F. PECK.

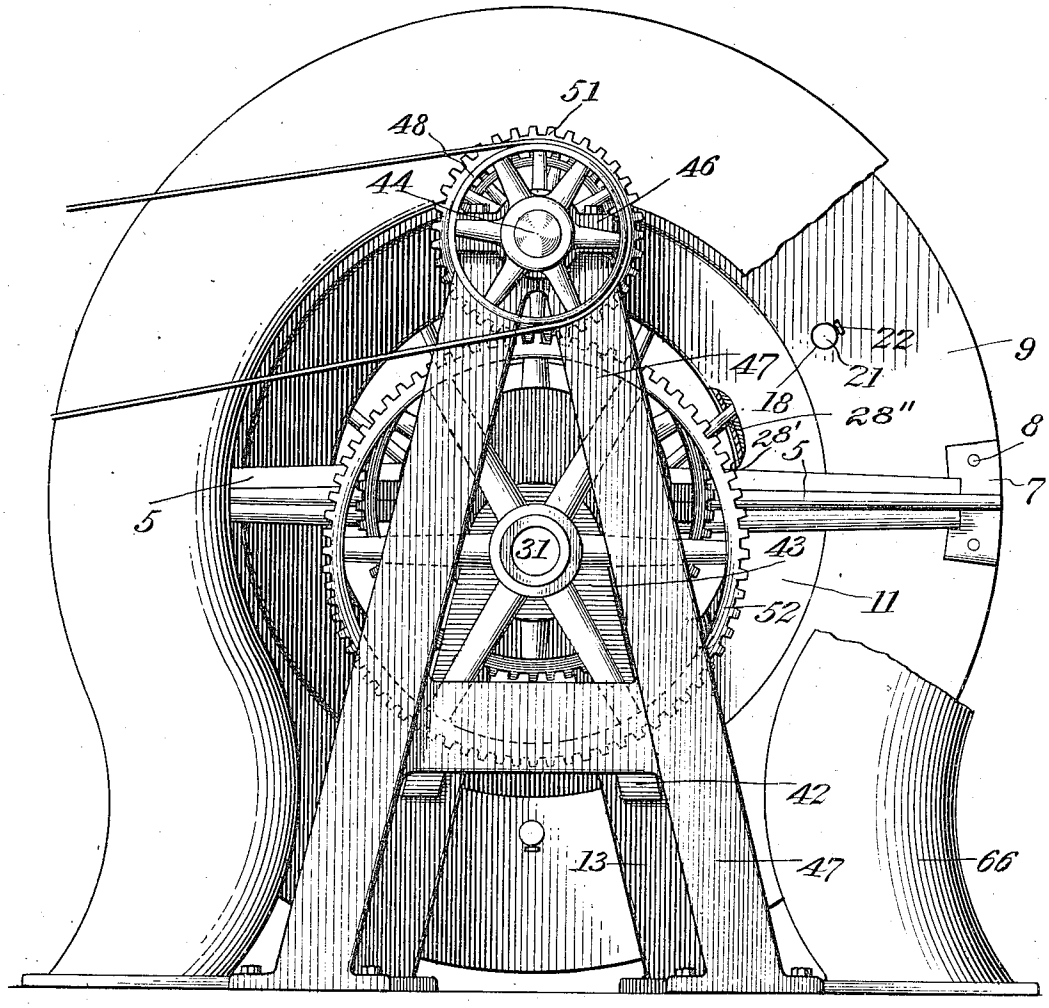
ROTARY AIR COMPRESSOR.

APPLICATION FILED APR. 29, 1909.

949,714. Patented Feb. 15, 1910.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Fenton S Belt

