

No. 640,676.

Patented Jan. 2, 1900.

J. LISTER, JR.
PNEUMATIC PUMP FOR BICYCLES.

(Application filed Oct. 14, 1895.)

2 Sheets—Sheet 1.

(No Model.)

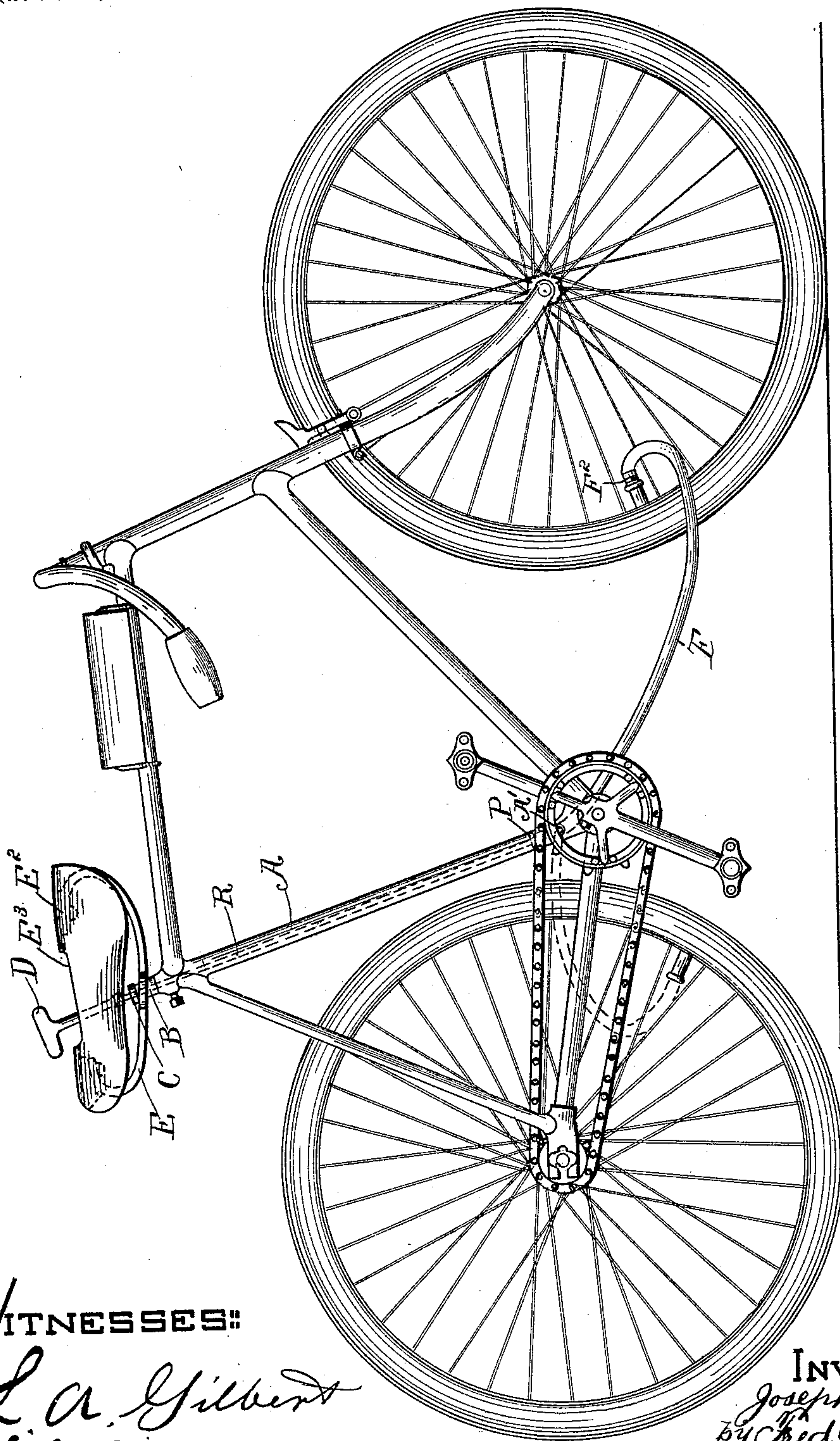


Fig. 1

WITNESSES:

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INVENTOR:
Joseph Lister, Jr.
by Fred W. Hersey
Atty.

