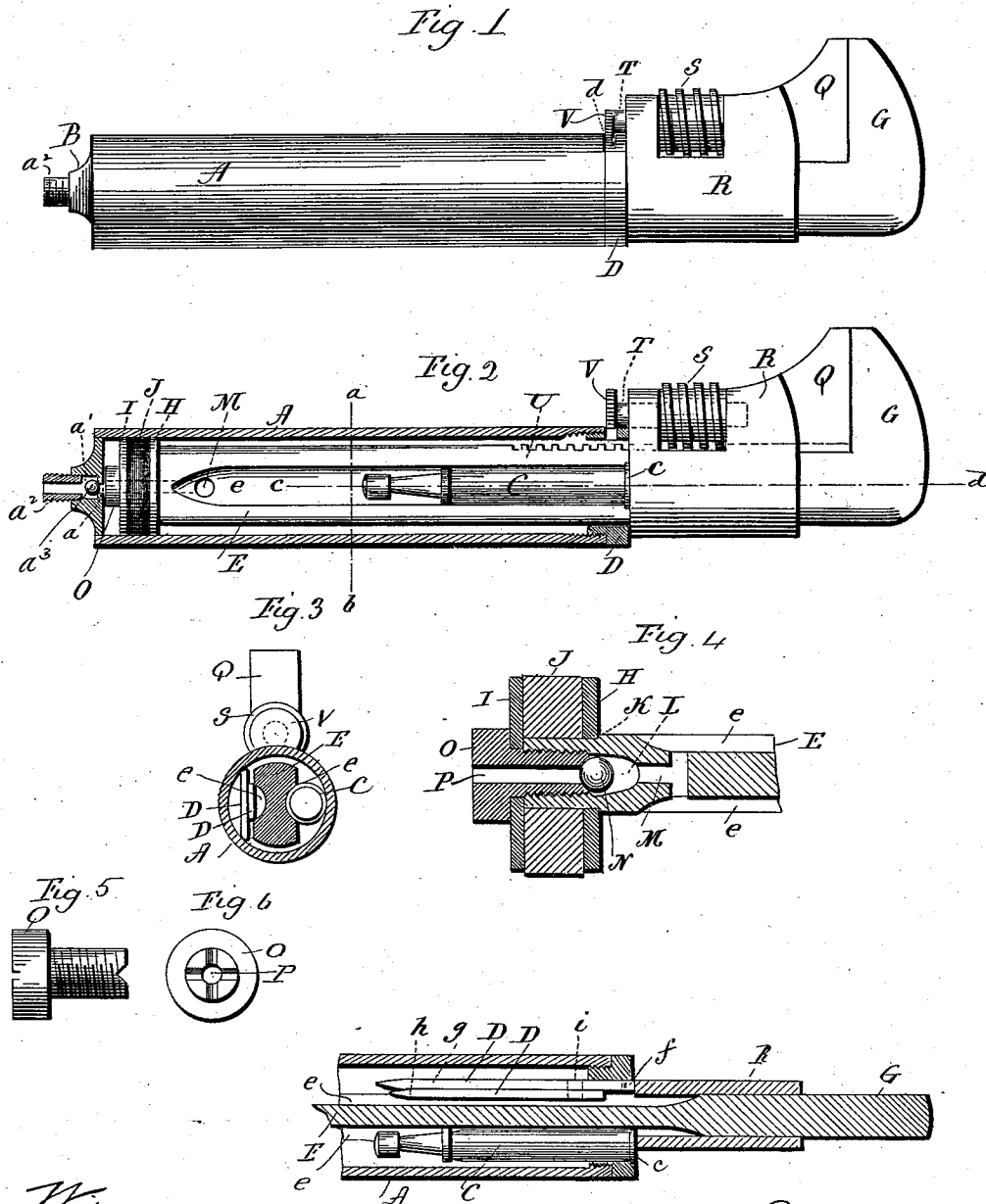


(No Model.)

D. H. PETRIE.
COMBINED AIR PUMP AND WRENCH.

No. 567,407.

Patented Sept. 8, 1896.



Witnesses,
J. N. Shumway
Lillian D. Kelsey

David H. Petrie.
Inventor.
By attys. Earle Seymour

UNITED STATES PATENT OFFICE.

DAVID H. PETRIE, OF MILFORD, CONNECTICUT.

COMBINED AIR-PUMP AND WRENCH.

SPECIFICATION forming part of Letters Patent No. 567,407, dated September 8, 1896.

Application filed December 9, 1895. Serial No. 571,475. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. PETRIE, of Milford, in the county of New Haven and State of Connecticut, have invented a new Improvement in a Combined Air-Pump and Wrench; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view in the closed position; Fig. 2, a side view showing the pump-cylinder in section; Fig. 3, a sectional view on the line *a b* of Fig. 2; Fig. 4, a sectional view of the inner end of the valve-stem and the valve; Fig. 5, a side view of the valve-screw; Fig. 6, an end view thereof, Figs. 4, 5, and 6 being enlarged; and Fig. 7, a sectional view on the line *c d* of Fig. 2.

