April 14, 1925

1,533,958

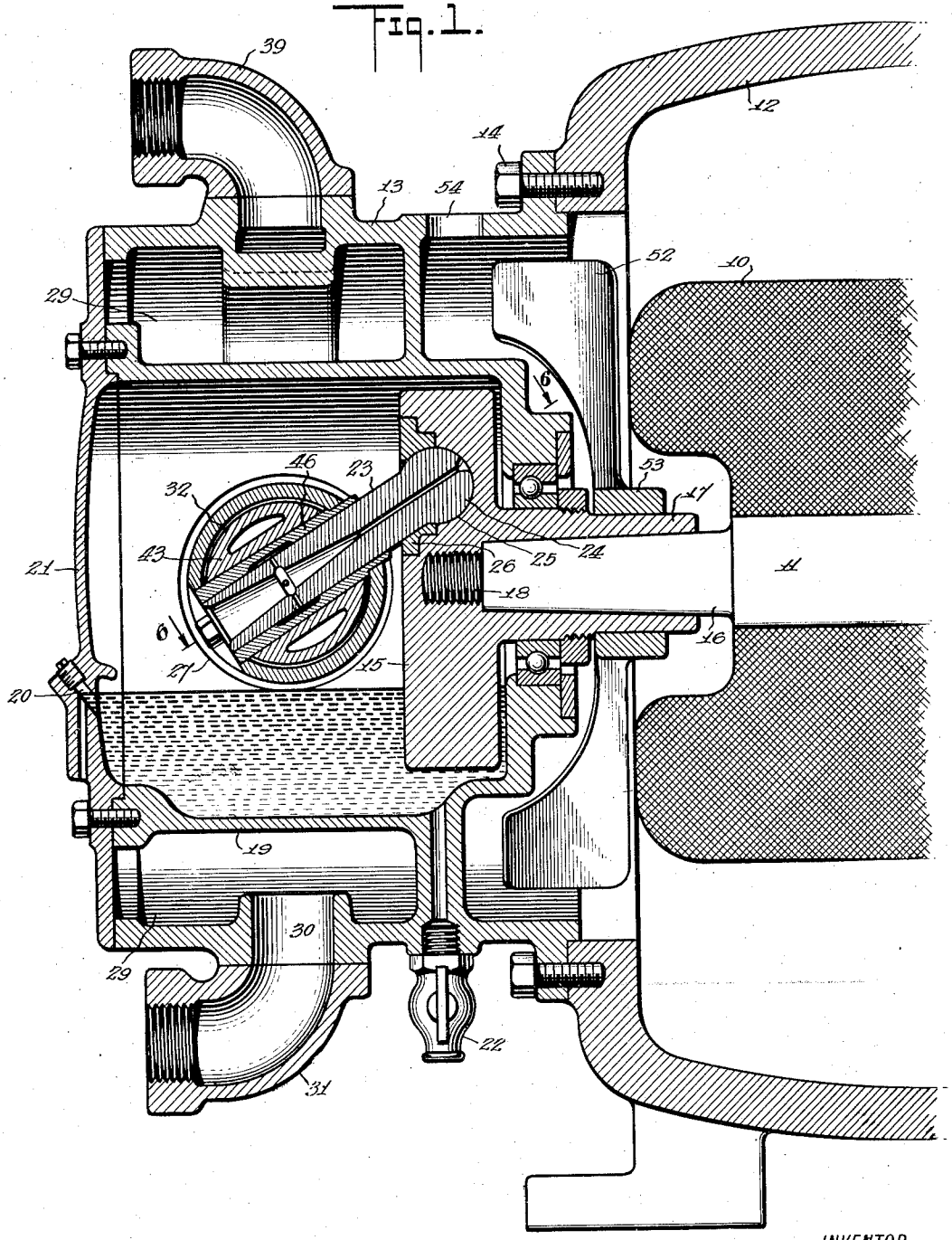
C. M. TURSKY

AIR COMPRESSOR

Filed April 23, 1924

3 Sheets-Sheet 1

Fig. 1.



