

W. S. STAPLEY.

TIRE PUMP.

APPLICATION FILED NOV. 8, 1909.

959,894.

Patented May 31, 1910.

Fig 1.

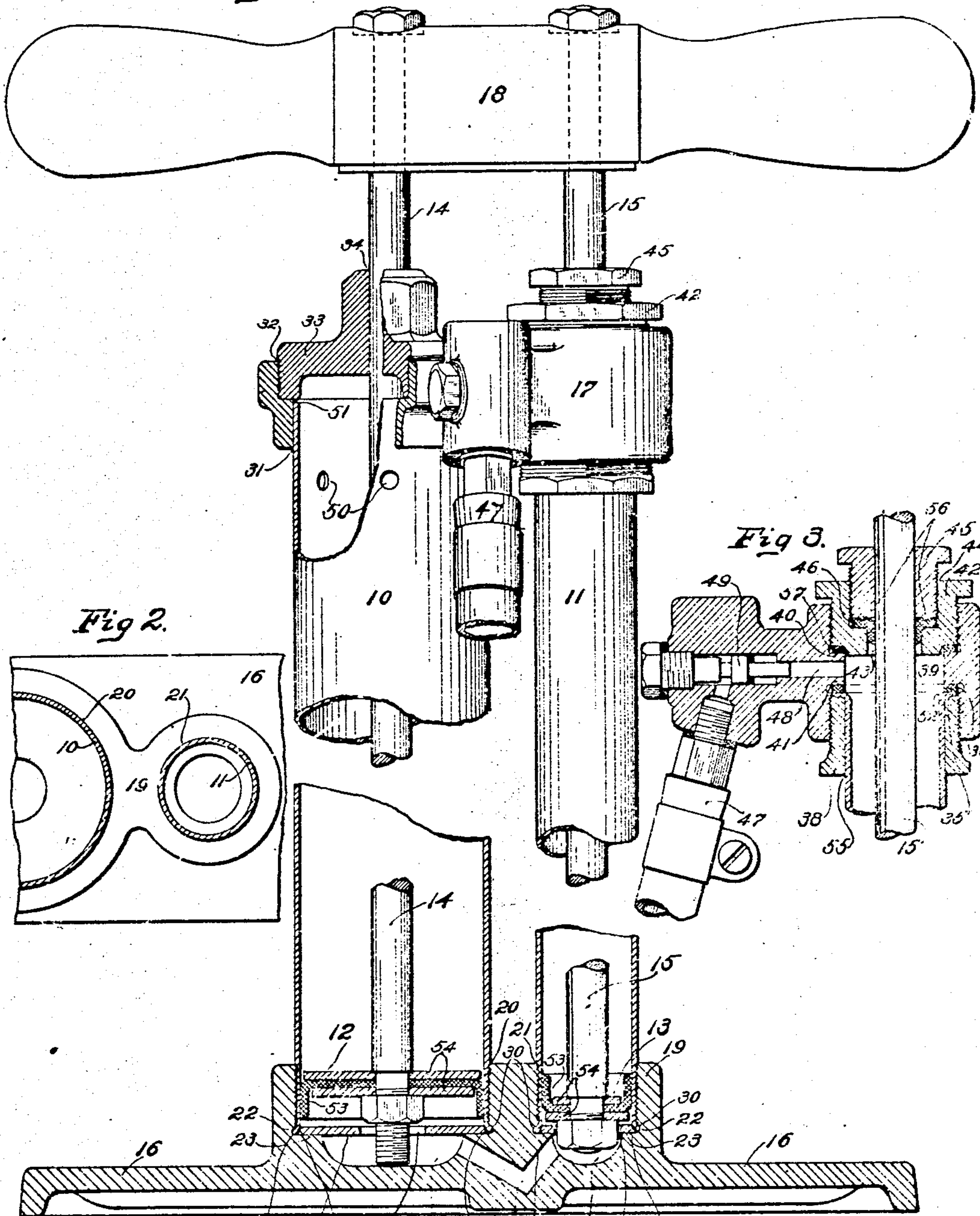


Fig 2.

