

R. A. SALLEE.
VACUUM PUMP AND AIR COMPRESSOR.
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1,048,737.

Patented Dec. 31, 1912.

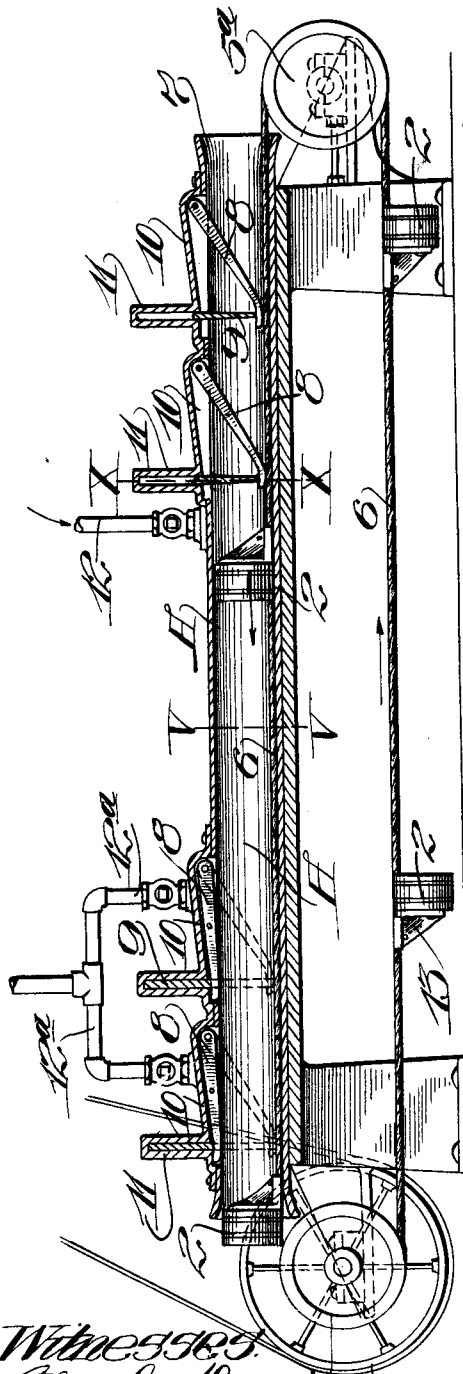


Fig. 1.

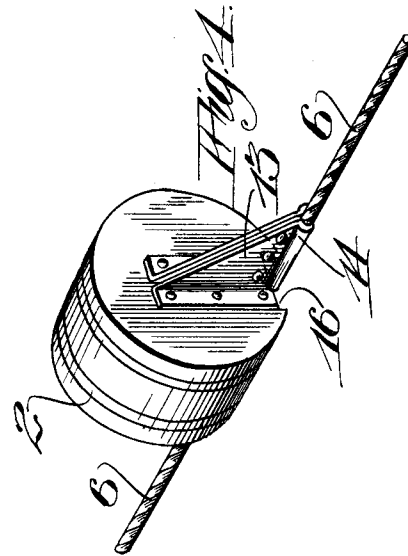


Fig. 4.

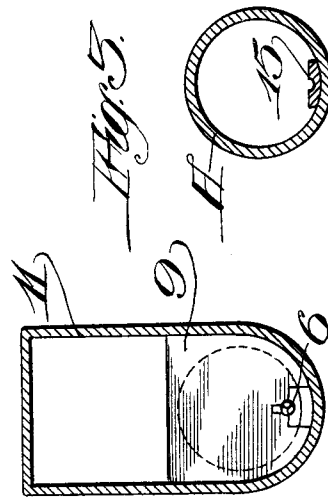


Fig. 5.

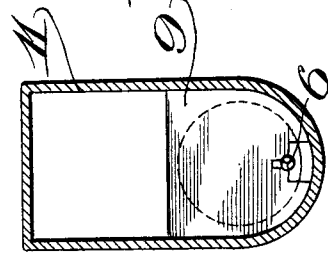


Fig. 6.

Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT A. SALLEE, OF MIDDLETOWN, CALIFORNIA.

VACUUM-PUMP AND AIR-COMPRESSOR.

1,048,737.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed April 17, 1912. Serial No. 691,383.

To all whom it may concern:

Be it known that I, ROBERT A. SALLEE, a citizen of the United States, residing at Middletown, in the county of Lake and State of California, have invented new and useful Improvements in Vacuum-Pumps and Air-Compressors, of which the following is a specification.

My invention relates to a vacuum producing or air compressing pump.

It consists in the combination of parts and details of construction which will be more fully explained by reference to the accompanying drawings in which—

Figure 1 is a longitudinal section of my apparatus. Fig. 2 is a transverse section through X—X, Fig. 1. Fig. 3 is a section through V—V, Fig. 1. Fig. 4 is a perspective view of one of the pistons or plungers.

