Oct. 17, 1933. G. E. ROBERTS 1,931,207

COMPRESSOR

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Fig. 1.

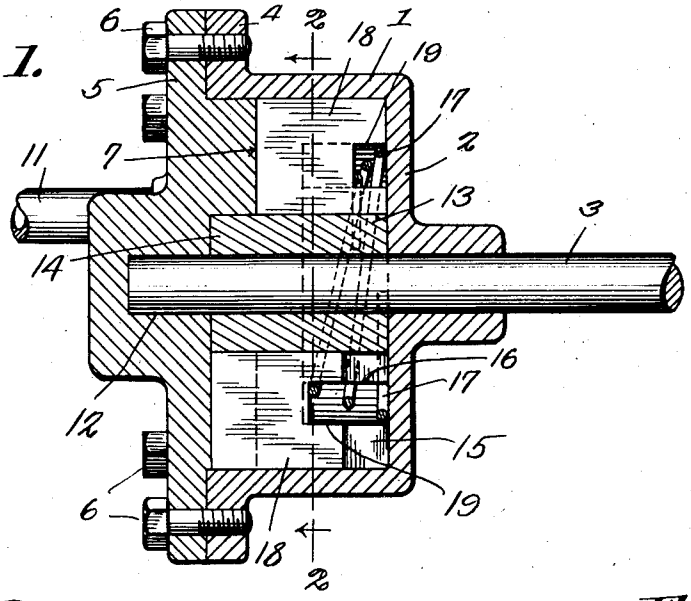


Fig. 2.

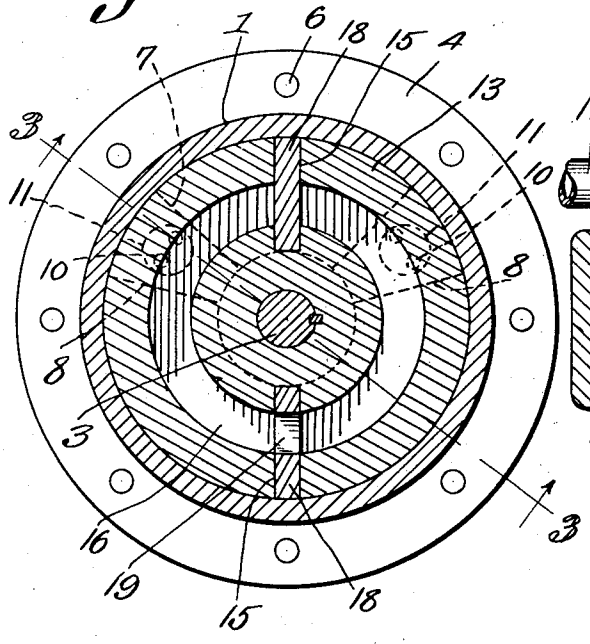
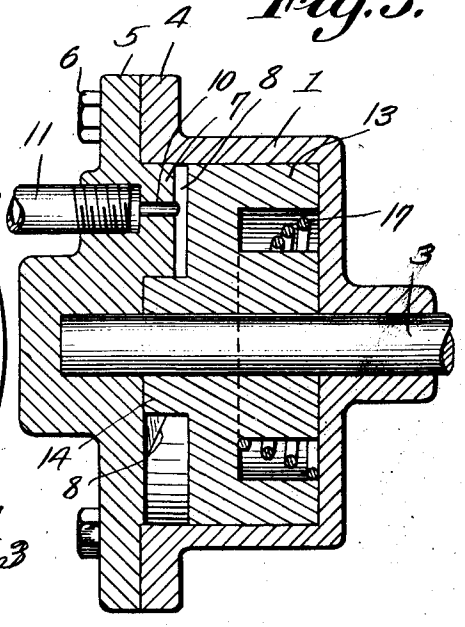


Fig. 3.



Inventor

G. E. Roberts

By C. A. Snow & Co.

Attorneys.

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Fig. 4.

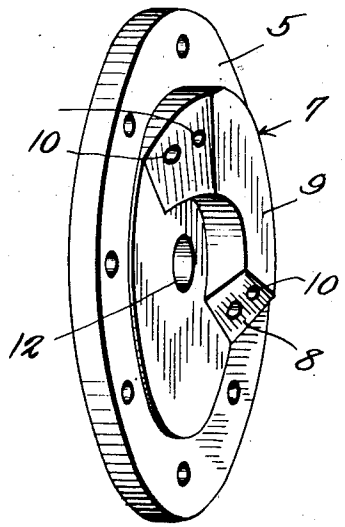
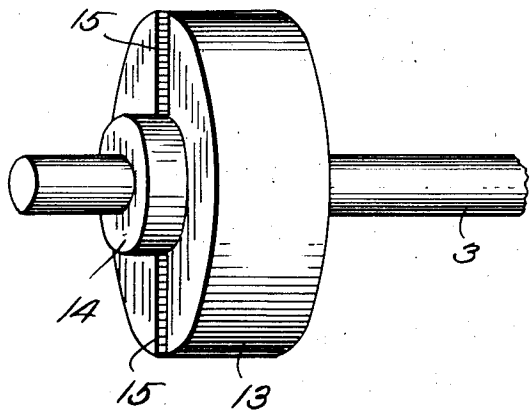


Fig. 5.



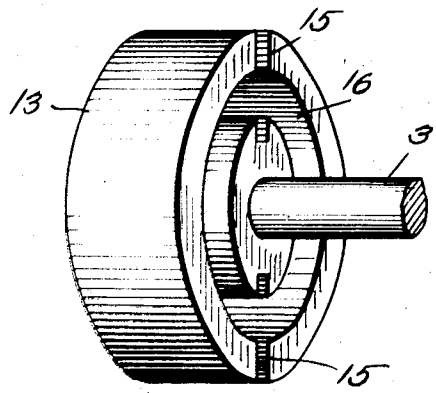


Fig. 6.

