M. B. ESLINGER.

PUMP.

APPLICATION FILED DEC. 13, 1920.

1,412,279.

Patented Apr. 11, 1922.

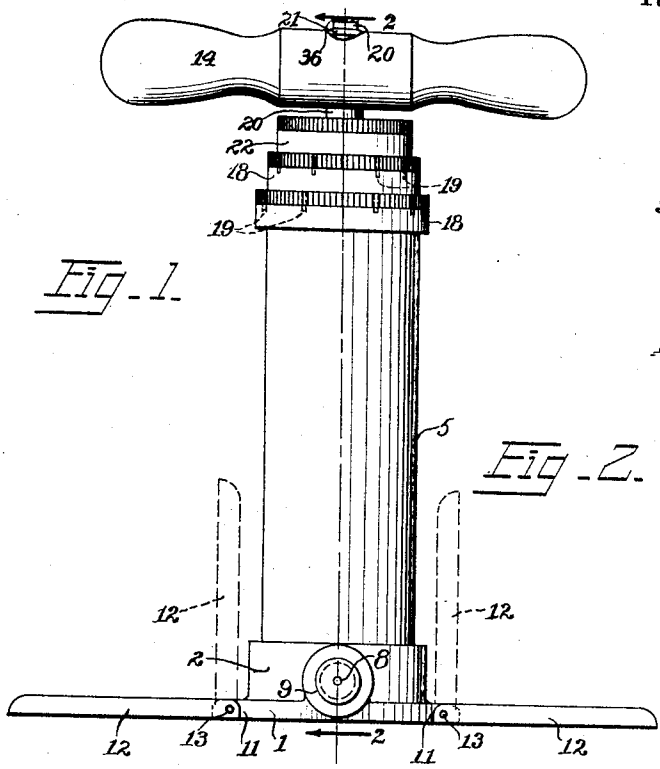


Fig. 1.

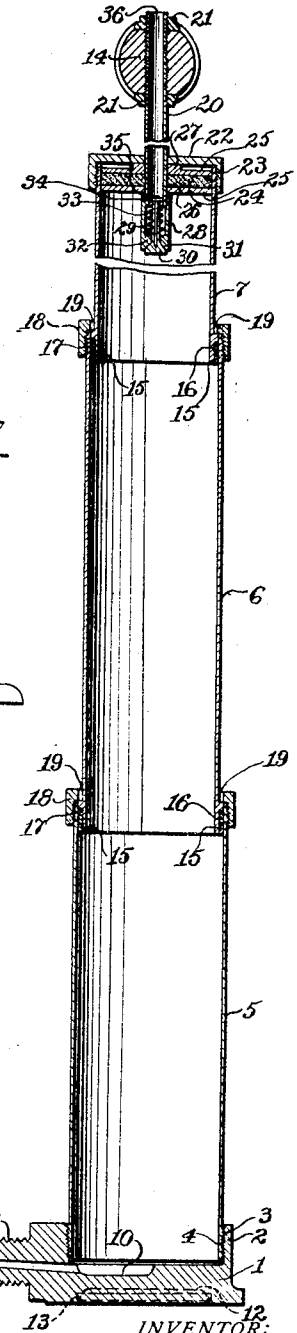


Fig. 2.

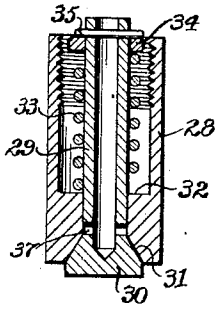


Fig. 3.

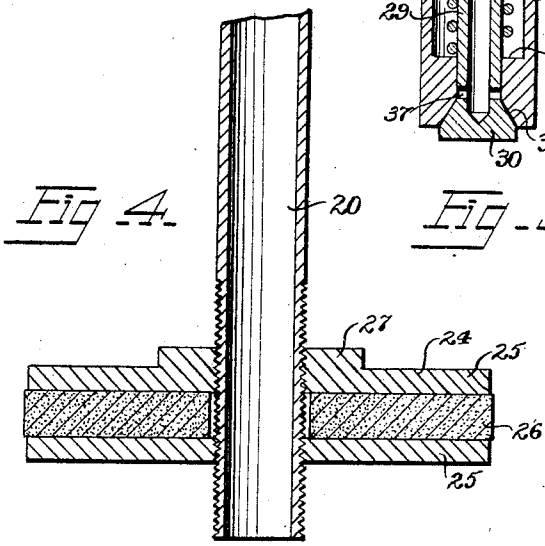


Fig. 4.

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UNITED STATES PATENT OFFICE.

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PUMP.

1,412,279. Specification of Letters Patent. Patented Apr. 11, 1922.

Application filed December 13, 1920. Serial No. 430,239.