P. M. Smith

Inventor

Frank Peck

By Victor J. Evans

Attorney

F. PECK.

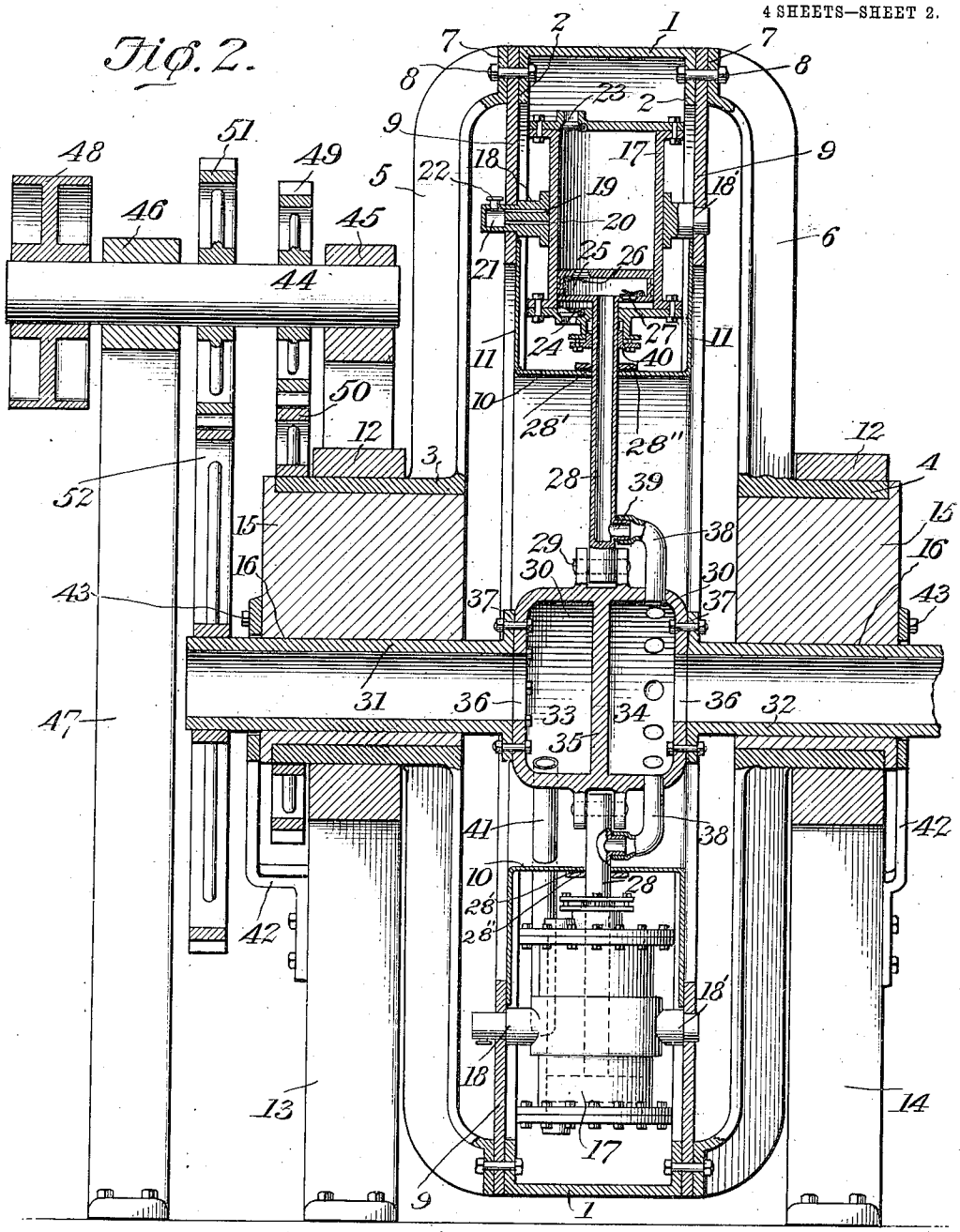
ROTARY AIR COMPRESSOR.

APPLICATION FILED APR. 29, 1909.

949,714. Patented Feb. 15, 1910.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

