A. T. NEWELL.

AIR COMPRESSOR.

APPLICATION FILED MAR. 5, 1909.

942,455.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

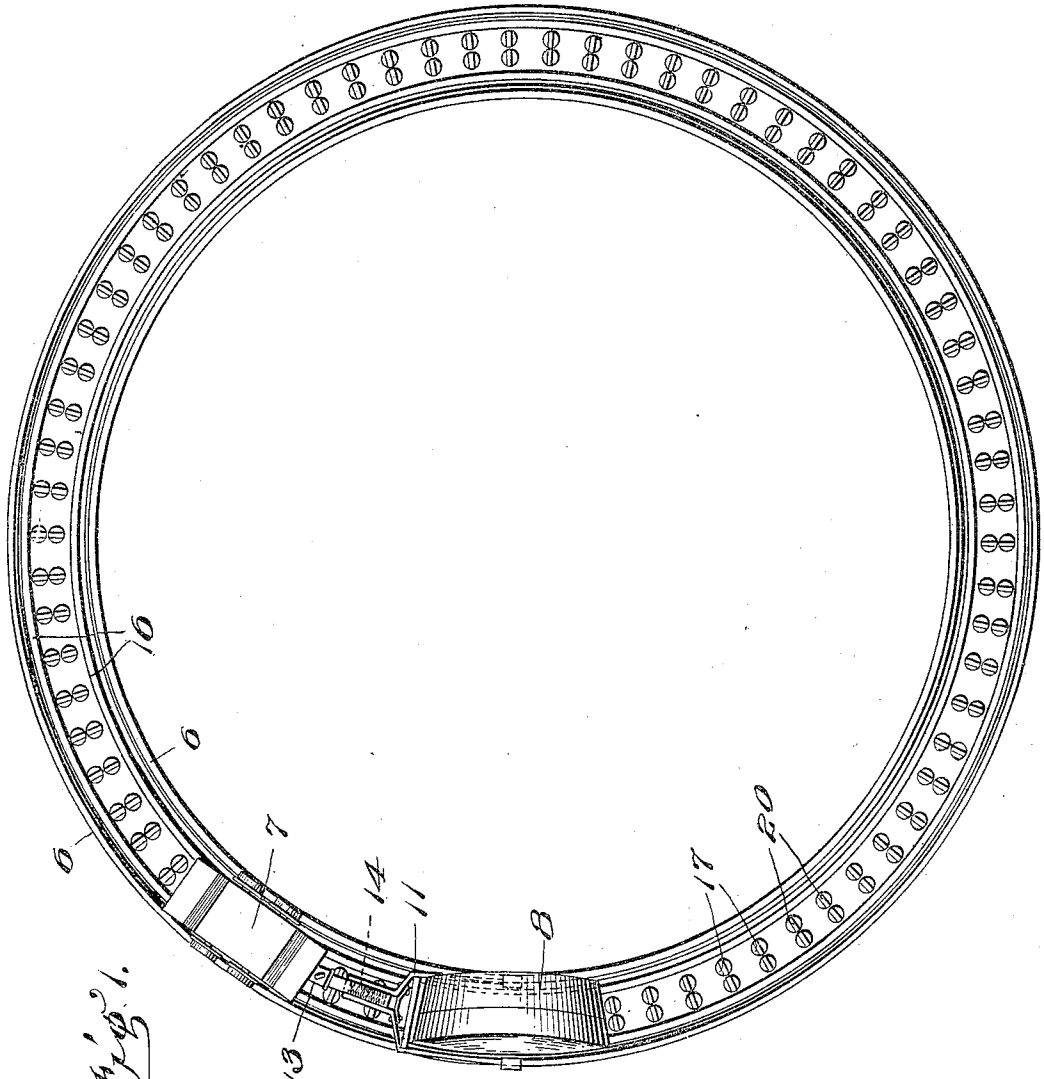


Fig. 1.

Inventor

Alfred T. Newell.

Witnesses

Jos. L. Thoms

Harold Megraw

By

Attorney

A. T. NEWELL.

AIR COMPRESSOR.

