W. R. THOMPSON.

AIR COMPRESSOR.

APPLICATION FILED JAN. 30, 1909.

940,751. **Patented Nov. 23, 1909.**

Fig. 1.

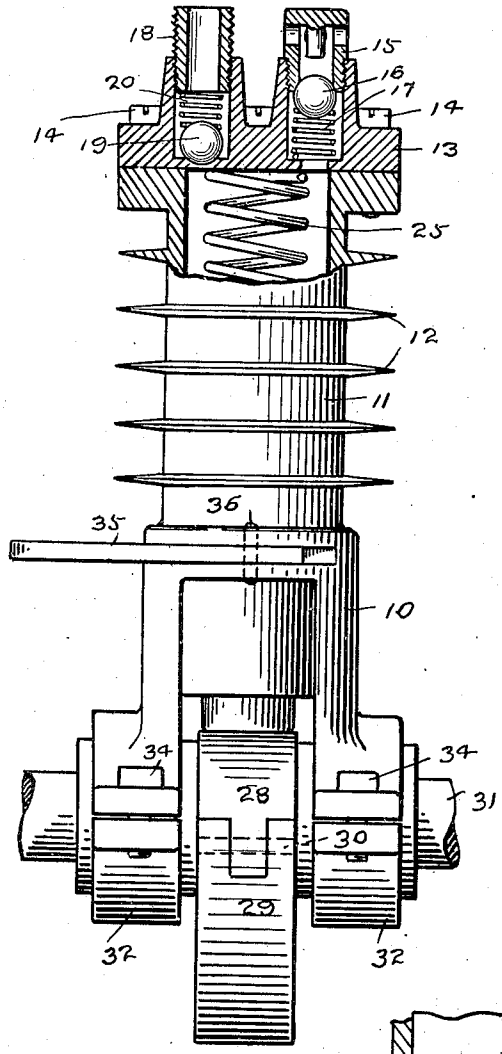


Fig. 2.

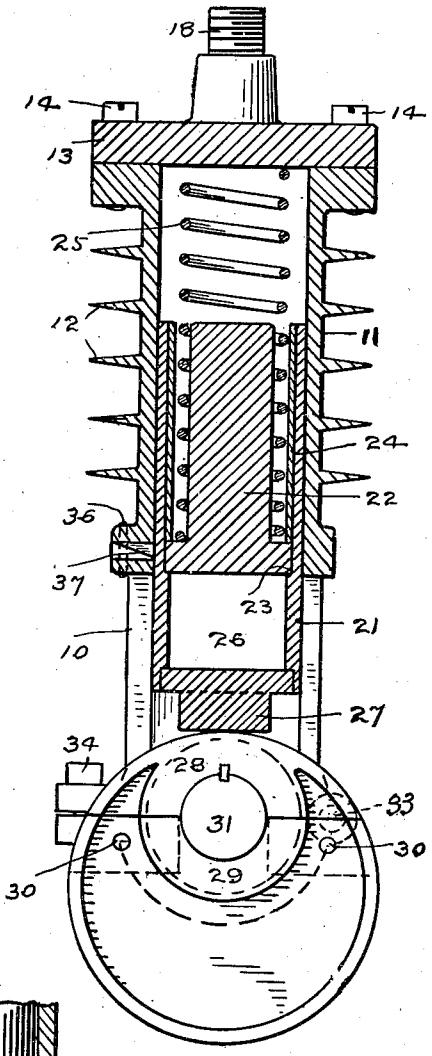
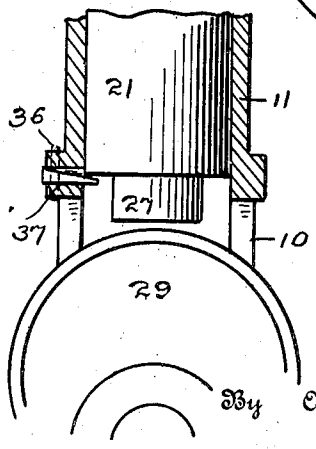


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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AIR-COMPRESSOR.

940,751. Specification of Letters Patent. Patented Nov. 23, 1909.

Application filed January 30, 1909. Serial No. 475,206.

To all whom it may concern:

Be it known that I, WILLIAM R. THOMPSON, a citizen of the United States, residing at South Norwalk, county of Fairfield, State of Connecticut, have invented a new and useful Air-Compressor, of which the following is a specification.

This invention relates to air pumps or compressors of the type in which the piston is actuated positively in one direction and in the opposite or return direction by a spring.

The compressor is designed for general use, but especially for use on motor boats or for compressing air into a tank for use in dental offices.

The especial object of the invention is to provide a structure of this type of compressor in which the spring will be entirely protected from the atmosphere and so located that it can work in ample oil, and the structure being such that each stroke of the piston will compress the air to the utmost, by having the spring located in an annular recess in the piston so that the end of the piston can go practically to the end of the cylinder, the spring being contracted almost to an extent to completely close its coils.

Another object of the invention is to provide a compressor of this type which may be easily thrown out of action without stopping the actuating means.

To these ends, the invention consists in the construction and combination of parts substantially as hereinafter claimed.