Fenton & Belt

P. M. Smith

Inventor

Frank Peck

By Victor J. Evans

Attorney

F. PECK.

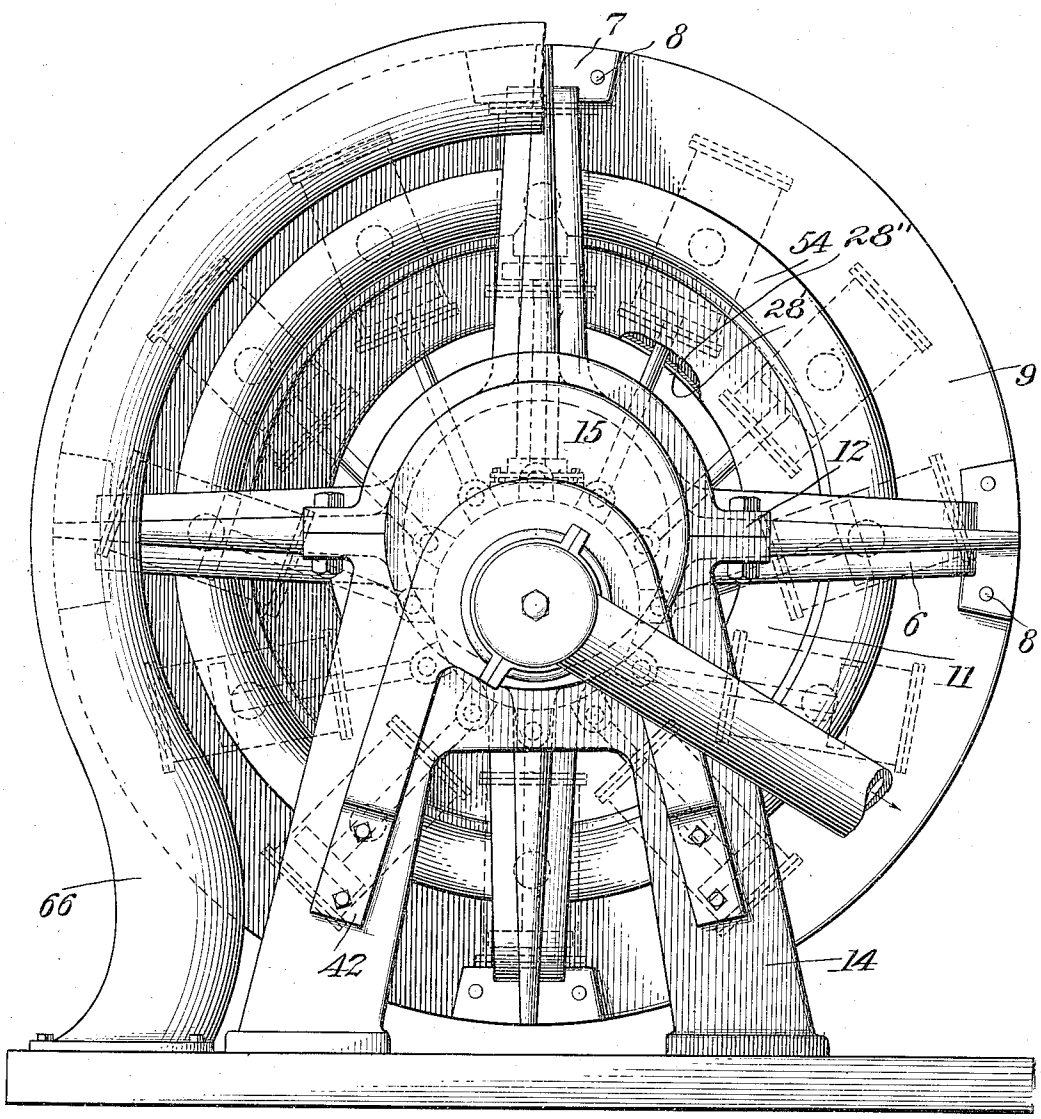
ROTARY AIR COMPRESSOR.

APPLICATION FILED APR. 29, 1909.

949,714. Patented Feb. 15, 1910.

4 SHEETS—SHEET 3.

Fig. 3.



Inventor

Frank Peck

By Victor J. Evans,

Attorney.

Witnesses

Fenton S. Belt

P. M. Smith

F. PECK.

ROTARY AIR COMPRESSOR.

APPLICATION FILED APR. 29, 1909.

949,714. Patented Feb. 15, 1910.