This invention is designed to move air in considerable quantities, either for the purpose of producing a vacuum and a ventilating current or to compress the air.

As shown in the drawings, A is a tube of any desired length, and 2 are pistons having suitable rings to make tight joints and adapted to fit snugly in the tube.

3 represents the driving power, which, in the present case, is a pulley, but may be a motor of any desired form.

5 is a pulley having an endless rope or carrier which is in the present case fixed upon the shaft of the pulley 3, and 5^a is a companion pulley journaled in line and at the opposite end of the apparatus. These pulleys are so located with relation to the tube A that a driving rope or carrier 6 passes around the pulleys; the upper portion of the rope traveling through the lower part of the tube A and the other portion, after passing around the pulleys, traveling beneath or in other suitable relation with said tube.

When the apparatus is in motion, the pistons 2, which are suitably interspaced, will eventually pass through the cylinder A, thence exterior to it will pass around the pulley 5, thence below the opposite side of the tube A and again returned around the pulley 5^a.

The mouth of the tube through which the pistons enter is made divergent, as shown at 7, so as to insure the pistons properly entering. Within the tube are hinged lifters 8 which carry closing abutments 9. The upper portion of the tube is formed with raised spaces or channels 10 within which the lift-

ers 8 are pivoted, and in line with the abutments 9 are vertically disposed closed chambers and guides 11 into which the abutments may rise. As shown, these abutments are carried upon the lower ends of the inclined lifters 8, and when a piston arrives at either of these lifters it strikes it on an angle and forces it up into the inclosing space 10 above, so that the piston may pass freely and without undue friction or impediment; at the same time the abutment 9 will be lifted into this chamber and the piston will be free to pass.

As soon as the piston has passed the abutment the latter drops by gravitation, spring pressure or otherwise and closes the tube A behind the piston. The piston continuing its movement will then produce a vacuum more or less complete between its rear end and the nearest abutment 9 which is closed, as before described. The abutments are wedge shaped so as to insure proper seating. In order to avail myself of this vacuum, it may be employed to draw air or gas from any desired point. In the present case I have shown a tube 12 opening into the cylinder A contiguous to an abutment 9, so that after the piston has passed this abutment and continues its movement, the vacuum which it tends to produce will draw air in through this passage 12. If the passage connects with the face of a mining tunnel, or other point where there is liable to be foul air, it will be seen that this foul air will be constantly drawn through the tube A with a velocity depending upon the difference between its diameter and that of the tube A in which the piston travels. Thus with a small conductor 12 it will be seen that the travel through it will be very considerable when the piston is many times its diameter. There may be as many of these connections as is found desirable within the length of the tube A, and the exhausting process may be repeated after the piston has passed either set of abutments 9.

In order to suitably connect the piston with the rope 6, I have shown at the rear a diagonal brace, as at 13, the upper end of which is suitably connected with the rear of the piston, and the lower end is clamped or otherwise fastened to the rope, as indicated at 14.

It is also necessary that the piston and traveling parts be maintained in proper relation with the interior of the tube and not

allowed to turn around therein. I have, therefore, shown a groove or channel plate 15, extending through the bottom of the tube A and having a groove in it adapted to receive the rope 6.

The pistons 2 have a notch 16 formed in the lower part which fits snugly over and slides upon the plate or bar 15, thus maintaining the pistons always in proper relation with the other operative parts.

If the device is to be used as a compressor, it will only be necessary to connect the pipes 12^a with the housings 10 so that the diaphragms 9 being closed in advance of the piston the movement of the piston will compress and drive a volume of air through the tube A which will be conducted away through the pipes 12^a.

It will be possible for this apparatus to be utilized either as a vacuum pump or air compressor or the two operations might be carried on simultaneously by the arrangement of the tubes as herein shown.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In an apparatus for producing a vacuum and compressing air, the combination of a tube having an upper portion extended at points to form inclosed chambers which communicate with the interior of the tube, lifters in the tube one in advance of the other and each having one end pivotally mounted in said chambers, and adapted to

close thereinto, said extended portions of the upper portion of the tube having at one end vertically disposed inclosed guides open from below, abutments slidably mounted in said guides having lower ends supported on the forward free ends of the lifters, an endless traveling carrier operable in the tube with its upper run traveling over the lower inner surface of the tube, pistons connected to the carrier and operable through the tube and adapted to engage said lifters, and fluid conductors connecting with the tube contiguous to said sliding abutments.

2. In an apparatus of the character described, the combination with a tube and an endless rope operable therethrough, of pistons carried by the rope, said pistons each having a rearwardly extending brace fixed to the rope, each of said pistons having a notch in the lower portion to admit the rope, and said tube having a plate secured centrally along its bottom slidably fitting said notches and maintaining the pistons in proper position, said plate having a lengthwise extending channel in which the rope is guided.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT A. SALLEE.

Witnesses:

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