

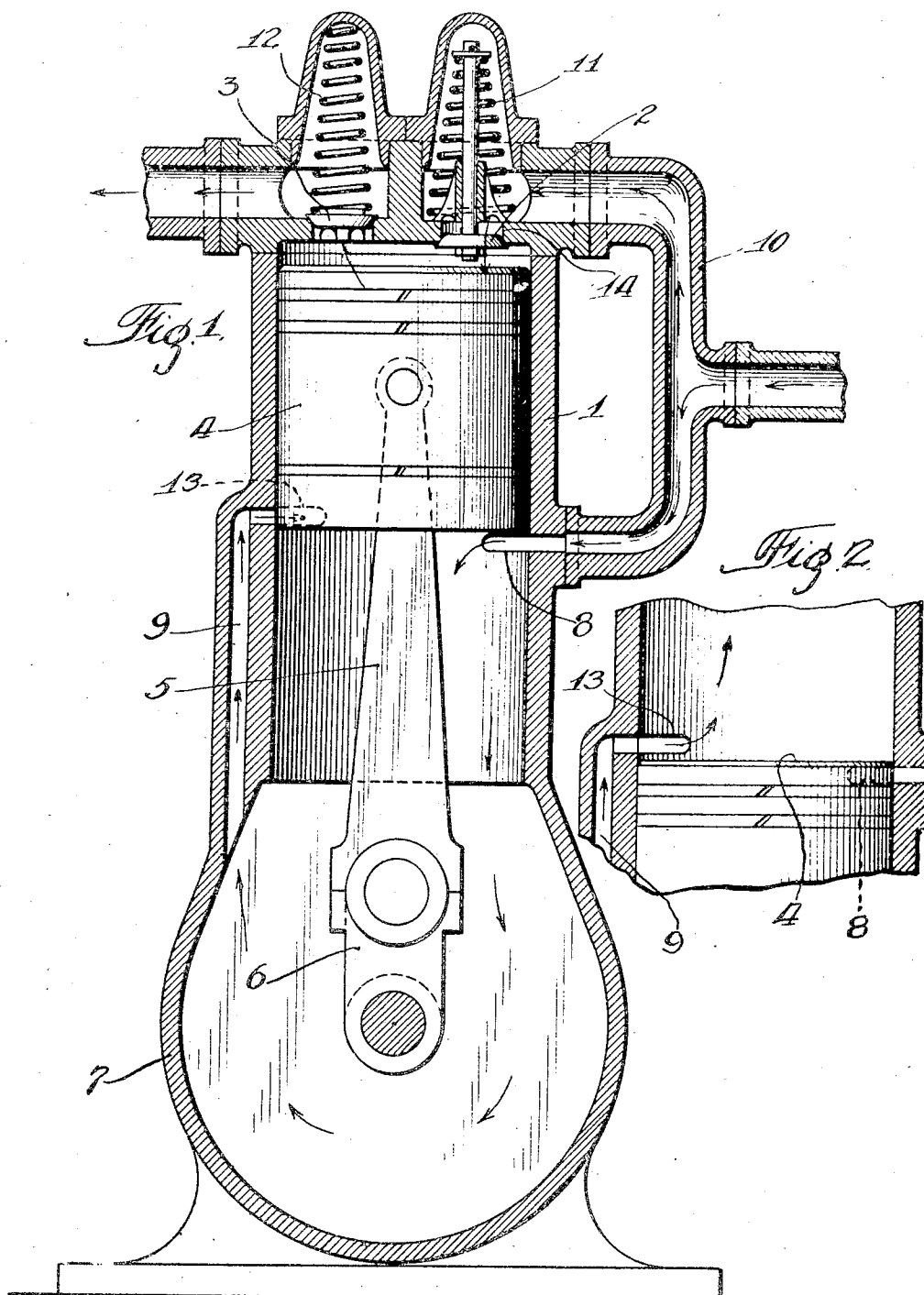
Dec. 13, 1932.

