

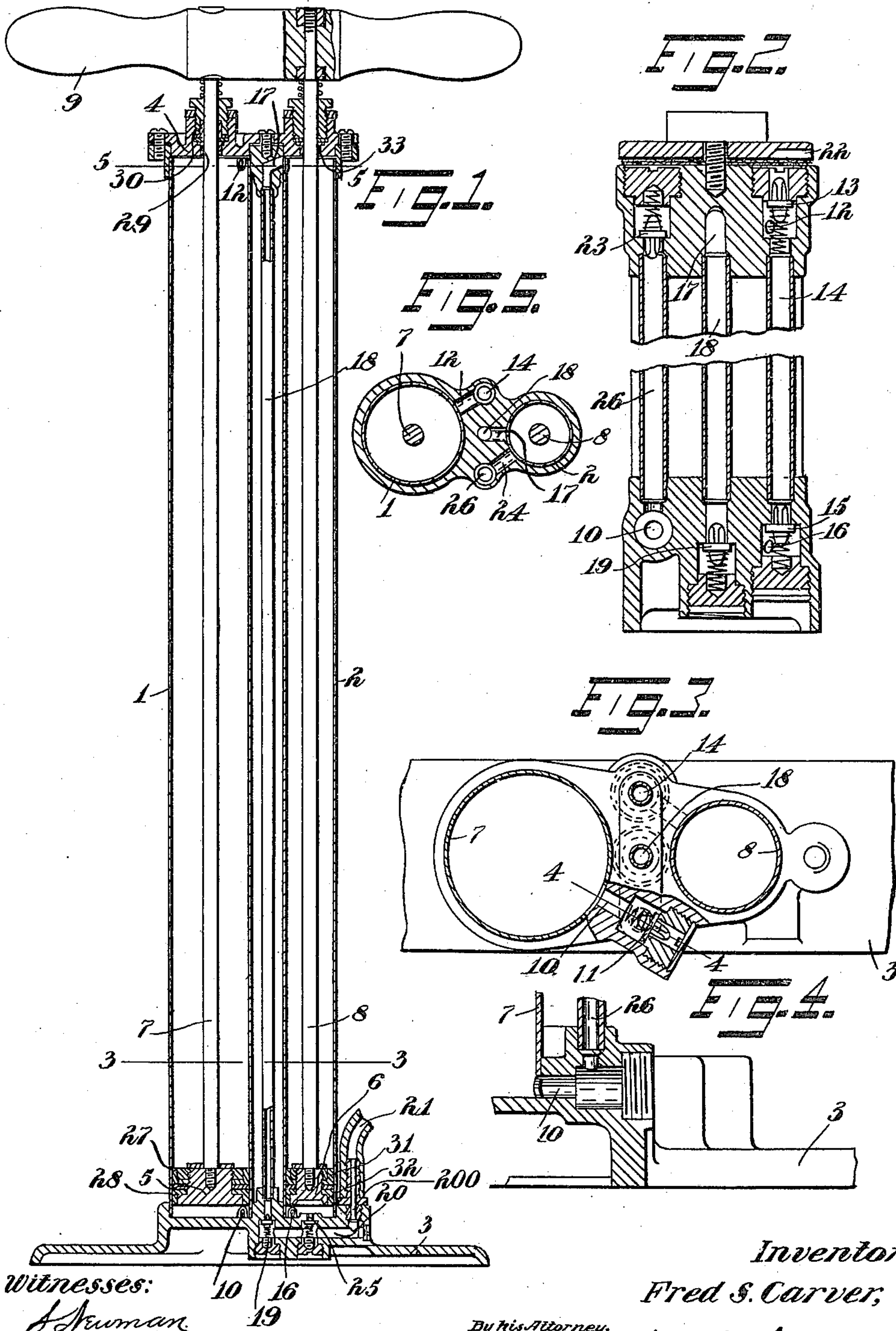
F. S. CARVER.

PUMP.

APPLICATION FILED APR. 29, 1909.

964,087.

Patented July 12, 1910.



Witnesses:

*Skuman*  
*H. D. Penney*

Inventor:

*Fred S. Carver,*

By his Attorney,

*C. H. Richards.*



# UNITED STATES PATENT OFFICE.

FRED S. CARVER, OF NEW YORK, N. Y.

## PUMP.

964,087.

Specification of Letters Patent. Patented July 12, 1910.

Application filed April 29, 1909. Serial No. 492,844.

*To all whom it may concern:*

Be it known that I, FRED S. CARVER, a citizen of the United States, residing in the borough of Manhattan, city and county of New York and State of New York, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to compound double acting air pumps and has for its object to provide an improved pump, particularly adapted for use in connection with the inflation of vehicle tires.

In this present structure there will be provided a high pressure and a low pressure cylinder arranged side by side in parallel relation, a pair of pistons with their piston rods will be provided and the piston rods will be connected together in some suitable manner, as for instance by means of a handle. The object of this being to move the pistons together. The low pressure piston, while moving in each direction, will force the air into the high pressure cylinder behind the piston in such cylinder, so that after the high pressure piston has completed its stroke in either direction a charge of air compressed from the first stage will be ready in such cylinder to be compressed out upon the opposite stroke of the piston in such high pressure cylinder.