WITNESSES

Frank T. Paggane

J. L. Whitcliffe

INVENTOR

CHARLES M. TURSKY.

BY Munn & Co

ATTORNEYS

April 14, 1925. 1,533,958

C. M. TURSKY

AIR COMPRESSOR

Filed April 23, 1924 3 Sheets-Sheet 2

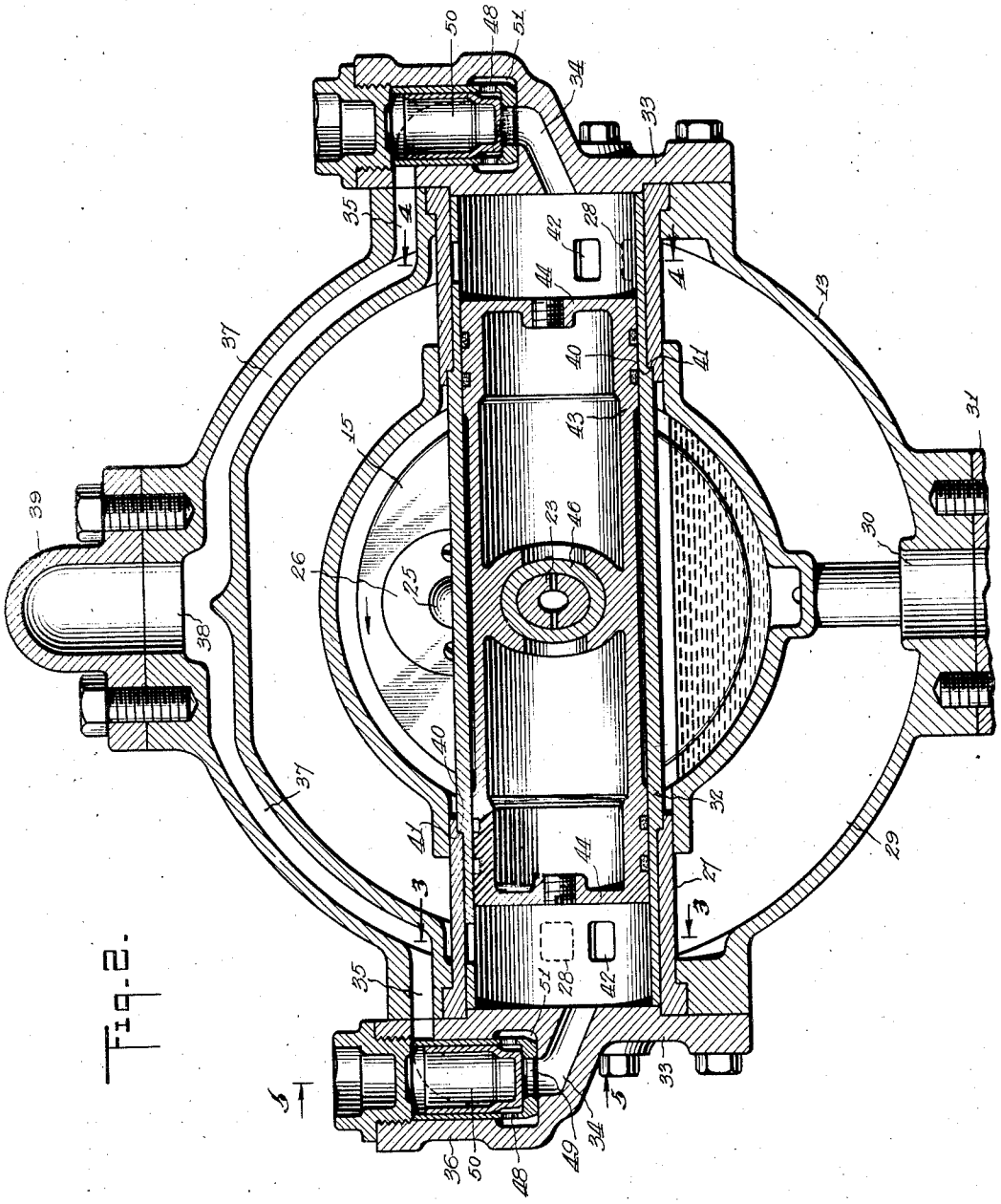


Fig. 2.

