G. A. TOAZ.

PUMP.

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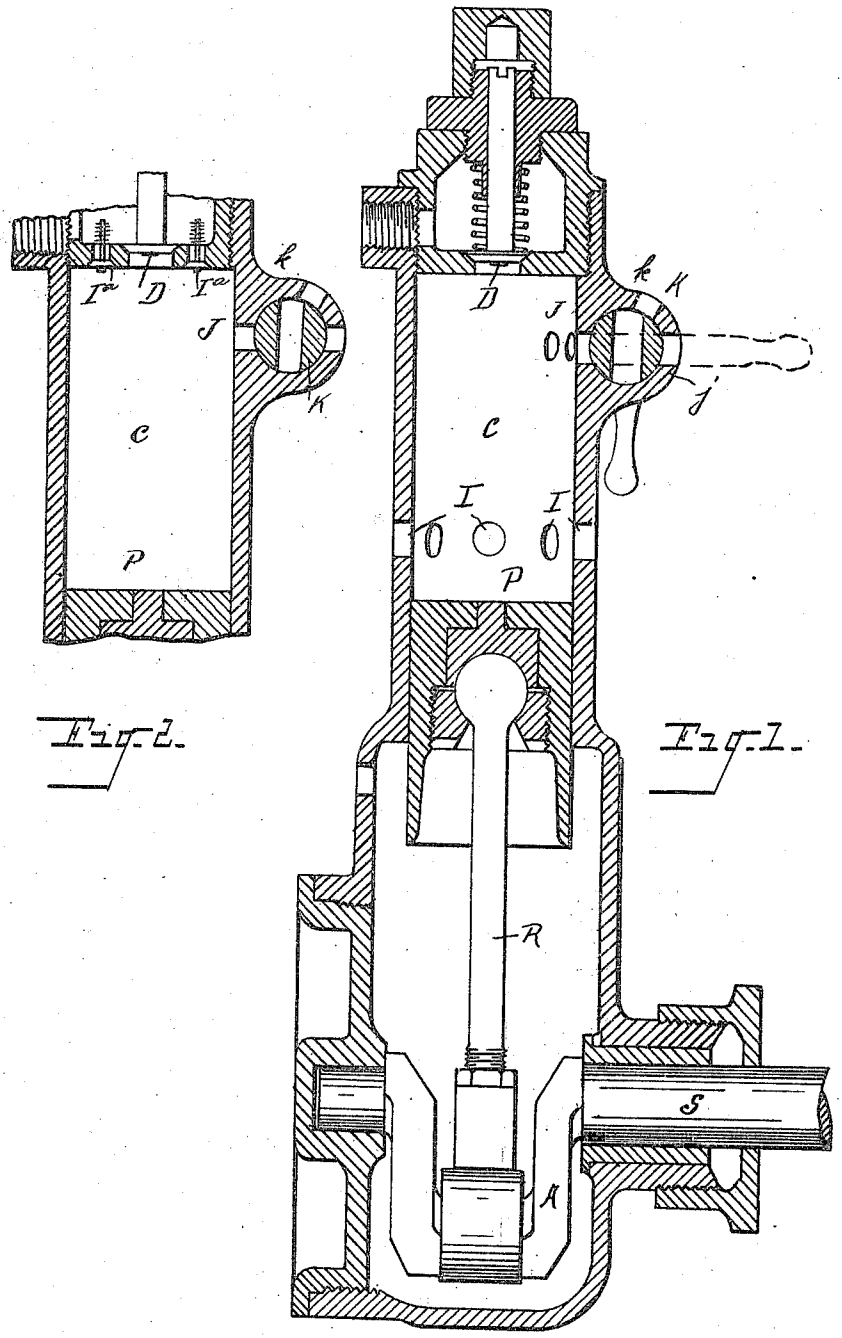
1,036,934. Patented Aug. 27, 1912.



Witnesses

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PUMP.