APPLICATION FILED MAR. 5, 1909.

942,455.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 2.

Fig. 2.

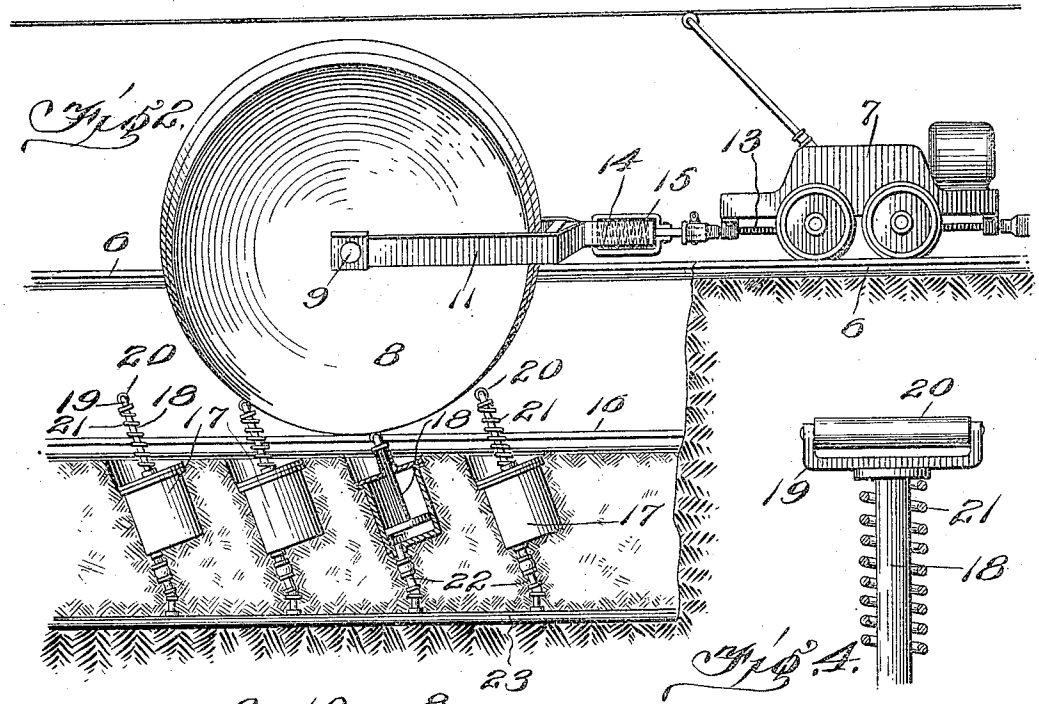


Fig. 4.

Fig. 3.

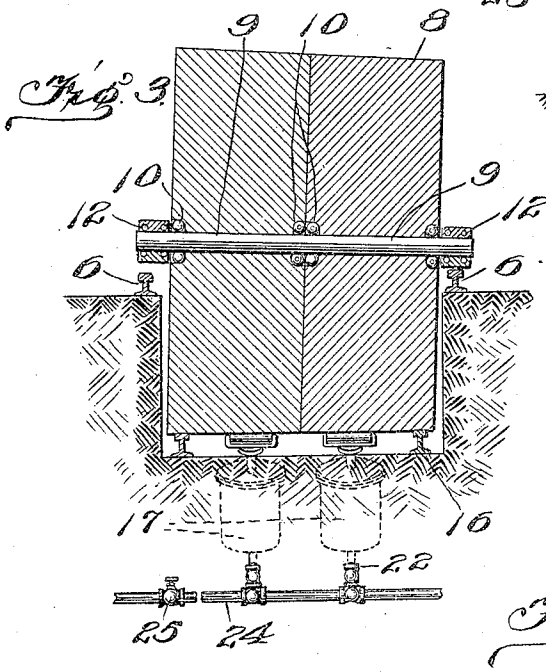
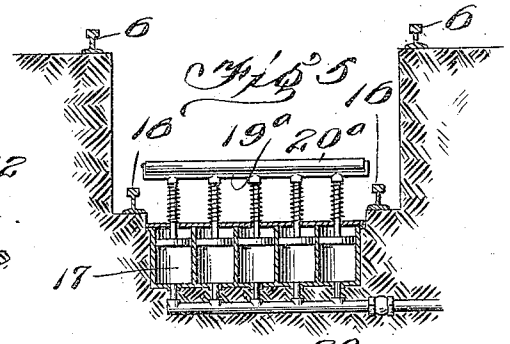


Fig. 5.