4 SHEETS—SHEET 4.

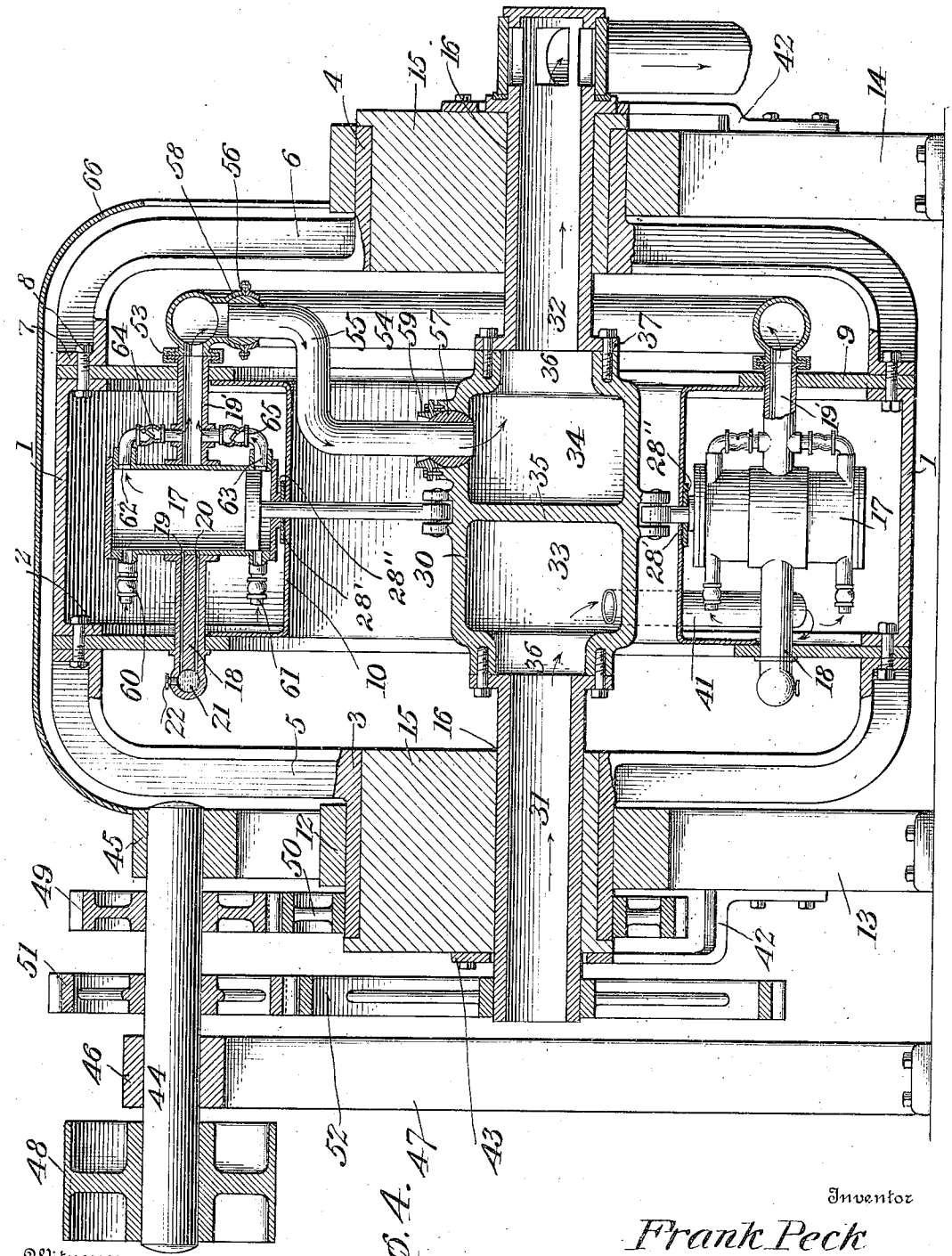


Fig. 4.

Witnesses

Fenton S. Pelt

P. M. Smith

Inventor

Frank Peck

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

FRANK PECK, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE PECK AIR COMPRESSOR COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

ROTARY AIR-COMPRESSOR.

949,714. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed April 29, 1909. Serial No. 492,969.

To all whom it may concern:

Be it known that I, FRANK PECK, a subject of the King of Great Britain, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Rotary Air-Compressors, of which the following is a specification.

This invention relates to rotary air compressors, the object of the invention being to provide an air compressor of the character described which will run without appreciable jar or vibration reducing the friction to a minimum and thereby avoiding excessive heating of the parts, also economizing in the power necessary to drive the air compressor in proportion to the air compressing capacity of the machine.

A further object of the invention is to combine the parts of the air compressor in such manner as to render the device, as a whole, exceedingly compact, strong and durable.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a view in elevation of a rotary air compressor embodying the present invention. Fig. 2 is a vertical sectional view of the same taken in line with the center of the hollow shaft. Fig. 3 is a view in elevation of an air compressor embodying certain modifications as compared with the machine shown in Figs. 1 and 2. Fig. 4 is a vertical section through the same taken in line with the center of the hollow shaft.

In the preferred embodiment of the invention, illustrated in Figs. 1 and 2, the air compressor embodies a cylindrical rim 1 provided along its opposite edges with inwardly extending flanges 2, the said rim being carried by a pair of hub sections 3 and 4 provided with radial arms 5 and 6 flanged at their outer ends as shown at 7 and bolted to the flanges 2 of the rim 1 as shown at 8.

