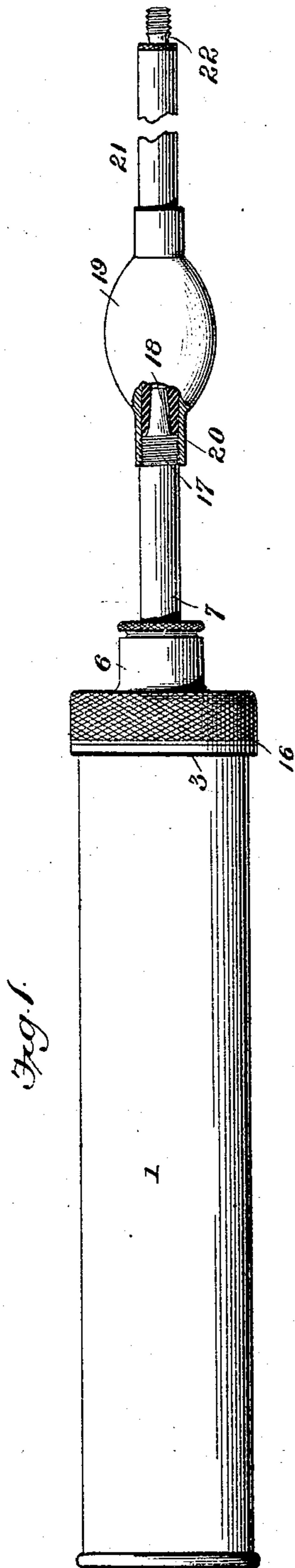


(No Model.)