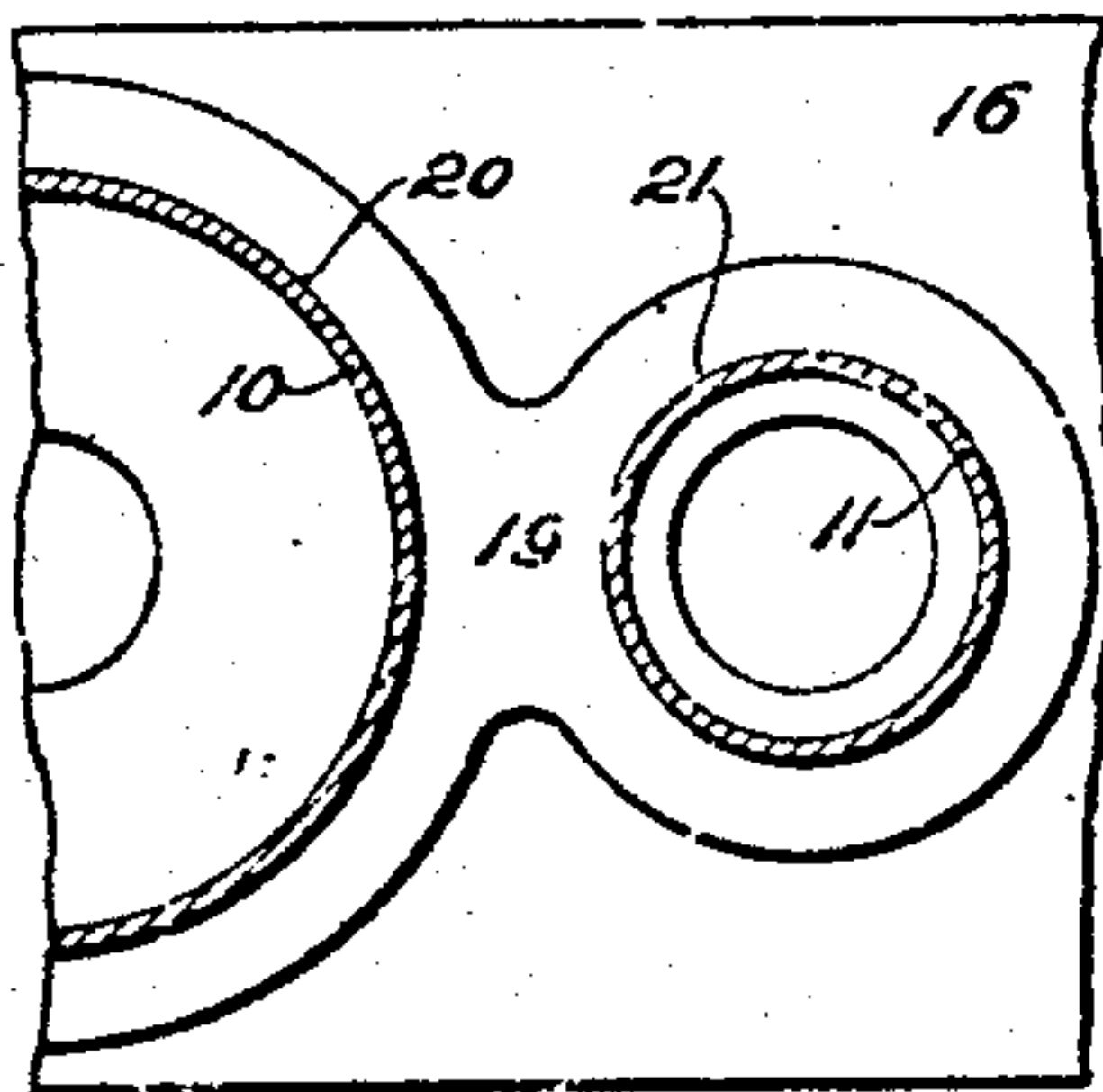
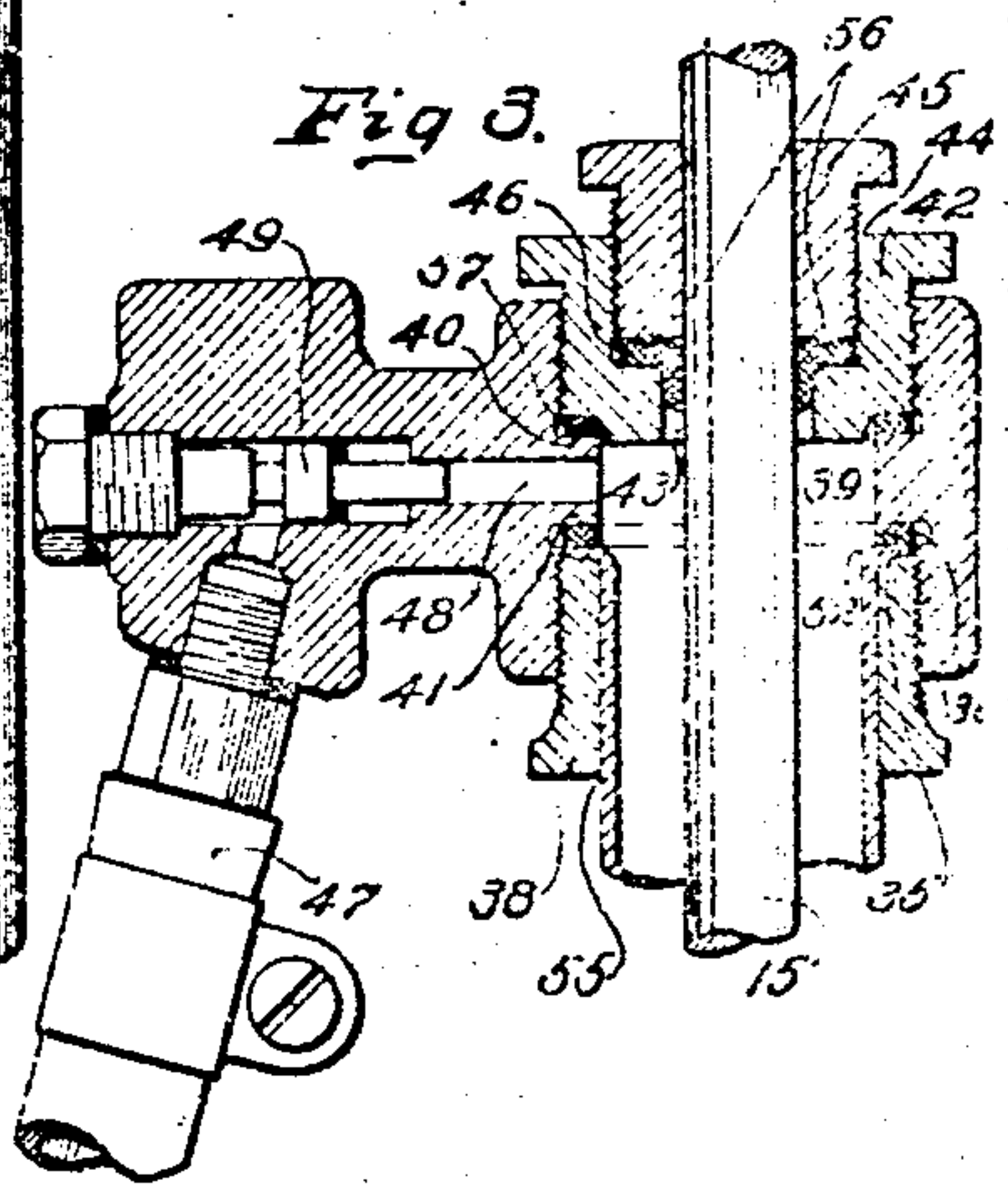