This invention relates to an improvement in combination-tools, and particularly to a combination of tools for bicycles, the object being to combine a wrench and air-pump, and in the same casing provide spaces for screw-drivers and a coupling for connecting the pump with the tire-valve; and the invention consists in arranging a pump, the valve-stem of which is formed as an integral part of a wrench, and so that the wrench-head forms the handle for the pump and the pump-cylinder the handle for the wrench, and in certain details of construction, as will be hereinafter described, and particularly recited in the claims.

A represents the pump-cylinder, the outer end B of which is furnished with a discharge-opening *a*, enlarged at its outer end to form a chamber *a'*, threaded to receive an externally-threaded sleeve *a*², to which the coupling C may be attached for connecting the pump with the bicycle-valve. In the chamber *a'*, between the opening *a* and the sleeve *a*², a ball *a*³ is placed, which acts as a valve to close the opening *a* in the cylinder against back pressure. The inner end of the tube is partially closed by a cap D, through which the valve-stem E extends, said cap being also recessed to receive the flange *c* of the coupling C and the enlarged end *f* of the screw-

drivers. In the edge of the cap is a notch *d*, the purpose of which will hereinafter appear. The valve-stem E, which projects beyond the casing, terminates in a wrench-jaw G, and the sides of the stem are grooved to form clearance-spaces *e e* for the coupling C and screw-drivers D, and its inner end is reduced to receive rings H I, between which is placed a packing-washer J. Extending into the stem and through the reduced portion K is a chamber L, internally screw-threaded at its outer end, and opening into the inner end of this chamber is an air-passage M, the outer end of which extends transversely across the stem, so as to open into the grooves *e e*. The inner end of the chamber at the point of entrance of the passage M is formed with a valve-seat to receive a ball N.

O is a screw engaging with the threads of the chamber L and constructed with an opening P, which forms a continuation of the air-passage M through the screw into the pump-cylinder, the said screw also clamping the rings I H and washer J upon the end of the valve-rod. The inner end of the screw is also formed with notches, as shown in Figs. 5 and 6, which prevent the ball N closing the passage through it.

Q may be called the "fixed" jaw of the wrench and is formed with a sleeve R, which surrounds the stem E and carries a worm-screw S, which is mounted on a screw T to engage with a rack U, formed in one edge of the stem E. The outer end of the screw T is formed with a flat head V, a portion of which is removed, as shown in Fig. 1, to clear the cap D of the cylinder, which head when revolved will enter the notch *d*, before referred to, so as to positively lock the jaw Q to the cylinder, so that if the worm-nut S be turned its engagement with the rack D will force the jaw G outward, so as to open the wrench, or if moved in the opposite direction to close the wrench. To use the pump, this screw T is turned so that its head V is disengaged from the notch *d*, which permits the stem E to be moved back and forth in the cylinder. When drawn outward, the air which may enter around the stem enters through the air-passages M into the space between the outer end of the cylinder and the valve. Then,

when the stem is forced inward, the ball N moves to the opposite end of the cylinder, so as to close the air-passage M, and the air in the cylinder is forced outward through the screw and the end B of the cylinder. The screw-driver preferably employed consists of two blades *g h*, connected by a pivot *i*, so that they may be folded upon each other, as shown in Fig. 7, the outer blades *g* being formed with the enlarged end *f*, which takes a bearing in the top of the cap D, as before described, the inner blade *h* entering one of the grooves *e*, as shown in Fig. 3. On the opposite side of the stem the coupling C is placed, its flange *c* entering a corresponding recess in the head of the cap, the said screw-drivers and coupling being held in position by the sleeve R of the jaw Q. It will be seen that when the pump is to be used it will be in connection with the coupling C, so that that part is removed from the cylinder, and by simply removing the screw-driver the tool is free to be used as a pump, and when in position, and the jaw Q locked to the cylinder, the wrench may be used as a wrench of ordinary construction.

While I have particularly described the construction of my pump-valve, I would have it understood that any improved construction of pump-valves may be employed in lieu thereof. I therefore do not wish to be understood as limiting my invention to the particular construction herein shown and described.

Preferably the wrench will be used, as before described, by coupling the jaw Q to the cylinder, so that the jaw G becomes the movable jaw; but it will be readily understood that the jaw Q may be uncoupled from the cylinder and the stem drawn out and the said

jaw Q moved back and forth on the stem, thus becoming the movable jaw.

Instead of arranging the coupling C in the cylinder, as before described, it may be replaced by a small oil-can, in form corresponding substantially to the coupling shown.

I claim—

1. The combination with an air-pump, the stem of which is formed at its outer end with a wrench-jaw and with grooves on opposite sides, a cap applied to the open end of the pump-cylinder, and formed with an opening corresponding to said stem whereby it is guided for horizontal movement, said cap formed with a notch in one side, of a jaw mounted on said stem and carrying a worm-nut mounted on a screw, said screw formed with a head adapted to engage with said notch, and whereby said jaw may be interlocked with the cylinder, substantially as described.

2. The combination with a pump-cylinder formed with an outlet at its lower end, and a piston-stem formed at its outer end with a wrench-jaw and with grooves upon its sides, and a rack on one edge, a cap applied to the open end of the pump-cylinder and formed with an opening for the passage of said stem and with notches in the sides of said opening, a jaw mounted on said stem and carrying a worm-nut for engagement with the rack on the stem, and means for connecting said cap and jaw, substantially as described.

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

DAVID H. PETRIE.

Witnesses:

W. R. PETRIE,

FRED C. EARLE.