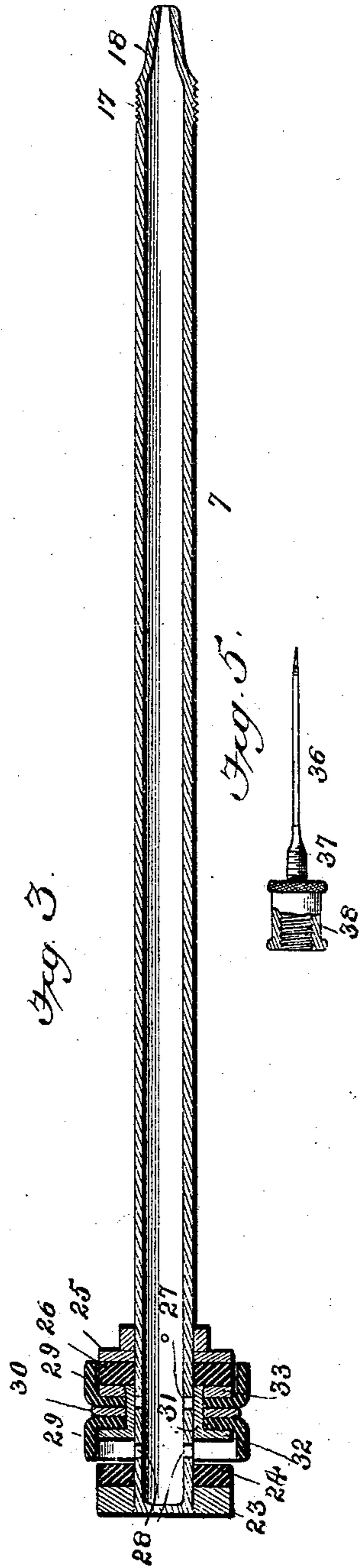
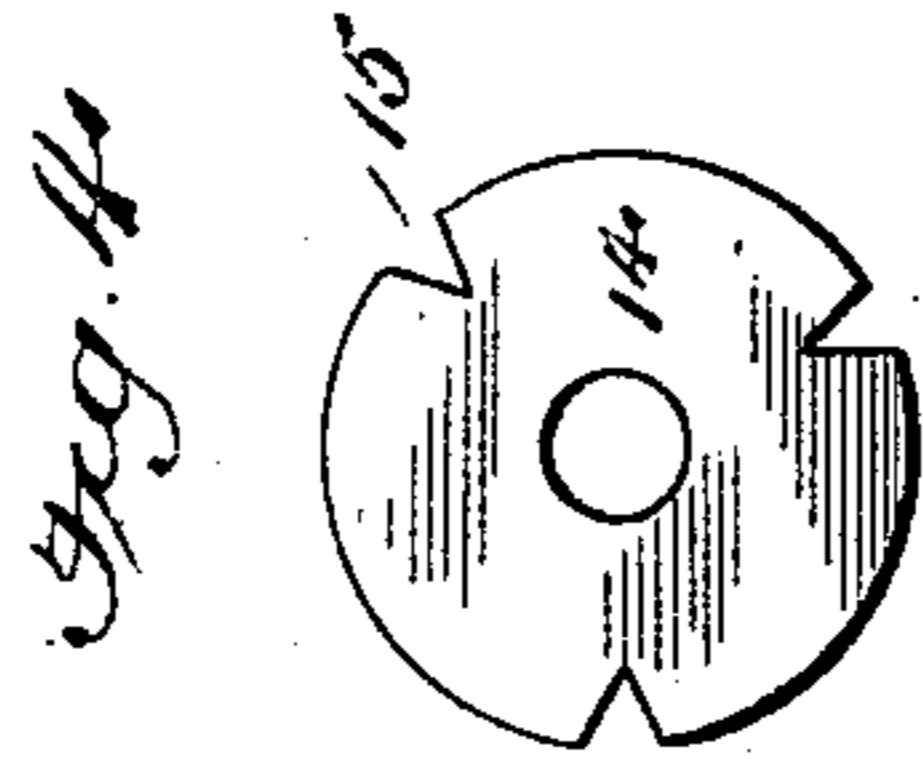
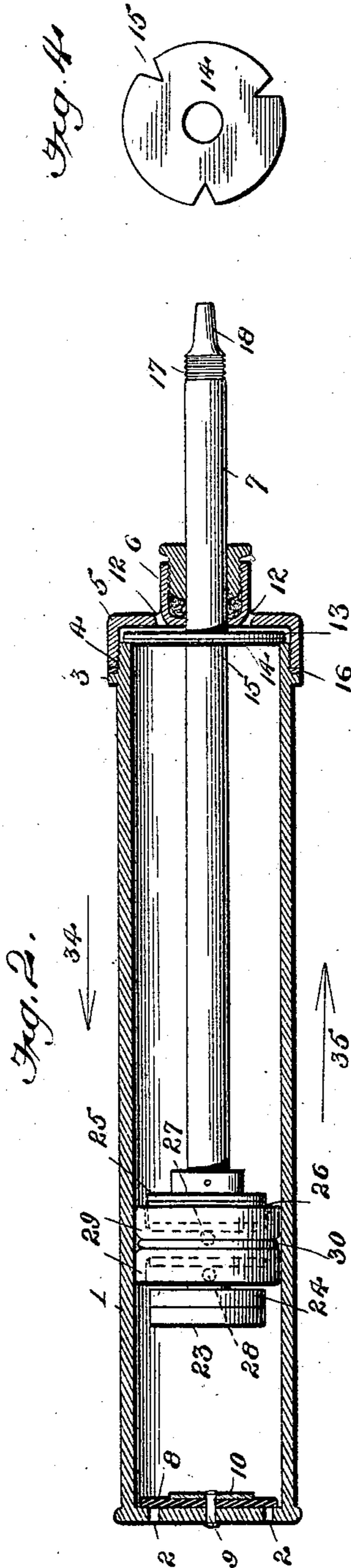
J. DICKENS.
HAND PUMP FOR INFLATING TIRES, &c.

No. 517,736.

Patented Apr. 3, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN DICKENS, OF NEW BRUNSWICK, NEW JERSEY, ASSIGNOR TO THE
DICKENS MANUFACTURING COMPANY, OF SAME PLACE.

HAND-PUMP FOR INFLATING TIRES, &c.

SPECIFICATION forming part of Letters Patent No. 517,736, dated April 3, 1894.

Application filed September 26, 1893. Serial No. 486,547. (No model.)

To all whom it may concern:

Be it known that I, JOHN DICKENS, a citizen of the United States, residing at New Brunswick, in the county of Middlesex and State of New Jersey, have invented new and useful Improvements in Hand-Pumps for Inflating Tires, &c., of which the following is a specification.

This invention has for its object to provide a novel and simple double-acting hand-pump for inflating pneumatic tires, the construction being such that the pumps can be so economically manufactured as to justify their gratuitous distribution to purchasers of velocipedes or bicycles.