WITNESSES

Frank J. Faggiani

J. L. Wardlaw

INVENTOR

CHARLES M. TURSKY.

BY Munn & Co

ATTORNEYS

April 14, 1925. 1,533,958

C. M. TURSKY

AIR COMPRESSOR

Filed April 23, 1924 3 Sheets-Sheet 3

Fig. 3

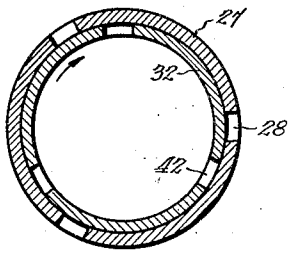


Fig. 4.

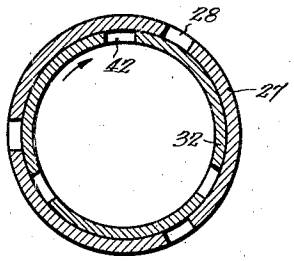


Fig. 5.

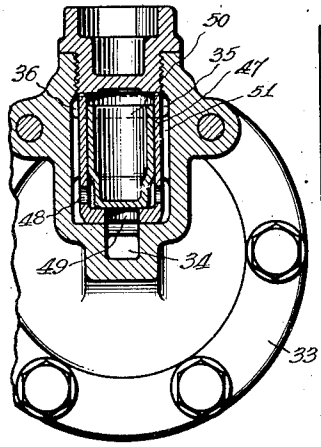


Fig. 7.

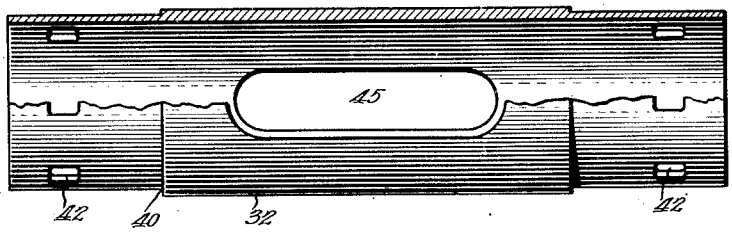
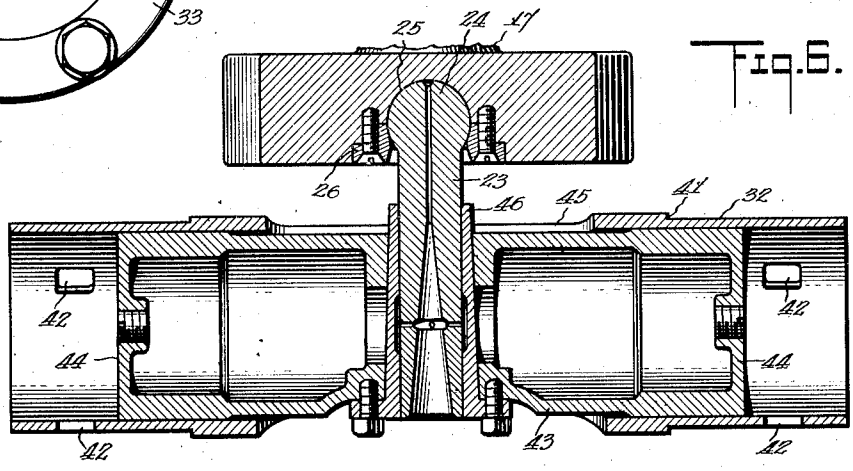


Fig. 6.



WITNESSES

Frank L. Piggins

J. W. Cunliffe

INVENTOR

CHARLES M. TURSKY.

BY Munn & Co.

ATTORNEYS

Patented Apr. 14, 1925. 1,533,958

UNITED STATES PATENT OFFICE.