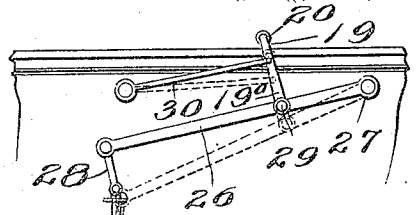
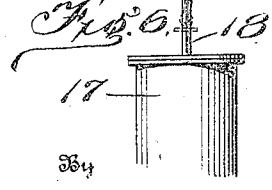


Fig. 6.



Witnesses:

Geo. L. Knox

Harold Megrue

Inventor

A. T. Newell.

By

Attorney

UNITED STATES PATENT OFFICE.

ALFRED T. NEWELL, OF BIRMINGHAM, ALABAMA.

AIR-COMPRESSOR.

942,455. Specification of Letters Patent. Patented Dec. 7, 1909.

Application filed March 5, 1909. Serial No. 481,303.

To all whom it may concern:

Be it known that I, ALFRED T. NEWELL, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

This invention relates to air compressors of that type having a weighted roller which is drawn by a suitable motor around a circular track and in its course rolls over the pistons of air pumps set between the rails of the track and depresses said pistons, thereby compressing the air in the pumps, whence it may be conducted and utilized for any purpose desired.

The object of the invention is to provide an improved apparatus of the kind indicated, which will require a minimum of power to develop a high degree of pressure, an especial feature being the location of the engine or motor with respect to the weighted roller.

Various advantages with respect to the details of the construction will be apparent from the following description and the accompanying drawings.

In the drawings, Figure 1 is a plan view of the apparatus; Fig. 2 is a side elevation partly in section; Fig. 3 is a vertical cross section showing the roller in side elevation; Fig. 4 is a detail of one of the piston rods; Fig. 5 is a sectional view of a modified form of pump; Fig. 6 is a detail in side elevation of another modification.

Referring specifically to the drawings, 6 indicates the rails of a circular track on which travels a motor 7. This is indicated as an electric motor, but a locomotive may be substituted. This motor draws a roller 8 of large diameter and great weight. The roller is preferably made in two sections and it turns upon an axle 9 with ball bearings 10 to decrease friction. The axle is connected to the motor by means of a yoke 11 the arms of which are connected to the ends of the axles by boxes having ball bearings 12. The stem of the yoke is connected to the draw bar 13 of the motor. The connection is preferably formed with a spring 14 contained in a draw head 15 whereby the pull of the motor will be cushioned, and the spring will also prevent possible breakage of the connecting devices when the motor is stopped or the brakes applied.

The roller sections 8 travel on rails 16 which, as shown, are depressed sufficiently below the level of the track 6 to bring the motor in substantially a straight line with the axle of the roller, whereby all the tractive force of the motor is exerted in a straight pull, and the diameter of the roller may be made large enough to give a practically direct pressure or thrust on the pistons of the pumps. This manner of hauling the roller is much superior to force applied through radial arms from a central shaft, as has heretofore been proposed. The direct pull on the roller also enables a high rate of speed to be used, particularly if the track be made of large diameter. The roller will be tapered according to the diameter of the track, so as to run true around the same.

The pump cylinders 17 are suitably supported in position between the rails 16 of the roller track, and they are preferably inclined as clearly shown in Fig. 2 toward the direction of approach of the roller. The piston rods 18 project above the track and are provided at their upper ends with yokes 19 carrying rollers 20 in order to lessen the friction with the weighted roller. Springs 21, coiled around the piston rods normally maintain the pistons in raised position. Pipes 22 lead off from each cylinder to a main 23 which may be extended to any suitable tank or reservoir. The piston and pipes are provided with suitably acting valves to perform the functions of a single acting pump.