Of the accompanying drawings, Figure 1 is an elevation of a compressor embodying my invention, a portion being broken out to illustrate the valve structure; Fig. 2 is a view at a right angle to Fig. 1, portions being in section through substantially the vertical center of Fig. 1; Fig. 3 is a detail view illustrating the position of the locking lever when holding the piston clear of the actuating cam.

Similar reference characters indicate the same or similar parts in all of the views.

A suitably formed frame or casting 10 supports the cylinder 11 which latter may have heat radiating ribs 12. The cylinder head 13, secured by bolts 14, is provided with an inlet nipple 15 the inner end of which forms a seat for the valve 16, a spring 17 holding said valve normally seated. An outlet pipe is indicated at 18, a check valve 19 being held against a seat in head 13 by a spring 20.

The piston is elongated and has a deep annular recess capable of receiving the entire spring when the piston is at one extreme of its movement. The actual details of structure of the piston are not important and may be variously modified. The form shown in the drawings comprises an outer member 21 and an inner member 22 which is in the form of a plug, the outer member being formed internally with a shoulder 23 against which the lower end of the inner member is held by a shell 24, and also by the spring 25 the upper end of which bears against the under surface of the head 13. Obviously, however, the piston might be otherwise constructed, provided it has an annular space or recess of a depth to receive the entire spring 25 when the piston is forced almost or quite to the head 13, so as to obtain the greatest force. The space 26 below the lower end of the inner member 22 and the head 27 of the outer member makes the piston of the form illustrated comparatively light. But as has been stated, the most essential feature of the invention is that the annular space or recess in the piston shall be of a depth capable of receiving the entire spring when the latter is compressed by the piston being forced to its innermost position, so that the inner end of the piston can go practically to the end of the cylinder, and that the plug forming the center or body of the piston shall reduce the air space to the utmost limit so as to get the highest pressure possible.

The piston actuating cam comprises two members 28 and 29 tongue-and-grooved together as shown in Fig. 1 and secured by transverse pins 30, whereby the cam may be readily applied to or removed from the engine or other shaft 31. The lower ends of the frame or casting are provided with half bearings, the other halves being formed by cap members 32 which are hinged or pivoted to the fixed members as at 33, and are secured by bolts 34.

A locking lever 35 is pivoted at 36 at one side of the lower end of the cylinder, and has a cam or inclined tip 37 which may occupy either the position shown in Fig. 2 or may be shifted to the position shown in Fig. 3. The lever 35 is so located that when the piston has been elevated or advanced to

its extreme position, the wedge-shaped tip of the incline 37 may be just advanced under the piston and the lever member then actuated further so that the incline will lift the piston sufficiently to enable the actuating cam on the shaft to clear the bearing face of the piston head 27.

During the operation of the compressor, the cam actuates the piston just far enough, relatively to the position of the wedge tipped lever 35, so that the extreme tip of said lever can be projected under the shoulder of the piston at one side of the head 27. Further movement of the wedge tipped lever pulls the piston back so that the further movements of the actuating cam will wholly clear it. This enables the engine to be kept running, but the cam will not touch the piston, and so the compressor can be taken out of action at any time. But still there will be no clicking or sound of a blow from the cam on the engine shaft. Therefore, the device is especially useful on motor boats for operating the whistles thereof, it not being desirable that the compressor shall be working all the time that the boat is running.

By comparing the shape of the actuating cam with the space shown in Fig. 2 above the upper end of the plug or core 22, it will be seen that when the piston is forced to its fullest extent, the end of the plug or core will almost touch the cylinder head 13. Therefore, the air is compressed to almost the capacity afforded by the annular space around the core 22, which space is very slight because then the space is almost filled by the almost closed coils of the spring.

Having now described my invention, what I claim is:—

1. A compressor comprising a cylinder, a piston working therein and provided with a solid compressor member having an annular recess surrounding a central plug, a spring fitting within said recess and normally tending to project said piston from said cylinder, and means for forcing said compressor member practically to the end of the cylinder, said plug telescoping within said spring as the latter is compressed, the convolutions of the spring being arranged to come together when compressed, whereby the end of the piston presents a substantially solid surface.

2. A compressor comprising a cylinder, a removable end head therefor provided with inlet and outlet passages, valves for said passages, a piston working in said cylinder and provided with a solid compressor member having an annular recess surrounding a central plug, a spring fitting within said recess and normally tending to project said piston from said cylinder, and means for forcing said compressor member practically to the end of the cylinder, said plug telescoping within said spring as the latter is compressed, the convolutions of the spring being arranged to come together when compressed, whereby the end of the piston presents a substantially solid surface.

3. The combination with a cylinder and piston, of a spring for moving the piston in one direction, a cam for actuating the piston in the opposite direction, and means for moving and holding the piston out of position to be engaged by said cam, said means comprising a wedge movable to engage a portion of the piston, said wedge being mounted in position to enable its tip to engage a portion of the piston when the latter is actuated by the cam, whereby further movement of the wedge may positively force the piston out of position to be engaged by the cam.

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

WILLIAM R. THOMPSON.

Witnesses:
MYRON W. OSBORN,
LEONARD ROBINS.