CHARLES M. TURSKY, OF NEW YORK, N. Y.

AIR COMPRESSOR.

Application filed April 23, 1924. Serial No. 708,515.

To all whom it may concern:

Be it known that I, CHARLES M. TURSKY, a citizen of the United States of America, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Air Compressor, of which the following is a description.

My invention relates to an air compressor and more particularly to an air compressor and electric motor assemblage in which the casing of the compressor is secured directly to the stator or casing of the electric motor and in which the piston is given rocking and reciprocating movement, a cylindrical valve controlling the inlet of air in front of the opposite ends of the piston.

The general object of my invention is to improve compressors of the general type indicated whereby to promote efficiency as well as simplicity and convenience of assemblage and control.

A further object is to provide for effectively cooling the motor by providing a fan adapted to have a cooling action on the motor and compressor.

Reference is to be had to the accompanying drawings forming a part of this specification, it being understood that the drawings are merely illustrative of one example of the invention.

Figure 1 is a longitudinal vertical section of a compressor embodying my invention including a showing of a portion of the motor casing and rotor and showing the connection between the motor shaft and the compressor;

Figure 2 is a transverse vertical section;

Figures 3, 4 and 5 are cross sections respectively, on the lines 3—3, 4—4 and 5—5 in Figure 2;

Figure 6 is a longitudinal section of a motor and the sleeve valve forming the cylinder for the piston and including the actuating means for reciprocating and turning the piston and for turning the said cylinder;

Figure 7 is a view partly in section and partly in side elevation of the combined sleeve valve and cylinder.

In the illustrated example of my invention the numeral 10 indicates an end of a rotor of an electric motor; 11, an end of the motor shaft; and 12, the casing or stator of the electric motor. In accordance with my invention the casing 13 of the compressor is secured directly to the casing 12 by screw bolts 14.

A revoluble drive element advantageously in the form of a disk 15 is secured to the spindle or tapered end 16 of the motor shaft 11 through the medium of a hub sleeve 17 integral with the disk 15 and by a reduced threaded terminal 18 on said spindle 16. Within the compressor casing 13 is a box 19 in which the actuating head and the piston assemblage turn and which box is adapted to receive oil through an inlet 20 in a cover 21, the numeral 22 indicating a drain cock for draining the oil from the box 19. A drive element 23 is connected with the disk 15 by a universal connection, there being a ball head 24 on said element 23 and held in a socket 25 in the disk 15 through the medium of a cap 26 forming jointly with the socket 25 a bearing for the ball head 24.

In the casing 13 as best shown in Figure 2 is fitted alined and spaced cylinders 27 having air inlet openings 28 to receive air from an air chamber 29 having an inlet 30 supplied by an elbow or other fitting 31 which in practice may be connected with a pipe (not shown) to take air from any point desired.

A combined sleeve valve and cylinder 32 is fitted at its ends in the fixed cylinders 27 and is adapted to have a limited turning movement in said cylinders as will appear.

The valve 32 is held against longitudinal movement by reason of opposed shoulders 40, 41 on said valve and on the cylinders 27 respectively and by reason of said valve abutting directly against heads 33 closing at the outer ends of the cylinders 27. An outlet port 34 is provided in each head 33 and leading from the head is an outlet port 35 in the casing 13, said port 35 leading to an outlet passage 37 to direct the compressed air to an outlet hole 38 communicating with an elbow 39 or other fitting to connect with a delivery pipe (not shown). Communication between outlet ports 34, 35 is controlled by an outlet valve designated generally by the numeral 36 which automatically passes the compressed air on the compression stroke of the piston as will appear.

In the valve 32 are inlet ports 42 adapted by the turning of the valve to be alternately brought into and out of register with the ports 28, said ports 28, 42 at the respective

ends of the valve 32 being relatively so positioned that said ports 28, 42 at one end of the valve 32 will be in register while at the opposite ends said ports will be out of register. The interior of the valve 32 is at all times open at both ends for communication with the respective outlet ports 34 for the compressed air.

