction passage 12 and whose upper ends are closed or controlled by the suction valves 17 which are preferably of square or polygonal form as will be understood from Figs. 5 and 8.

The valves 17 are supported on the valve seats 18 and are held in position by the rings 19, see Fig. 7, said rings being flush with the top 20 of the cylinder block 8. 21 designates recesses leading tangentially from the upper portions of the piston chambers 9 and 10 to the vertical passages 16 as will be understood from Figs. 1, 5, and 7.

22 designates the discharge valve plate which is provided with the oppositely located ports 23 and 24 which communicate with the tops of the piston chambers 9 and 10 respectively. 25 designates a discharge valve, which in the present instance is in the form of a reed valve whose outer ends seat upon the valve plate 22 above the ports 23 and 24, said reed valve being resiliently held in position by the spring 26 which is slightly bowed, as will be understood from Fig. 1, so that its outer ends 27 bear upon the outer portion of the reed valve 25. The spring 26 is held in position by a plurality of screws, or other fastening devices 28 which pass through the central portion of the spring and the reed valve. The said spring and reed valve are separated by the bar 29, as will be understood from Fig. 1. 30 designates a discharge chamber formed with a cap 31 which latter is provided with the threaded outlets 32, to which outlets the discharge device may be connected. The discharge valve plate 22 and the cylinder block 8 are each provided with flanges whereby these parts can be readily bolted to either or held in assembled position by any suitable means, the cylinder block 8 being bolted or otherwise secured, by any suitable means, to the housing.

The operation is as follows, reference being had to Fig. 1:

As the piston 5 descends from its highest position to its lowest position the gas or other fluid will be sucked through the suction passage 12 and one of the vertical passages 16 until the piston 5 reaches its extreme downward position, it being understood that as the piston 5 moves downwardly the discharge valve which controls the port 23 will remain seated. As the piston 5 moves downwardly from the position seen in Fig. 1 the piston 7 moves upwardly towards the port 24 and after it passes the port 15 the gas will be compressed and forced through the port 24 into the discharge chamber 30, and thence out through the ports 32 to the desired point, it being understood that while the piston 7 moves upwardly that the portion of the discharge valve 35, covering the port 24, is seated, thereby permitting the egress of the compressed gas through the port 24 into the discharge chamber 30. At this time the piston 7 is in its highest position and the piston 5 is in its lowest position, whereupon the above described cycle of operation is repeated, as is evident to those skilled in the art.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown and described the preferred embodiment thereof

which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a compressor of the character stated, a cylinder block provided with piston chambers and pistons therein, a horizontally disposed suction passage positioned between said pistons and having suction ports leading therefrom positioned so as to align with the tops of the pistons when the latter reach the downward limit of their stroke, vertical suction passages leading from said horizontal passages, said vertical passages opening into the top of the piston chambers, suction valves positioned upon the tops of said vertical passages, discharge ports upon the tops of said piston chambers, and discharge valves controlling said ports.

2. In a compressor of the character stated, a cylinder block provided with piston chambers and pistons therein, a horizontally disposed suction passage positioned between said pistons and having suction ports leading therefrom positioned so as to align with the tops of the pistons when the latter reach the downward limit of their stroke, vertical suction passages leading from said horizontal passages, said vertical passages opening into the top of the piston chambers, said piston chambers and said horizontal suction passage being connected by lateral passages, suction valves positioned upon the tops of said vertical passages, discharge ports upon the tops of said piston chambers and discharge valves controlling said ports, said discharge valves comprising a spring pressed reed whose ends control said discharge ports.

3. In a compressor of the character stated, a cylinder block provided with piston chambers and pistons therein, a horizontally disposed suction passage positioned between said pistons and having suction ports leading therefrom positioned so as to align with the tops of the pistons when the latter reach the downward limit of their stroke, vertical suction passages leading from said horizontal passages, said vertical passages opening into the top of the piston chambers, recesses leading tangentially from the upper portions of said piston chambers to said vertical passages, suction valves positioned upon the tops of said vertical passages, discharge ports upon the tops of said piston chambers and discharge valves controlling said ports, said discharge valves comprising a spring pressed reed whose ends control said discharge ports.

JOSEPH F. WINKLER.