Fig 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## TIRE-PUMP.

959,894.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed November 8, 1909. Serial No. 526,769.

*To all whom it may concern:*

Be it known that I, WILLIAM S. STAPLEY, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Tire-Pumps, of which the following is a specification.

This invention relates to double-acting hand air-pumps, so called, adapted for general use and especially adapted for inflating automobile tires, and the invention has for its object to produce a two-cylinder pump in which the cost of construction shall be reduced to the minimum and which while having perfectly tight joints shall be so constructed that the pistons may be removed without disturbing the permanent parts of the structure, the cylinders being rigidly and permanently secured to the base.

With these and other objects in view I have devised the novel pump which will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawing forming a part of this specification, Figure 1 is a view partly in elevation and partly in vertical section, illustrating the construction and operation of my novel pump; Fig. 2 a partial plan view of the base showing the cylinders in horizontal section; and Fig. 3 is a detail sectional view showing the connection of the small cylinder with the cap.

10 denotes the large cylinder, 11 the small cylinder, 12 the large piston, 13 the small piston, 14 the large piston rod, 15 the small piston rod, 16 the base, 17 the cap and 18 the handle which is rigidly secured to the two piston rods.

An important feature of the invention is that both cylinders are rigidly and permanently secured to the base. This I accomplish in the manner which I will now describe. The base is shown as provided with a raised hub 19 having threaded sockets 20 and 21 to receive the large and small cylinders respectively, the lower ends of which are correspondingly threaded. At the base of each socket is a circumferential enlargement 22 and a shoulder 23, and below the shoulder in socket 20 is a recess 24 and below the shoulder in socket 21 is a recess 25.

26 denotes an air passage leading from recess 24 to recess 25.

27 denotes steel washers which are made of

slightly less diameter than the corresponding circumferential enlargements 22, are provided with central holes 28 and with upwardly and inwardly beveled edges as at 29. The cylinders are secured in place by screwing them down forcibly upon the steel washers. When the ends of the cylinders in the turning in movement engage the beveled edges of the washers they are flanged outward into the peripheral recesses as at 30 filling the enlargements, making perfectly tight joints and rigidly and permanently securing the cylinders to the base.