Between the flanges 2 and 7 referred to are clamped a pair of parallel annular bearing plates 9 which form portions of a cylindrical casing or jacket. The inner portion of this jacket is shown at 10, the same being provided with parallel side flanges 11 which overlap at their outer edges, the inner edges of the plates 9, thereby forming an inclosed air space in which air is introduced for the purpose of cooling the air compressing cylinders hereinafter more particularly described.

The hub sections 3 and 4 by which the main rim 1 is carried, are mounted in bearings 12 at the upper ends of pedestals 13 and 14 and the said hub sections embrace cores 15 in which bearing openings 16 are formed for a hollow shaft to be hereinafter more fully described.

Mounted in the jacket comprised between the outer and inner walls 1 and 10 and the side walls 9 and 11 is a circular series of air compressing cylinders 17. Each of these cylinders is mounted for independent oscillation by providing the same with oppositely extending trunnions 18 and 18′, the same being journaled in bearing openings in the plates 9 above referred to and as clearly shown in Fig. 2. In order to provide for lubricating the piston and cylinder, one of the trunnions 18 is provided with substantially parallel air and oil passages 19 and 20 respectively, leading from the inside of the cylinder to an oil cup or reservoir 21 mounted on the end of the trunnion 18 and provided with a filling cap or plug 22. Each cylinder is further provided at its opposite ends with outer and inner air intake valves 23 and 24 respectively, the same being in the form of inwardly opening check valves.

Within each cylinder 17 works a hollow cylindrical piston 25 provided in its opposite sides with air inlet valves 26 and 27, the same being in the form of inwardly opening check valves. The piston is mounted on the outer end of a hollow piston rod 28, the inner end of which is pivotally connected at 29 to the central section 30 of a hollow shaft embodying relatively smaller end sections 31 and 32, which sections are journaled in the bearing openings 16 in the cores 15 above referred to. The piston rods 28 pass through slots 28′ in the wall 10 of the jacket and also through sliding follower plates 28″ working against the wall 10 and closing the slots 28′.

The central larger section 30 of the hollow shaft is divided into air-receiving and discharge compartments 33 and 34 by means of a central dividing partition 35 and is provided in its opposite sides with ports 36

which communicate directly with the smaller end portions 31 and 32 of the shaft, the last-named sections being provided with flanges 37 by means of which they may be bolted to the central section of the shaft, as shown in Fig. 2.

Each of the hollow piston rods 28 is placed in communication with the discharge chamber 34 by means of a flexible pipe 38 the outer end of which is secured upon a nipple 39 extending laterally from the hollow piston rod 28 as shown in Fig. 2. Each cylinder is further provided with a stuffing box 40 through which the rod 28 reciprocates, forming a tight joint between said rod and the cylinder.

Leading from the receiving chamber 33 into the annular air jacket above described is a pipe 41 whereby the air received in the section 31 of the shaft is conveyed through the compartment 33 and pipe 41 into the said air jacket where it circulates entirely around the jacket and among the cylinders serving to keep the same in a cool condition. The cores 15 are prevented from rotating by means of braces or stays 42 fastened at one end to the pedestals 13 and 14 and connected at their opposite ends to said cores as shown at 43.

44 designates a counter-shaft which is mounted in a bearing 45 at the top of the pedestal 13 and in another bearing 46 at the top of an additional pedestal 47, said shaft being provided at its outer end with a drive pulley 48 adapted to receive motion by means of a belt from any suitable motor. A gear wheel 49 on the counter-shaft 44 meshes with a corresponding gear wheel 50 fast on one of the hub sections 3 of the main frame 1 thus imparting rotary motion thereto. Another gear wheel 51 fast on the shaft 44 meshes with a similar wheel 52 fast on the projecting end of the section 31 of the hollow shaft thereby imparting motion to said shaft. The last-named shaft and the main rim 1 are driven at the same rate of speed and it will be noted that the axes of rotation are eccentric with relation to each other or arranged at a distance apart equal to one-half the stroke of the pistons 25, therefore, in each complete revolution of the air compressor, a complete back and forth stroke is imparted to each and every piston 25.

In operation, referring to Fig. 2 of the drawings as the piston 25 moves outward, the valve 23 closes and the valve 26 opens and the air held between the piston and outer end of the cylinder is caused to pass through the rod 28 into the chamber 34 and out through the shaft section 32. In the reverse movement of the piston, the valve 23 opens, the valve 26 closes, the valve 27 opens, and the valve 24 closes, therefore the air caught between the piston and the inner end of the cylinder is caused to pass into the piston and through the rod 28 along the same course as previously described. In this way, each piston is rendered double acting.