To accomplish this object my invention consists in the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a hand pump embodying my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a detail longitudinal sectional view of the tube or tubular rod and the piston mounted thereupon. Fig. 4 is a detail plan view of the metallic plate for supporting the disk-valve at the front end of the cylinder; and Fig. 5 is a detail sectional view of an attachable needle for inflating foot-balls and other hollow objects.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a pump-barrel, which, as here illustrated, is in the form of a hollow cylinder provided at its rear end with air inlet orifices 2, and at its front end with an annular shoulder 3, and a screw-threaded portion 4 to which is screwed a cap or head 5 having a suitable stuffing box 6 through which passes the tube or tubular rod 7. The air inlet orifices 2 are controlled by a valve composed of a disk 8 of leather, or any other flexible or suitable material which is adapted to yield and permit atmospheric air to enter the rear end of the cylinder. The disk-valve 8 is confined in position by a pin or rivet 9 passing through the rear end of the cylinder

and through the valve, and a metallic washer 10, superimposed on the valve so that the central portion of the valve is substantially rigid and stationary, while the marginal portion is flexible and susceptible of yielding to admit air into the cylinder. The cap or head 5 is provided with air-inlet orifices 12, and between the front end of the cylinder and the interior of the cap or head is arranged a valve composed of a disk 13 of leather or other flexible or suitable material and a supporting-disk 14 of metal having notches 15 in its periphery and separate and disconnected from the disk 13. The screwing down of the cap or head 5 is limited by the shoulder 3, and, preferably, a packing 16 is interposed between the shoulder 3 and the flanged portion or rim of the cap or head, the construction being such that an air-tight joint is provided, and a suitable space is created for the movement of the parts 13 and 14, which constitute the valve, so that the valve can move away from the air-inlet orifices 12 to admit air into the front of the cylinder, which air passes around the periphery of the valve disk 13 and through the notches 15 of the plate 14 into the cylinder. The tube or tubular-rod 7 is provided at its outer end with a screw-threaded portion 17, and a conical tip 18 to connect with a handle 19 which is provided with attachments for connecting with the usual nipple of a pneumatic tire. The handle 19, as here shown, is circular in cross section and oblong in external configuration, so that it can be conveniently grasped in one hand, while the other hand is used to reciprocate the cylindrical pump barrel. The inner end of the handle 19 is provided with a short tubular section 20 to screw upon the threaded portion 17 of the tube or tubular rod 7. An elastic tube 21 extends through the handle 19, and is provided at its outer end with a screw-nipple 22 to connect with the nipple on the pneumatic tire, while the inner end of this elastic tube receives the conical tip 18 of the tube or tubular rod 7 in such manner that when the handle 19 is screwed upon the threaded portion 17, the conical tip 18 is forced into the elastic tube for the purpose of making a perfectly air-tight joint between the parts. The inner end of the tube or tubular-rod 7 is provided with a rigidly attached ring,

disk, or collar 23, to which is suitably secured a packing 24, and on the tube or tubular-rod, at some distance from the ring, disk or collar 23, is rigidly attached a ring, disk, or collar 25 having suitably secured thereto a packing 26 which faces the packing 24, and is at such distance therefrom that the piston hereinafter explained can move to a limited extent in the direction of the length of the tube or tubular-rod 7, for the purpose of alternately opening and closing the air-inlet ports or orifices 27 and 28.

The parts 23 and 24, and 25 and 26 constitute what may be termed packed rings, which are adapted to enter the opposite side portion of the piston, as will hereinafter appear. The piston is composed of two cup-shaped rings 29 composed of leather, or any other suitable material which is sufficiently flexible to secure a tight fit with the internal surface of the pump-barrel or cylinder 1. The cup-shaped rings 29 are mounted upon a sleeve 31 formed at one end with a collar 32, and attached at the opposite end to a collar 33, and between the cup-shaped rings is arranged a metal plate or disk 30 which serves to support the leathers or cup-shaped rings 29 and maintain them in proper working position relatively to each other, all in such manner that the parts comprising the piston are firmly united together, and such piston can move upon the tube or tubular rod in the direction of the length thereof to alternately open and close the air-inlet ports or orifices 27 and 28. When the piston is in the position exhibited by Fig. 3, the ports 27 are closed, and the packed ring 25, 26 enters the adjacent cup-shaped ring 29 so as to approximately fill the same and produce a tight joint between the packed ring and the collar 33, so that passage of air through the ports 27 is impossible. If the piston is moved, as hereinafter explained, to cover the ports or orifices 28 the packed ring 23—24 will enter the adjacent cup-shaped ring 29 to approximately fill the same and produce a tight joint with the collar 32, so that the passage of air through the ports or orifices 28 is impossible. When the pump-barrel or cylinder is moved by the hand in the direction of the arrow 34, Fig. 2, the disk-valve 13 closes the orifices 12, air enters the orifices 2, and the piston is automatically moved to uncover the ports or orifices 27 through which the air in the forward portion of the cylinder is forced into the tube or tubular rod 7 to the interior of the tire. On the reverse stroke of the pump-barrel or cylinder in the direction of the arrow 35, Fig. 2, the disk-valve 8 closes the orifices 2, air enters the orifices 12, and the piston moves to uncover the rear orifices 28 so that air flows into the tube or tubular-rod to the tire on the back stroke as well as on the forward stroke.