Another important feature of the invention is that the cap is detachably secured to the upper ends of the cylinders so that it may be readily removed and the pistons drawn out. The cap is provided in its under side with an unthreaded hole 31 which receives large cylinder 10 freely and in its upper side with a corresponding larger hole 32 which is threaded to receive a correspondingly threaded screw plug 33 having a central hole 34 through which the large piston rod 14 slides freely, it being unnecessary to make a tight joint at this place for the reason that air is taken in at the upper end of the large cylinder. In case of the small cylinder it is required that it be attached to the cap in such a manner as to be readily detachable and at the same time that the joint be air-tight. This I provide for by the construction which I will now describe. The cap is provided with a hole 39 through it in which are upper and lower circumferential shoulders 40 and 41, the portions of the hole above and below the shoulders being threaded. The upper end of the small cylinder is provided with an outwardly turned flange 35 corresponding with lower shoulder 41, a packing washer 36 being interposed between the flange and shoulder. The flange is clamped tightly against the packing washer and a perfectly tight joint is formed by means of a screw plug 38 engaging hole 39 from the under side of the cap and having a hole 55 through which the cylinder passes, the end of the screw plug engaging the flange, as clearly shown in Fig. 3. A screw plug 42 engages hole 39 from the upper side of the cap, a packing washer 57 being interposed between the screw plug and shoulder 40. This plug is provided with a hole 43 through which small piston rod 15 passes freely and with a



threaded hole 44 which receives a gland 45. A packing washer 46 between the end of the gland and the base of hole 44 forms a stuffing box about the piston rod and insures a tight joint. The gland is preferably provided with a circular rib 56 which is forced into the packing washer.

The operation is as usual in pumps of this character. Air from the small cylinder passes to a nozzle 47 through a passage 48 in which is a slide valve 49. During the down stroke of the pistons, air is received behind the large piston through holes 50 and the air before the large piston is forced through passage 26 into the small cylinder and past the small piston and out through passage 48 and the nozzle. During the up stroke, air passes the large piston freely and air behind the small piston is forced out through passage 48 and the nozzle. To remove the pistons it is simply necessary to remove gland 45 and screw plugs 33 and 42 and then draw the pistons out from the cylinders. It will be noted that the upper end of the large cylinder is beveled outward as at 51 and that the upper end of the small cylinder is rounded outward as at 52 in forming the flange for convenience in inserting the pistons into the cylinders again after they have been repaired or renewed. The pistons may be of any ordinary or preferred construction. I have shown pistons comprising cup-shaped flexible washers 53 which are clamped between metal washers 54, the cup-shaped washer of the large piston facing downward and the cup-shaped washer of the small piston facing upward so as to permit passage of air in both instances on the return stroke, which is the up stroke of the large piston and the down stroke of the small piston. The downward movement of the pistons is shown as stopped in the present instance by the engagement of the lower end of the large piston rod with the bottom of recess 24.

Having thus described my invention I claim:

1. In a pump, the combination with a base having a threaded hole, a circumferential enlargement below the thread, and a shoulder below the enlargement and a metallic washer of slightly less diameter than the enlargement which rests on the shoulder and is provided with an upwardly and inwardly beveled edge, of a threaded cylinder screwed into the hole and permanently secured to

the base by flanging the end thereof outward between the beveled edge of the washer and the wall of the enlargement.

2. In a pump, the combination with a base, large and small cylinders secured thereto and pistons and piston rods, of a cap which receives the upper ends of the cylinders and screw plugs through which the piston rods pass so that the pistons may be removed without detaching the cylinders from the base or the cap from the cylinders.

3. In a pump, the combination with a base, large and small cylinders secured thereto and pistons and piston rods, of a cap having holes to receive the upper ends of the cylinders, a screw plug in one of said holes through which the large piston rod passes, a screw plug in the other hole provided with a stuffing box through which the small piston rod passes and means for securing the small cylinder to the cap with an air-tight joint.

4. In a pump, the combination with a base, large and small cylinders secured thereto, said small cylinder having at its outer end an outwardly turned flange, pistons in said cylinders and piston rods, of a cap having holes to receive the upper ends of the cylinders, a screw plug in one of said holes through which the large cylinder rod passes, upper and lower shoulders in the other hole, a packing washer between the flange of the small cylinder and the lower shoulder, a screw plug engaging said flange, a packing washer upon the upper shoulder, a screw plug engaging said washer and a stuffing box in said screw plug through which the small piston rod passes.

5. In a pump, the combination with a base and a cylinder secured thereto and having at its upper end an outwardly turned flange, of a cap having a hole with upper and lower shoulders, a packing washer between the flange of the cylinder and the lower shoulder, a screw plug engaging said flange, a packing washer on the upper shoulder, a screw plug engaging said washer and a stuffing box in said screw plug, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM S. STAPLEY.

Witnesses:

A. M. WOOSTER,  
S. W. ATHERTON.