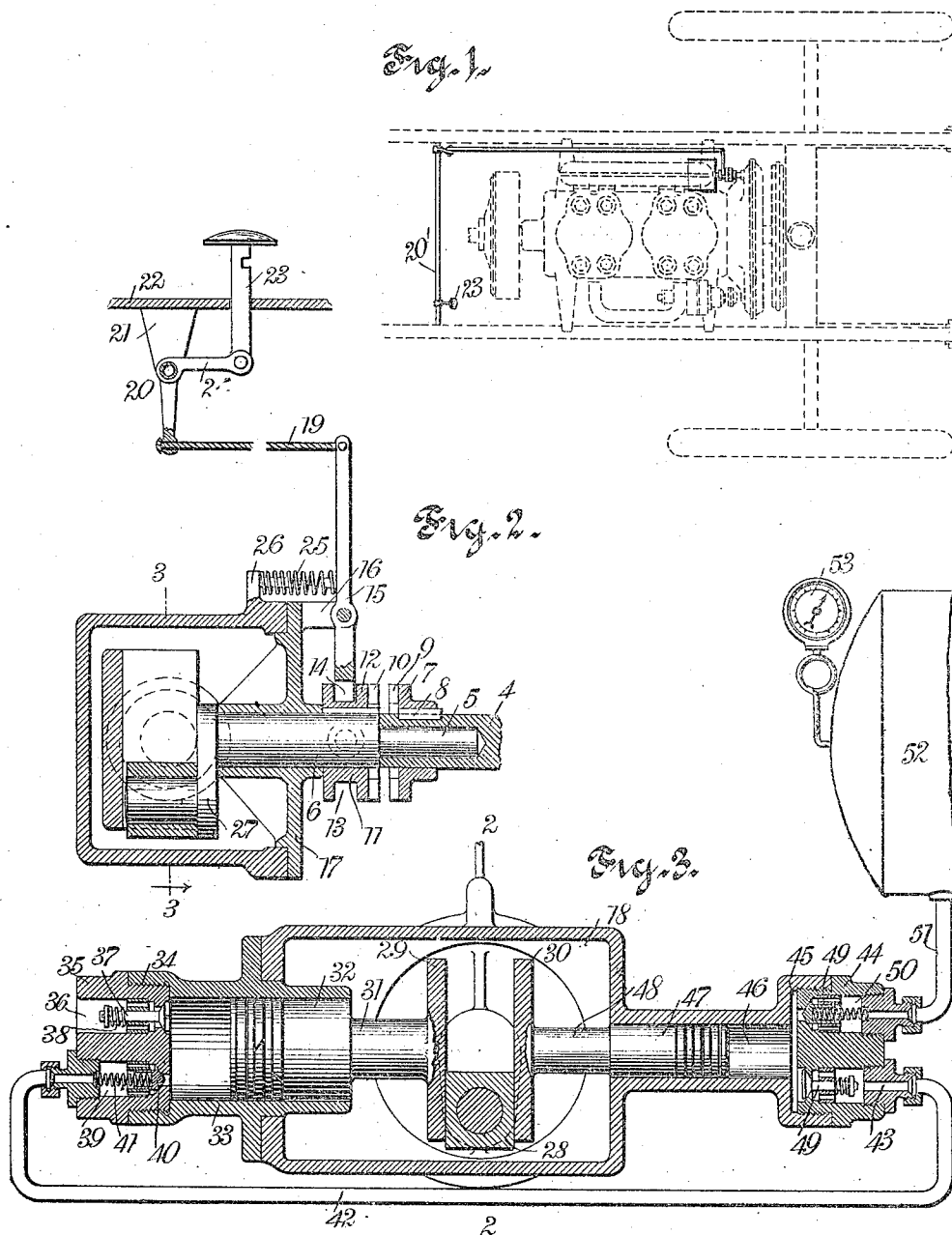


G. J. SPOHRER.
AIR PUMP,
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1,027,923.

Patented May 28, 1912.



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GREGORY JOHN SPOHRER, OF FRANKLIN, PENNSYLVANIA.

AIR-PUMP.

1,027,923.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GREGORY J. SPOHRER, a citizen of the United States, and a resident of Franklin, in the county of Venango and State of Pennsylvania, have invented a new and Improved Air-Pump, of which the following is a full, clear, and exact description.

My invention relates to a new and improved form of air compression pump, and more particularly relates to that form of air pump adapted to be installed on an automobile or other road vehicle in which the compressed air is used to actuate an engine starting mechanism, or for other purposes.

An object of my invention is to provide a pump simple in construction, of a compact form, and which may be connected at will to a driving element of the engine.

Another object of my invention is to position the reciprocating piston rods of my pump directly on a rotating member of the engine.

I attain the above outlined objects by disposing a pair of cylinders in axial alignment, each cylinder having a piston head therein and a stem projecting from said head, said stems extending toward each other, the ends of said heads terminating in bearing plates, between which bearing plates is disposed a sliding block attached by means of a clutch to the driving shaft of the engine, whereby the rotation of the shaft will reciprocate the piston heads on the cylinder. The outer end of each of the cylinders is closed by means of a cap, which cap has inlet and outlet spring-controlled valves so arranged that one stroke of the piston head will draw air into the larger cylinder and on the next stroke will force the air out of said larger cylinder into the smaller cylinder to be there compressed by the next succeeding stroke of the piston head in the smaller cylinder.