In practical operation the leathers or cup-shaped rings tightly fit the internal surface of the cylinder and the friction between the parts, in connection with the air pressure,

serves to move the piston on the piston-rod, or enables the piston-rod to move slightly lengthwise through the piston while the latter is temporarily in a stationary position.

In the manufacture of the hand-pump I entirely avoid screw-threading of parts of the piston, and am enabled to assemble and permanently connect the parts thereof by simply slipping the leathers 29 and leather supporting plate 30 on the sleeve 31, inserting one end of the latter into the collar 33 and rigidly and permanently fastening this collar by simply inserting a punch into the end of the sleeve to which the collar is applied.

The construction of the piston is such as to materially simplify the assemblage and permanent connection of its parts, whereby the expense of manufacturing this type of devices is materially reduced and they can be so economically made as to enable them to be gratuitously distributed or given away to purchasers of velocipedes or bicycles.

In Fig. 5 I have illustrated a needle which is designed to inflate foot-balls and other hollow objects which are to be inflated by forcing atmospheric air thereinto. The needle 36 is tubular and extends from the externally screw-threaded stem 37 of an internally threaded thimble 38, which latter is adapted to screw upon the threaded part 22 of the elastic tube 21, so that the needle can be caused to penetrate the foot-ball or other hollow object, and then atmospheric air can be forced thereinto by reciprocating the pump-barrel or cylinder on the tube or tubular rod. The needle can be conveniently carried by inserting it into the screw-threaded part 22, and screwing the threaded stem 37 of the needle into the said threaded part 22, as will be obvious without further illustration.

I have described my invention with special reference to inflating the pneumatic tires of wheels, but it is obvious that the pump can be used to inflate other objects, and for many other purposes not necessary to specifically mention.

Having thus described my invention, what I claim is—

1. A hand-air pump for inflating tires and other objects, consisting of a tube or tubular rod having at its outer end portion suitable means to connect with the object to be inflated, and at its inner end portion provided with separated orifices for the inlet of air thereinto, a piston movable on the tube or tubular-rod and composed of a sleeve having a fixed collar, two oppositely disposed cup-shaped packings and a collar permanently fastened to the sleeve, and a hand-operated cylinder adapted to reciprocate longitudinally of the tube or tubular-rod and having valved air inlets at its opposite end portions, substantially as described.

2. The combination in a hand-air pump for inflating tires, of a tube or tubular-rod having at its outer end portion suitable means to connect with the object to be inflated, and

at its inner end portion provided with separated ports or orifices for the inlet of air thereinto, packed rings mounted on the tube or tubular support and between which the said
5 ports or orifices are located, a piston movable on the tube or tubular rod and composed of a sleeve 31 having fixed collar 32, two oppositely disposed cup-shaped packing rings 29, a supporting plate 30 arranged between and
10 supporting the packing rings and a collar 33 attached to one end of the sleeve, and a hand-operated cylinder adapted to reciprocate longitudinally of the tube or tubular-rod and having valved air inlets at its opposite end
15 portions, substantially as described.

3. The combination in a hand-air pump for inflating tires, of a tube or tubular-rod having at its outer end a screw-threaded portion,

and a conical tip, a hand-operated cylinder adapted to reciprocate on the tube or tubular rod and having valved air inlets, means for controlling the flow of air from the cylinder into the tube or tubular-rod, a handle attached to the screw-threaded portion of the tube or tubular-rod, and an elastic tube extending
25 through the handle and into which the conical tip of the tube or tubular rod extends, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN DICKENS.

Witnesses:

ALBERT H. NORRIS,
THOMAS A. GREEN.