By now referring to the modified form of air compressor illustrated in Figs. 3 and 4, it will be observed that the trunnions 19′ of each cylinder may be made hollow as shown in Fig. 4 and the said trunnions may be connected by means of a flanged swiveled joint 53 to a common, connecting circular pipe 54 arranged between the arms 6 and the air jacket, the said circular pipe being placed in communication with the discharge chamber 34 by means of a flexible pipe 55 the ends of which are slidingly arranged in the ball members 56 and 57 of ball and socket joints 58 and 59 associated respectively with the pipe 54 and the central enlarged section 30 of the hollow shaft as clearly shown in Fig. 4. The air intake valves 60 and 61 may be arranged in one side of the cylinder while at the opposite side, the connections 62 and 63 are interposed between the cylinder and the hollow trunnion 19′, said connections containing check valves 64 and 65 which allow the air to pass from the cylinder into the pipe 54 while preventing the return thereof. The arrangement just described and clearly illustrated in Fig. 4 also provides a double action of each pump cylinder, each stroke of the piston serving to draw in and expel air in the compressing operation. If desired, a casing 66 may be placed over the upper portion of the compressor as shown in Fig. 4 to partially inclose the same.

The construction illustrated in Figs. 1 and 2 is preferred, however, for the reason that it admits of a more compact relation of the parts without detracting in any way from the efficiency of the compressor, as a whole.

I claim:—

1. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders journaled in said jacket and communicating therewith, pistons working in said cylinders, a hollow two chambered piston controlling hub, to which the rods of the pistons are connected, cylinder carrying hubs for said rotary jacket eccentric to the first-named hub, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, means for conducting air from one chamber of said hub to the rotary jacket, and valve controlled means for conducting air from the compression cylinders to the other chamber of the piston controlling hub.

2. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders journaled in said jacket and communicating therewith, valved hollow pistons working in said cylinders, a hollow two

chambered piston controlling hub to which the rods of said pistons are connected, cylinder carrying hubs for the rotary jacket eccentric to the first-named hub, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, means for conducting air from one chamber of said hub to the rotary jacket, and valve controlled means for conducting air from the compressing cylinder to the other chamber of the piston controlling hub.

3. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders journaled in said jacket and communicating therewith, valved hollow pistons working in said cylinders, hollow piston rods, a hollow two chambered piston controlling hub to which the rods of said piston are connected and with one of the chambers of which said rods are placed in communication, cylinder carrying hubs for the rotary jacket eccentric to the first named hub, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, and means for conducting air from one chamber of said hub to the rotary jacket.

4. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders journaled in said jacket and communicating therewith, valved hollow pistons working in said cylinders, hollow piston rods, a hollow two chambered piston controlling hub to which said piston rods are connected, flexible connections between said hollow piston rods and one of the air chambers of the hub, cylinder carrying hubs for said rotary jacket, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, and means for conducting air from one chamber of said hub to the rotary jacket.

5. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders journaled in said jacket and communicating therewith, valved hollow double acting pistons working in said cylinders, hollow piston rods, a hollow two chambered piston controlling hub to which the piston rods are connected, cylinder carrying hubs for said rotary jacket eccentric to the first named hub, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, and means for conducting air from one chamber of said hub to the rotary jacket.

6. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders journaled on said shaft and communicating with said jacket, pistons in said cylinders, a hollow two chambered piston controlling hub, piston rods having a jointed connection with said hub, cylinder carrying hubs for the rotary jacket eccentric to the first named hub, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, means for conducting air from one chamber of said hub to the rotary jacket, and valve controlled means for conducting air from the compressing cylinders to the other chamber of the piston controlling hub.

7. A rotary air compressor comprising a rotary annular air jacket, a circular series of radially disposed air compressing cylinders and communicating with said jacket and provided with inlet valves at opposite ends thereof, pistons working in said cylinders and provided with valves in the opposite heads thereof, a hollow two chambered piston controlling hub to which the rods of said pistons are connected, cylinder carrying hubs for said rotary jacket eccentric to the first named hub, hollow shaft sections communicating at opposite ends with the chambers of the piston controlling hub, means for conducting air from one chamber of said hub to the rotary jacket, and hollow piston rods connecting the hollow pistons with one of the air chambers of the piston controlling hub.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK PECK.

Witnesses:
LLOYD L. SYKES,
EDWARD LYNN.