With the above and other objects in view, as will more fully hereinafter appear, the present invention consists in certain novel details of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of ref-

erence indicate corresponding parts in all the figures, and in which—

Figure 1 is a plan view looking down upon an automobile body and engine shown in outline, and showing in heavy lines, my pump in position; Fig. 2 is a vertical transverse section through the driving shaft and through a preferred embodiment of my invention taken on the line 2—2 of Fig. 3 and showing the clutch-actuating mechanism in elevation; Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2, looking in the direction of the arrow and showing part of the reservoir tank in elevation.

In the several figures, I have shown a main engine shaft 4, one end of which is recessed, into which recessed end is inserted the reduced end 5 of a shaft 6. Adjacent the end of the shaft 4 is a clutch member 7 rigidly fastened to the shaft by means of a key 8, said member having facing teeth 9, which teeth are adapted to be engaged by the teeth 10 on a clutch 11, which clutch is keyed at 12 to the shaft 6 and slidably mounted thereon. The clutch 11 has a peripheral groove 13 extending thereabout, in which groove is mounted the bifurcated end 14 of a lever 15 pivoted to a lug 16 projecting from the head 17 of a hollow casing 18. The end of the lever opposite the bifurcated end has attached thereto, one end of a flexible cord 19, the other end of which is connected to one arm 20 depending from a rod 20' mounted in brackets 21 depending from the platform 22 of the car, projecting through which platform and engaging an arm 24 rigidly attached to the rod 20' is a pedal 23 placed convenient to the operator. The clutch 11 is kept out of engagement with the clutch member 7 by means of a spring 25, one end of which bears on the lever 15 and the other end of which bears against a stud 26 projecting from the casing 18. The end of the shaft 6 opposite the clutch, has attached thereto, a crank arm 27 carrying a sliding block 28 square in cross section.

Disposed on opposite vertical sides of the block 28 is a pair of broad bearing plates 29 and 30. The plate 30 is connected to a piston rod 31, the piston head 32 of which reciprocates in a piston cylinder 33 extending part way into the casing 18 and in a direction at right angles to the length of the

shaft 6. The cylinder 33 is a single-acting cylinder, the end of the cylinder opposite the end in which the piston rod is inserted, being internally screw-threaded as shown at 5 34, at which screw-threaded end is inserted a cap 35, said cap having an inlet 36 extending therethrough, which inlet is controlled by a valve 37 held normally in closed position by a spring 38, and said cap is also bored at 10 39 to form an outlet controlled by a valve 40, which valve is retained on its seat by means of a spring 41. The valves 37 and 40 are maintained in opposite directions, so that the piston head moving to the right will 15 form a partial vacuum in the cylinder 33, permitting atmospheric pressure to open the valve 37 against the action of the spring 38 and permitting air to be admitted into the cylinder 33. On the return stroke of the 20 piston head 32, the pressure of the air will close the valve 37 and open the valve 40, forcing the air through a pipe 42, through an inlet 43 in a cap 44, which cap corresponds in construction to the cap 35 and is 25 threaded into an enlarged end 45 of a piston cylinder 46, which piston cylinder is in axial alinement with the cylinder 33 and is of materially smaller diameter than said cylinder.

30 Moving in the cylinder 46 is a piston head 47, connected by means of a stem 48 integrally connected to the bearing plate 30 hereinbefore described. The inlet 43 is controlled by a spring-pressed valve 49, 35 similar in construction to the valve 37 hereinbefore described. On the opposite side of the center of the cap 44, is a second spring-pressed outlet valve 49 similar in construction to the valve 40 hereinbefore described, 40 and controlling an outlet 50, attached to which outlet is a pipe 51 leading to a compressed air reservoir 52, the pressure in which reservoir is indicated by a pressure-indicator 53.

45 It is seen that the air is forced from the cylinder 33 through the pipe 42, raising the valve 49 off its seat and flowing into the cylinder 46. On the return stroke of the piston head 47, the air in the cylinder 46 is 50 compressed raising the valve 49 off its seat and forcing the air into the reservoir 52, from which it is conveyed from any desired fluid-actuating mechanism.

55 While a preferred embodiment of the invention has been described, it is to be un-

derstood that many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing 60 from the scope thereof. It is intended that all matters contained herein in the above description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense. It is also to 65 be understood that the language used in the following claims is intended to cover the full scope of the invention and is not to be given any narrower construction than the prior art demands, and that materials, sizes and relativities of parts are non-essential, 70 except as called for in the claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A pump, comprising a hollow casing, a 75 relatively small piston cylinder integral with one end of said casing, the outer end of said cylinder being enlarged, a cap in engagement with said enlarged end, said cap containing a plurality of valves, a relatively 80 large piston cylinder in axial alinement with said small cylinder, extending partially into said casing, the outer end of said large cylinder being enlarged, a cap in engagement with said enlarged end, and valves in said 85 cap.

2. A pump, comprising a hollow casing, a relatively small piston cylinder integral with one end of said casing, the outer end of said cylinder being enlarged, a cap in engagement with said enlarged end, said cap 90 containing a plurality of valves, a relatively large piston cylinder in axial alinement with said small cylinder, extending partially into said casing, the outer end of said large 95 cylinder being enlarged, a cap in engagement with said enlarged end, valves in said cap, a pair of independent piston rods, one in each piston cylinder and projecting toward each other into said casing and terminating in opposed broad bearing plates, and an actuating block in sliding engagement 100 with said plates, to reciprocate said piston.

In testimony whereof I have signed my name to this specification in the presence of 105 two subscribing witnesses.

GREGORY JOHN SPOHRER.

Witnesses:

H. G. READING,
WM. A. MALLORY.