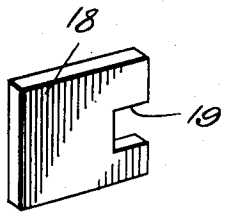


Fig. 7.

Inventor

G. E. Roberts

By C. A. Snow & Co.

Attorneys.

Patented Oct. 17, 1933

1,931,207

UNITED STATES PATENT OFFICE

1,931,207

COMPRESSOR

George E. Roberts, Glendale, Calif., assignor of one-fourth to Rudolph A. Riek and one-fourth to Forest O. Riek, both of Rhinelander, Wis.

Application May 26, 1932. Serial No. 613,735

1 Claim. (Cl. 230—152)

REISSUED

This invention relates to a rotary compressor and while it is designed more especially for use in systems of mechanical refrigeration, it can also be advantageously employed in hydraulic transmissions and wherever it may be desired to circulate or compress fluid in a simple and efficient manner.

One of the objects of the invention is to provide a rotary compressor made up of the minimum number of parts, it being possible to readily assemble them.

Another object is to provide a compressor of this type which will not easily get out of order, and can be made at low cost.

A still further object is to provide a compressor which will operate efficiently at a comparatively slow speed, it being possible to obtain efficient results from a 6" rotor operating as low as 60 R. P. M.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed it being understood that changes may be made in the precise embodiment of the invention herein disclosed within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:

Figure 1 is a central longitudinal section through the compressor.

Figure 2 is a section on line 2—2, Figure 1.

Figure 3 is a section on line 3—3, Figure 2.

Figure 4 is a perspective view of the head of the stator.

Figure 5 is a perspective view of the rotor showing that face thereof which coacts with the head.

Figure 6 is another perspective view of the rotor showing the opposite face thereof.

Figure 7 is a perspective view of one of the vanes.

Referring to the figures by characters of reference, 1 designates a stator which is preferably cylindrical. One end is closed by a head 2 which can be integral therewith and provides a bearing for the shaft 3 of the rotor. The other or open end of the stator has an annular flange 4 to which a removable head 5 is detachably secured by means of bolts or other suitable devices, indicated at 6. This head has an arcuate abutment 7 formed on its inner face, the ends 8 of the abutment being inclined toward the flat intermediate surface 9 of said abutment. One or more ports 10 can open through each inclined or deflecting end of the abutment and these can be in communication with pipes 11 one of which can constitute an inlet for fluid to be compressed while the other constitutes the outlet for the compressed fluid.

The removable head 7 has a socket 12 constituting an end bearing for the shaft 3. Secured to this shaft between the heads 2 and 5 is a rotor 13 one face of which is adapted to fit snugly against the flat surface 7 of the abutment. A hub 14 is extended from said surface of the rotor and abuts against head 5, its periphery having a tight working fit against the inner arcuate surface of the abutment 7.

The rotor is provided with diametrically opposed radial slots 15 extending therethrough from the periphery of the rotor inwardly to the periphery of hub 14. These slots are intersected by a deep circular channel 16 formed in that face of the rotor nearest head 2. This channel, which is concentric with the rotor, provides a seat for a coiled spring 17 which bears at one end against head 2 and normally thrusts at its other end against the inner end wall of the channel.

Slidable within each of the slots 15 is a plate 18 constituting a vane. Each plate extends from the inner wall of its slot outwardly to the periphery of the rotor and that end of the plate or vane nearest head 2 is recessed at 19 so as to straddle the adjacent convolutions of spring 17. Thus the one spring serves to hold both vanes normally pressed toward head 5. Consequently, as the rotor 13 is operated, each vane will successively ride over one inclined terminal 8 of the abutment so as to place the spring under compression, then along the flat surface 9 of the abutment and subsequently down the other inclined terminal 8 and along the head 5. During this movement of each vane, fluid in advance thereof will be expelled through the ports 10 first reached by the vane and as the said vane moves away from the other terminal of the abutment the fluid to be compressed will be sucked through the port or ports in said terminal and positioned behind the vane. By providing two vanes, as shown, a continuous stream of fluid can be delivered under pressure from the stator. It has been found in practice that a compressor constructed as described can be made at low cost and will operate efficiently at a low speed. Importance is attached to the fact that it is made up of very few parts and consequently

will seldom require repairs. All of the parts are readily accessible by removing the head 5 and in the event of excessive wear on the vanes those parts can be easily removed without requiring the services of a skilled mechanic.

The spring 17 maintains a tight working contact between the vanes and the head 5 and the abutment 7 thereon.

Although this device has been described as primarily for use as a compressor it is also to be understood that it can be used as a transmission unit.

What is claimed is:

A device of the class described including a stator having opposed heads, one of the heads being removable, a rotor having a hub on one face thrusting against the removable head, radial grooves extending into the rotor from the periphery thereof, there being a circular concentric channel in that face of the rotor remote from the removable head, said channel intersecting the grooves, there being a tight working fit between the peripheries of the stator and the rotor, an arcuate abutment on the removable head fitting snugly against the peripheral portion of the stator and having a tight working fit against the periphery of the hub, said abutment having a flat intermediate surface having working engagement with one face of the rotor, there being inclined terminals on the abutment provided with inlet and outlet ports respectively, vanes slidable in the slots and along the terminal and intermediate portions of the abutment and along that portion of the removable head exposed between the terminals of the abutment, there being a recess in each vane registering with the circular channel, and a spring seated in the channel and recesses thrusting against one head of the stator for maintaining a tight working fit between the removable head and its abutment and the vanes.

GEORGE E. ROBERTS.