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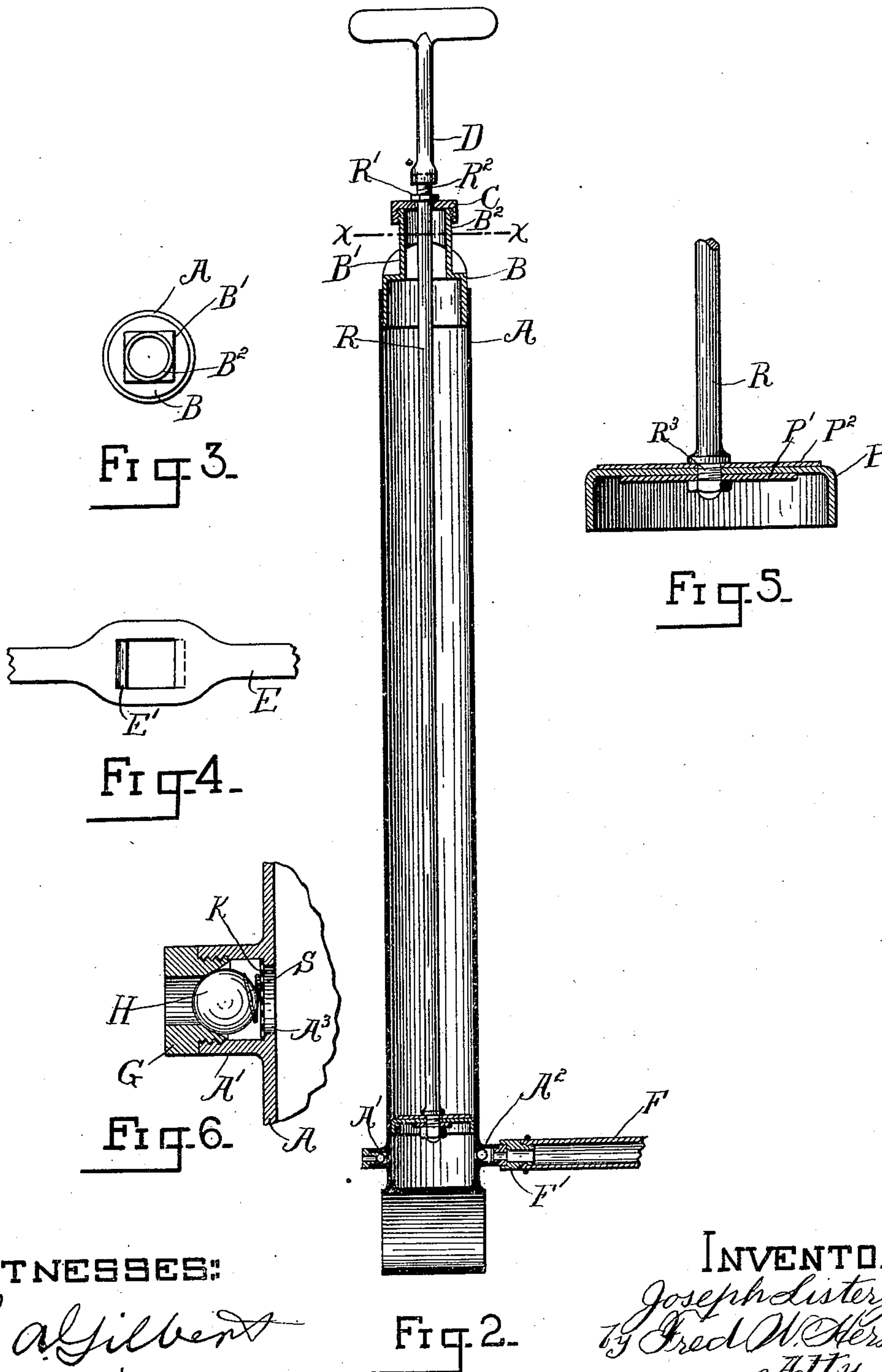
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2 Sheets—Sheet 2.