In the drawings accompanying and forming part of this specification Figure 1 is a longitudinal section of a form of my improved pump. Fig. 2 is a section taken at about right angles to Fig. 1 on a somewhat enlarged scale, the parts being broken away in a middle zone. Fig. 3 is a cross section taken at about the plane of line 3—3 of Fig. 1. Fig. 4 is a detail showing one of the inlet valves to the low pressure cylinder; and Fig. 5 is a section on the line 5—5 of Fig. 1.

In the present illustration there is shown a low pressure cylinder 1 and a high pressure cylinder 2 of smaller diameter than the low pressure cylinder. These cylinders are arranged side by side and are disposed in parallelism, being held in such position by means of a base plate 3 and a top plate 4. The base plate in the present instance will afford the foot piece for the use of the operator, and the top plate will carry suitable stuffing boxes for the piston rods. There is shown a double acting piston 5 in the low pressure cylinder and a double acting piston

6 in the high pressure cylinder. The pistons will each be constructed for double action, that is for having an effective or compressing stroke in each direction. One practicable form of construction of double acting pistons is illustrated herein and will be described later. The pistons are provided respectively with piston rods 7 and 8 which are connected together by being connected to a handle 9.

Assuming the pistons to be in the position illustrated in Fig. 1, the handle upon being raised will raise both of the pistons 5 and 6. The piston 5 will draw air into the cylinder 1 through the inlet port 10 and past the valve 11 which it will unseat for this purpose. As the piston 5 rises it will compress the air in front of it in the low pressure cylinder 1 and force this out of the port 12 at the top of such cylinder. The valve 13 will be closed and the air will pass down the tube 14 unseating the valve 15, and passing by means of the port 16 into the lower end of the high pressure cylinder and behind the piston 6 as this is rising. During the rise of the high pressure piston 6 the air which is above it in the cylinder 2 will be forced out of the port 17 down the tube 18, unseating the valve 19, and passing out through the passage 20, past the valve 200, to the discharge. After the pistons have reached the top of the cylinder a charge of air at atmospheric pressure will be in the low pressure cylinder 1 below the piston 5, and a charge of compressed air will be in the high pressure cylinder 2 below the piston 6 therein. Upon the down stroke of both pistons, the low pressure piston 5 will draw in a charge of air through the inlet 22, unseating the valve 13 and passing into the cylinder 1 through the port 12. The air below the piston 5 will be compressed and forced through the port 10 when it will seat the valve 11 and pass up the tube 26, unseating the valve 23 and passing into the high pressure cylinder 2 at the port 24 at the rear of the piston 6 as this is descending. In its descent the piston 6 will force the air below it past the valve 25 and into the channel 20.

From the foregoing it will be seen that each movement of the handle moves both pistons in the same direction, and that each will act in both movements of reciprocation, thus we find that the pump is twin cylinder, compound, double acting. It will also be



seen that a strong and efficient structure is provided in which the parts are compactly arranged.

Mention is above made to the fact that the  
 5 pistons are double acting. The piston 5 is  
 in the present illustration provided with  
 cup leathers 27—28 projecting in opposite  
 directions so as to make this piston double  
 acting. The rod for this piston is packed  
 10 with oppositely directed packings 29 and  
 30. The piston 6 is also provided with  
 oppositely directed cup leathers 31—32, and  
 the rod for this piston is packed with a  
 packing 33. The packing of the pistons en-  
 15 ables each to compress the air at that side  
 toward which the piston is moving. In the  
 present illustration the cup leather at each  
 side will be effective upon piston movement  
 toward such side.

20 Having described my invention I claim:

1. In an air pump, the combination with  
 a low pressure cylinder and a high pressure  
 cylinder disposed side by side, of a double  
 acting piston in each cylinder, means for  
 25 carrying the cylinders, means for carrying  
 the pistons, one of said carrying means em-  
 bodying a handle and the other of said car-  
 rying means embodying a foot piece, each  
 of said cylinders being provided at each end  
 30 with a port, and tubes connecting the ports  
 at the respective ends of the low pressure

cylinder with the ports at the opposite ends  
 of the high pressure cylinder, said tubes  
 being disposed between the cylinders.

2. In an air pump, the combination with 35  
 a high pressure cylinder and a low pres-  
 sure cylinder, these being disposed side by  
 side, a double acting piston in each cylinder,  
 each of said pistons embodying a pair of  
 cup leathers projecting in directions oppo- 40  
 site one to the other, a piston rod connected  
 to each piston, a handle fast with both of the  
 piston rods, a foot piece fast with the lower  
 end of each of the cylinders, a single port  
 at each end of the low pressure cylinder 45  
 having an opening to the atmosphere, a back  
 pressure valve at such opening, a port at  
 each end of the high pressure cylinder, a  
 tube extending from the port at the lower  
 end of the low pressure cylinder to the port 50  
 at the upper end of the high pressure cyl-  
 inder and a tube extending from the port  
 at the upper end of the low pressure cylin-  
 der to the port at the lower end of the high  
 pressure cylinder, a discharge, and means 55  
 of communication between the respective  
 ends of the high pressure cylinder and the  
 discharge.

FRED S. CARVER.

Witnesses:

CHAS. LYON RUSSELL,  
 FRED. J. DOLE.