1,036,934. Specification of Letters Patent. Patented Aug. 27, 1912.

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To all whom it may concern:

Be it known that I, GLENN A. TOAZ, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Pumps, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to pumps and the object of my improvements is to provide an improved pump for air and one especially adapted to be used in connection with an automobile. I secure this object in the device illustrated in the accompanying drawing, in which,

Figure 1, is a vertical section of a pump embodying my invention. Fig. 2 is a detail sectional view showing a modified form of the same.

C, is the cylinder.

P, is a piston adapted to reciprocate in the cylinder C.

S, is the driving shaft, A is a crank thereon and R a connecting rod between the piston P and crank A.

D, is an automatic valve through the port of which the air is discharged by the pump.

I, I indicate apertures formed through the wall of the cylinder C at such a position as to be uncovered by the piston P toward the end of its downward stroke, the pump being shown as a vertical pump.

k is a chamber cast integral with or formed adjacent to the cylinder C toward the upper or discharge end thereof.

J, indicates apertures formed through the wall of the cylinder C toward the upper end thereof and connecting the interior of said cylinder with the chamber *k*.

K, is a cock turning in the chamber *k* adapted to put the apertures J into connection with the outer air through a port *j* or to close said port shutting off the connection between the outer air and the apertures J.

The operation of the above described device is as follows:—Power is communicated to the pump by rotating the shaft S which reciprocates the piston P by means of the crank A and connecting rod R. The cock K being closed, on the down stroke of the piston P a vacuum is drawn in the cylinder C, which is supplied by air from the atmosphere when the piston passes over and uncovers the apertures I. On the return stroke of the piston the apertures I are covered by the piston P and the air is compressed into the upper end of the cylinder and discharged through the port of the valve D in the usual way. Should a smaller pressure, or less air, be required than will be furnished by the pump at its full stroke, in the operation just described, the cock K is turned to its open position, then, on the downward stroke of the piston, a vacuum is drawn in the cylinder C above the apertures J until said apertures are uncovered by the piston P when atmospheric air rushes in to supply the vacuum. On its further downward stroke the piston P is followed by atmospheric pressure, the air passing through the apertures J, and such air is again discharged through said apertures until the same are closed by the piston P on its upward stroke, when the small quantity of air above the apertures J is compressed and discharged through the port of the valve D in the usual way.

There is always some clearance in a pump and therefore if the pump is left continuously running, it will not pump as high a pressure with the valves J open as with them closed, because the clearance remains the same in either case and and the quantity of air acted upon is less in the latter case.

Of course other ports might be supplied at different positions of the stroke of the piston J and the intermediate ports governed by cocks as the ports J are controlled in their action or an automatic inlet valve I^a may be located in the head, as shown in Fig. 2.

By this device the effective length of the stroke of the pump piston may be regulated.

What I claim is:—

1. In an air pump, a cylinder, a piston adapted to reciprocate therein, and means for adjusting the effective length of the stroke of said piston by putting said cylinder into connection with the atmosphere during a part of the compression stroke of the piston.

2. In an air pump, a cylinder, a piston adapted to reciprocate therein, a plurality of inlet ports located at different points of the stroke of said piston, the inlet port intermediate in said stroke communicating with the atmosphere, and means for con-

trolling the passage through the port intermediate in said stroke so as to form an opening from said cylinder during a part of the compression stroke of the piston.

3. In an air pump, the combination of a cylinder having apertures through its wall communicating with the atmosphere at different points of the stroke of the piston adapted to be covered and uncovered by the piston, and means for closing the intermediate aperture or opening the same, for the purpose described.

4. In an air pump, a cylinder, a piston adapted to reciprocate therein, an inlet port, means for controlling the opening through said port, an opening communicating with said cylinder, means for opening said opening at the commencement of and means for closing said opening toward the end of the compression stroke of the piston.

In testimony whereof, I sign this specification in the presence of two witnesses.

GLENN A. TOAZ.

Witnesses:

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