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FIG. 2.

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UNITED STATES PATENT OFFICE.

JOSEPH LISTER, JR., OF CHICAGO, ILLINOIS.

PNEUMATIC PUMP FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 640,676, dated January 2, 1900.

Application filed October 14, 1895. Serial No. 565,573. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH LISTER, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pneumatic Pumps for Bicycles, of which the following is a specification.

This invention relates to improvements in the devices by which the inflating of the pneumatic tires of bicycles is accomplished, it pertaining particularly to improvements in that class of bicycles wherein each is provided with a pump permanently secured to or forming part of the frame of the machine.

Heretofore use has been made or proposed of cylinders, valves, piston-rods, &c., of such nature that a successfully-operating device has been so expensive and so difficult to operate and keep in order that pumps of this sort have never gone into use. The purpose of the present invention is to provide such parts and construct them in such a manner that although the pump shall be perfectly efficient and durable the expense incident to its manufacture shall be so small as not to bar the application of the improvements to ordinary bicycles.

I illustrate my invention in the accompanying drawings, in which—

Figure 1 is a side elevation of a bicycle, showing the general relation of my invention to the machine. Fig. 2 is an enlarged sectional view of the tube forming the cylinder and the piston and rod which combine with it to form a pump. Fig. 3 is a detail plan view of the method of fastening the seat or saddle on. Fig. 4 is a detail plan view of the portion of the seat or saddle-frame fitting over the top of the tube. Fig. 5 is a sectional detail view of the piston, showing its preferable construction. Fig. 6 is a detail view of an inlet-valve for the pump.

Similar letters refer to like parts in the several views.

In the drawings, A represents the bracing-tube of the bicycle, which tube is used for the pump-cylinder.

B is the cap-piece, on which the support of the seat rests, which piece is shouldered into a square piece B', around which the seat-support E rests, the square portion being so made to prevent the support from turning.

The upper portion B² of the piece B is circular in shape and provided with a screw-thread on the outer side, and on this the cap C is screwed, said cap having in it a hole to allow the piston-rod R to pass through. This construction is fully illustrated by Figs. 2, 3, and 4 of the drawings. The piston-rod R is made of a small steel rod and has on its upper end a screw-thread R² and also a nut R', which is screwed down a short distance from the end of said rod and prevents it from going farther into the pump-cylinder than is desired. On the top of the piston-rod is screwed the handle D, which handle may be of any approved form or shape and is screwed on by placing it through the ventilation-hole E³ of the saddle E², as shown in Fig. 1 of the drawings. When not in use, this handle is removed and carried in the tool-bag of the machine or as desired.

The piston which I employ consists of the cup-shaped leather P, which is compressed or otherwise shaped to have the downward-extending flange and a cross or horizontal part. The latter is clamped on the top by the thin metal washer P² and on the bottom by a like washer P'. Through these extends the lower end R³ of the piston-rod R, which firmly holds them together by means of a projection and nut, as is clearly illustrated in Fig. 5 of the drawings.

In order to reduce the expense of the pump to the minimum, I avoid the necessity of boring out the cylinder-tube or of introducing a separate tube within the frame-tube to serve as a cylinder and so construct the valve and so arrange the inlet and outlet ports that the framing-tube itself can be utilized for the cylinder. The interior surfaces of these tubes are apt to be more or less irregular or slightly out of line; but with a valve of the character of that described and shown this is immaterial, as the flexibility of the relatively-prolonged flange of the leather at P insures such a tight fit of the valve to the inner surface of the tube that no material amount of air is allowed to escape upward past the valve.