Inasmuch as the effective operation of the apparatus will depend largely upon the momentum of the rolling weight, it will be advantageous to avoid the resistance of compression of the air until considerable speed is developed, and in order to do this, I provide the main 23 with a vent branch 24 provided with a globe valve 25 and opening to the atmosphere. When the motor is started the valve 25 will be opened, allowing the pumps to operate freely without any back pressure or resistance, the reservoir being cut off from the main by any suitable valve. The air compressed in the pump cylinders will then escape freely through the branch 24 and allow the motor to get up speed, after which the valve 25 can be closed and the pumps will then discharge through the main pipe into the reservoir.

In the drawings, two rows of pumps are shown, but this number may be increased or diminished as desired. The proportions of

the roller and the pumps may be varied to any desired extent, but it will be found highly advantageous to have the roller of large diameter so that it will roll easily and mount or strike the pump piston rods on almost a radial line so that practically straight pressure will be delivered by the roller as the piston is forced down.

In the drawings only one roller is shown, but it is within the scope of my invention to use a plurality of rollers hitched one behind the other. In fact as many rollers may be used as the track will hold, the power of the motor, or the number of motors, being increased accordingly. It is obvious that by the use of a sufficient number of rollers a large amount of work with respect to the compression of the air will be performed and the momentum of the moving mass of rollers will be correspondingly increased, without a proportional increase of the tractive power required inasmuch as by the means heretofore described the rollers may be started without resistance incident to any operation of air.

In Fig. 5 a modification is shown in which a series of pump cylinders is arranged in a row extending across between the tracks, and their parallel piston rods are all connected to a single yoke 19^a provided with a long roller 20^a extending crosswise between the rails 16 in position to receive the impact of the weighted roller or rollers and thus depress all the pump pistons of that row simultaneously.

In Fig. 6 a further modification is illustrated, a lever being interposed between the pump piston and the part which receives the impact of the weighted roller. Said lever is indicated at 26, fulcrumed at 27 and connected at its free end by link 28 to the outer end of the piston rod 18. The impact roller 20 is held by a yoke 19 the stem 19^a of which is connected to the lever at 29, with the roller projecting above the track in a manner similar to that heretofore described. A link 30 holds the yoke and roller in proper upright position to receive the impact of the weighted roller. This lever arrangement is of some advantage where a long stroke in the pump cylinder is desired, but preferably the pumps will be made of short stroke and large diameter, with direct action between the weighted roller and the piston rod, as shown in Fig. 2.

No limitation is implied by reason of the special structure shown in the drawing and described herein, since obviously the various parts or details of the apparatus may be varied to suit local conditions or otherwise according to the wishes of the maker.

I claim:

1. The combination of a raised track, a motor thereon, a depressed track, a weighted roller thereon connected to the motor, and pumps located under the depressed track and having piston-rods projecting above the track in the path of the roller, to be depressed thereby.

2. The combination of an upper track, a motor thereon, a track located below the upper track, a weighted roller located between the rails of the upper track and rolling on the lower track, a draft connection between the motor and the roller, and pumps located under the lower track, and means actuated by the passage of the roller thereover to operate the pumps.

3. The combination of upper and lower concentric circular tracks, a weighted roller on the lower track, a motor on the upper track, draft connections between the motor and roller, and a series of pumps located along the lower track and having operating means actuated by the passage of the roller thereover.

4. The combination of upper and lower concentric circular tracks, a weighted roller located between the rails of the upper track and movable on the lower track, an axle on which the roller turns, extending across above the upper track, a motor on the upper track, connected to the axle, and pumps located below the lower track and having operating means actuated by the passage of the roller thereover.

5. The combination of a row of pumps having pistons and rods, a yoke extending across above the pumps and fastened to the rods, a roller carried by the yoke, and a weighted roller which travels over the pumps and is arranged to contact with said roller and depress the pump pistons.

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

ALFRED T. NEWELL.

Witnesses:
M. L. Morton,
Geo. E. Tew.