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1,891,083

AIR COMPRESSOR

Filed Oct. 18, 1928



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AIR COMPRESSOR

Application filed October 18, 1928. Serial No. 313,213.

My invention relates to air compressors.

One of the objects of my invention is to increase the capacity of a compressor without increasing the cost materially.

5 A further object is to increase the thermal efficiency of a compressor.

A further object is to provide a compressor which will be particularly advantageous in refrigeration systems.

10 Further objects will appear from the description and claim.

In the drawing, in which an embodiment of my invention is shown,

15 Fig. 1 is a vertical section through an air compressor; and

Fig. 2 is a section of part of the cylinder in the same plane as that of Fig. 1 but showing the piston in its lowermost position.

20 In carrying out my invention I utilized the crank case of the compressor as a precompressor chamber.

Referring to the drawing in detail, the construction shown therein comprises a cylinder 1 having inlet valve 2 and outlet valve 3, a 25 piston 4 operating in said cylinder 1, a connecting rod 5 for operating said piston, a crank 6 for actuating the connecting rod, a fluid-tight crank case 7 for the crank 6, a port 8 for supplying fluid to the crank case chamber to be precompressed therein, a passage 9 for the fluid from the crank case chamber to the cylinder above the piston and a manifold 10 for supplying fluid both to the 30 cylinder above the piston and to the crank case chamber below the piston.

35 The inlet valve has a light spring 11 which will allow the valve 2 to open easily to admit fluid above the piston as the piston moves downwardly. The exhaust valve 3 is provided with a light spring 12 which permits 40 the fluid to be exhausted past it as the piston moves upward. The inlet port 8 to the crank case is so positioned that it is closed except when the piston is in its extreme upper position, as shown in Fig. 1, and the port for the 45 connecting passage 9 is so positioned that it is closed by the piston except that when the piston is in its extreme lower position, as shown in Fig. 2.

50 With this construction, when a piston is

in its upper position fluid will be supplied to the crank case chamber at substantially the same pressure as exists in the manifold. As the piston moves downward the inlet port 8 55 is almost immediately cut off from the fluid supply port and thereafter the fluid is compressed in a crank case chamber until the piston reaches its lowermost position, as shown in Fig. 2. During this downward 60 movement of the piston fluid has been supplied to the cylinder above the piston past the lightly held inlet valve 2 so that just before the piston uncovers the port the pressure in the cylinder above the piston will be substantially that in the manifold 10. 65

As soon, however, as the piston uncovers the port 13 of the connecting passage 9 fluid will rush from the crank case chamber to the cylinder above the piston until the pressure is 70 equalized. Shortly thereafter the piston begins its upward movement and the precompressed fluid above the piston is forced out past the exhaust valve 3 into any suitable reservoir or compressed fluid system, the inlet valve 2 acting as a check or nonreturn 75 valve during this movement.

It will be noted that the inlet port 14 to the cylinder and the inlet port 8 to the crank case are both connected with the same manifold 10. 80

This construction is of special advantage in certain types of refrigeration systems in which the fluid to be compressed must be in a closed system.

85 While I have shown but one form of my invention, various other forms will occur to those skilled in the art and consequently this invention is to be limited only by the scope of the appended claim and the prior art.

I claim:

90 A fluid compressor, comprising a cylinder, a piston operating in said cylinder, a connecting rod pivotally connected with said piston for actuating it, a crank for actuating said connecting rod, and a fluid-tight crank case 95 for said crank, the effective length of said cylinder being substantially twice the length of the crank throw and the effective length of said piston being substantially one-half the effective length of the cylinder, said cylin- 100

der having inlet and outlet ports for the space
at the outer end of the cylinder, and having
an inlet port just closed by the outer edge of
the piston when the piston is in its inner posi-
5 tion and another port just closed by the in-
ner edge of the piston when the piston is in
its outer position, a conduit affording com-
munication between the crank case and said
last port, and a manifold for supplying both
10 said inlet ports.

In witness whereof, I have hereunto sub-
scribed my name.

ADIEL Y. DODGE.

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