I am aware that use has been made or proposed of a pump having an outer tube, a long interior tube with a piston at the lower end, and a threaded rod extending down into the upper ends of the tubes and adapted to be

connected to and disconnected from the inner tube said inner tube being of a diameter substantially that of the chamber in the outer tube and this interior tube being used for the purpose of having its lower end serve as an expanded support for the piston; but in my construction I dispense with such devices and reduce the parts to the utmost simplicity, I employing merely a small central rod extending continuously from the piston up through the top of the framing-tube: but nevertheless I make such a rod available for supporting a relatively wide cup-shaped leather piston by combining therewith the expanded washer-plates $P^1 P^2$, which in diameter approximate that of the tube, so that in both strokes the leather is supported properly in relation to the tube, so that it will work efficiently both for suction and compression. Moreover, in the earlier construction referred to no means were provided for preventing the piston from resting upon the lower end of the tube or from rising and falling when jolted by the machine, nor were there any means for closing the tube to prevent the access of dust and other foreign materials. Both these ends I accomplish by means of the cap or closing device and the stop on the piston-rod, which holds the piston in a suspended position when the handle is removed from the tube. I have also provided an inlet-valve and an outlet-valve of an advantageous character for this purpose, the former being shown at A^1 and the latter at A^2 . Near the bottom of the tube A is provided with small nipples and apertures at A^3 . The inlet-nipple is provided with a detachable thimble having a valve-seat at its inner end and screw-threaded, whereby it can be adjustably secured in place. H is a ball-valve adapted to bear in one direction against the valve-seat in the thimble G . It is held by a coiled spring S , which normally tends to push it outward. K is a perforated sheet of metal placed across the aperture A^3 . On this sheet the spring S rests, which spring bearing on the ball H is thus enabled to keep said ball in its socket in the piece G when there is no outward pressure. When not in use, a cap may be placed over the end of the inlet-tube to prevent dust entering. The valve just described is the inlet A^1 of the pump. The outlet A^2 is of exactly a reverse construction. On the outlet-valve is placed the coupling F^1 of the air-tube F , which air-tube may be coupled with the air-valve of the pneumatic tire by the coupling F^2 at the other end of

the tube, as is illustrated in Fig. 1 of the drawings. When not in use, the pump is in the position illustrated in Figs. 1 and 2, except that the handle D and air-tube F are removed. When it is desired to inflate the tire, the handle D is screwed on the top of the piston-rod, the air-tube is coupled to the air-valve of the front or rear tire, as is desired, and by the ordinary movement of a pump the tire may be quickly and easily inflated.

The stop-nut R^1 can be adjusted as desired, and the threaded part R^2 of the piston-rod can be as long as is necessary to provide for the proper downward travel of the piston.

It will be seen that by having the handle part D detachable from the piston-rod at a point outside of the cylinder I am enabled on one hand to utilize the entire length of the tube without requiring that the hand of the operator should pass through or below the saddle in order to drive the piston to the bottom of the tube, and on the other hand can when the pump is out of use avoid having any projection extending above the tube, so that when the bicycle is in use the saddle can be supported and related to the other parts in substantially the ordinary way, and, as above described, the upper narrowed part of the tube can be used to support the saddle.

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

1. In a bicycle, the combination with the frame-tube, A , the inlet and outlet valves at the lower end of said tube, the cap for closing the upper end of said tube having the angular-shaped tubular projection, B^1 , the saddle-support, E , mounted on said cap and held in position by said angular-shaped projection, a rod within the tube, A , and extending to points above the upper end of the projection B^1 , a piston on the lower end of said rod above the bottom of the tube, a handle adapted to be detachably engaged with the upper end of the piston-rod, and means for preventing said upper end of the piston-rod from passing into the tube when the handle is detached, substantially as set forth.

2. In a bicycle, the combination with the framing-tube, A , the piston therein, and the piston-rod, of the tubular extension secured to the upper end of the tube having the neck portion, B^1 , angular in section, and the closing device, C , substantially as set forth.

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Witnesses:

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