A piston 43 is adapted to have imparted thereto by the drive element 23 a reciprocating movement in the combined valve and cylinder 32 and relatively to the fixed cylinders 27. Said piston 43 has a head 44 at each end for compression the heads alternately having a compressing stroke, the one compressing while the other has movement to draw in the air through the ports 28, 42.

It will be seen that at each end of the piston the cylinder head 33 is equipped with an outlet valve (36) only, said valve communicating with the outlet for the compressed air from the compressor; and adjacent to each end the cylinders 27 and the combined cylinder and valve 32 coact to draw in the air to be compressed and discharged past the outlet valve 36. The valve 32 has a longitudinal slot 45 in a side thereof through which the actuating element 23 extends. A bushing 46 is fitted transversely in the valve 32 and in the piston 43, in which bushing 46 the actuating element 23 has a snug fit to have longitudinal movement in response to the turning of the disk 15. The action of the element 23 on the piston 43 is to give it longitudinal reciprocating movement relatively to the valve 32, the slot 45 affording clearance for the longitudinal movement of said piston 43 and the element 23. In addition a turning movement is imparted jointly to the piston 43 and to the valve 32 for controlling the inlet of air through the ports 28, 42.

Each outlet valve 36 has a cup-shaped shell 47 therein and spaced from the walls of the valve body for the passage of air. Said shell has outlet ports 48 in the sides thereof. Said shell 47 has an inlet 49 communicating with the outlet port 34. Within the shell 47 is a hollow piston valve 50 which is permitted limited longitudinal movement to unseat itself from the inlet port 49 establishing communication between said inlet port 49 and the lateral ports 48 which lead to air space 51 between the valve body and the shell 47. Hence at each compression stroke the valve 50 will unseat and permit flow of the compressed air through the ports 49, 48 and through the passage 51 to the outlet port 35 and passages 37, 38.

In order to cool the motor and compressor I provide a fan 52 disposed adjacent to the joint between the compressor casing 13 and the motor casing 12. Said fan 52 is arranged to be driven by the motor shaft 11 for which purpose in the illustrated example the hub 53 of said fan is shrunk upon or otherwise made fast to the hub 17 of the drive element 15. Air holes 54 are formed in the compressor casing 13 adjacent to the fan.

I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention, I do not limit myself strictly to the exact details herein illustrated, since, manifestly, the same can be considerably varied without departure from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. An air compressor comprising end cylinders, a cylindrical valve turnable relatively to said cylinders, a piston in said valve, actuating means to give reciprocating movement to the piston in said valve and to give turning movement jointly to the piston and valve, and means to alternatively admit air to said valve and to permit escape of the air at both ends of the valve with the reciprocation of the piston.

2. An air compressor comprising a turnable cylindrical valve, a piston in said valve, means to reciprocate the piston in the valve and to jointly give turning movement to the piston and the valve, means to admit air to the valve alternatively at each end thereof in front of the piston by the turning of said valve and with the reciprocation of the piston, and means to discharge the compressed air from each end of the valve.

3. An air compressor including end cylinders, heads thereon, a cylindrical valve adapted to turn in said cylinders and held against reciprocating movement, a piston in said valve, means to reciprocate the piston in the valve and to jointly turn the valve and piston, means to admit air to each end of the valve alternately, and means associated with said cylinder heads to afford outlet for the compressed air.

4. An air compressor comprising a casing having an air chamber provided with an air inlet, end cylinders, a cylindrical valve turnable relatively to said cylinders but held against reciprocating movement, a piston in said valve, said valve and said cylinders having air ports adapted to be alternately brought into and out of register at the respective ends of the valve, means to impart reciprocating movement to the piston in the valve and to jointly turn the piston and valve relatively to the cylinders, said ports communicating with said air chamber, heads on the cylinders, and discharge valves on said heads adapted to unseat on the compression stroke and to seat on the suction stroke of the piston relatively to a given end of the valve.

CHARLES M. TURSKY.