To all whom it may concern:

Be it known that I, MELVIN B. ESLINGER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention is a pump and is especially adapted for inflating pneumatic tires for motor-vehicles and the like. Its especial advantages are collapsibility (enabling it to fit in an ordinary automobile tool-box or other small space) and the more rapid introduction of air into the tube or the like to be inflated. It can be used for inflating footballs, and for that purpose is especially convenient, because of the small space that it occupies during transportation. It may be used, also, for quick inflation of air-mattresses, air-seats or cushions, bicycle tires, and other useful purposes.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur,

Figure 1 is a front elevation;

Figure 2 is a vertical sectional view;

Figure 3 is a vertical sectional view through the valve (being on an enlarged scale compared to Figure 2); and

Figure 4 is an enlarged detail in section of the plunger.

The base 1 is a casting having a collar 2 internally threaded at 3, to co-operate with threads 4 on the lower end of cylinder 5, which is telescoped by cylinder 6, which, in turn, is telescoped by cylinder 7. A passage 8 leads out of base 1 through nipple 9, externally screw-threaded for attachment to a tube or other suitable device. Passage 8 leads internally to the chamber 10 in base 1, which chamber immediately underlies the hollow interior of cylinders 5, 6, and 7. Chamber 10 consists of a recess formed in the casting constituting base 1.

To the lugs 11 extending from and preferably cast integral with base 1 are pivoted the wings 12 by pins 13 or other suitable means. The user of the pump will stand on the wings 12 while using the pump, in order to hold it steady and against the upward pull on handle 14.

The handle 14, wings 12, cylinders 5, 6 and 7, and other parts may be of any suitable size, and this pump may be manufactured in various sizes.

A grooved collar 15 is sweated or screwed on the lower end of cylinder 6 and another on the lower end of cylinder 7, and packing 16 is contained in the said groove. The upper end of cylinder 5 and the upper end of cylinder 6 are externally threaded to co-operate with the internal threads 17 in collars 18, adapted to screw down to and abut against the collars 15 and to rest thereon and upon the top edge of the next lower cylinder, which edge fits tightly into the annular crevice between the depending flange of collar 18 and the packing 16 and collar 15, the said combination of parts thus forming a very tight joint. To prevent the telescoping cylinders becoming airbound while moving outwardly, a tiny perforation 19 is bored through or formed in each collar 18.

To tube 20, which is threaded at both ends, is attached handle 14 by nuts 21 or other suitable means, the said nuts being countersunk in the said handle 14.

Cap 22 is internally threaded at 23 and screws upon threads at the upper end of cylinder 7.

Plunger 24 is fixed to tube 20, and is composed of two plates 25 and leather packing 26 between the said plates. This makes a particularly tight piston. Upper plate 25 is provided with a boss or bumper 27.

A valve consisting in part of cylinder 28, internally threaded near its top, so as to screw upon the lower end of tube 20, carries plunger 29, which is hollow or tubular except at the valve proper 30, which seats on valve-seat 31, formed in the shoulder 32 inside cylinder 28. A spring 33 surrounding plunger 29 normally keeps valve 30 seated on valve-seat 31, the said spring abutting against shoulder 32 and collar 34, held on plunger 29 by cotter 35 or some similar device.

When plunger 24 is being moved downward in cylinder 7, valve 30 remains tightly seated on seat 31; but on the upward stroke the air enters through port 36 and overcomes spring 33 and passes through openings 37 out past valve 30 into cylinder 7 and thence into cylinders 6 and 5 and through chamber 10 and out through exit-port 8.

The downstroke is compound, and consists, first, of the ordinary piston stroke of

plunger 24 by force applied to handle 14. About the time when the plunger 24 has reached the limit of its travel, lower nut 21 (practically speaking, handle 14) presses on cap 22, and continued application of force to handle 14 causes cylinder 7 to enter cylinder 6, which it telescopes, and further force causes cylinder 6 to telescope cylinder 5, with the result that the air in the three cylinders (amounting to much greater volume than if there were but one cylinder, as in ordinary pumps) is much compressed and forced under unusual pressure through chamber 10 and exit-port or passage 8. The three cylinders are plentifully supplied with air on the upstroke because of the freeness of the intake through port 36. The fact that the air in a plurality of cylinders is compressed by one plunger and the telescoping of all the cylinders into one cylinder (three volumes being thus required to occupy the space of only one) results in more forcible compression of the air and greater rapidity in inflating a tire or other object to be filled with air.

After use, the pump is collapsed, by causing the cylinders to telescope, and the wings 12 are folded against cylinder 5, thus reducing the whole to the minimum size, so that it will occupy the least possible space.

The top edge of cylinder 28 closely engages the lower surface of lower plate 25 of plunger 24.

There being a threaded connection between each collar 18 and only one of the adjacent cylinders, that part within each collar 18 next to the other adjacent cylinder being smooth, it follows that the cylinder against which the said smooth part bears is free to slide and, also, to turn.

The handle 14 may, also, be made collapsible or foldable, although this is not shown in the drawings.

Having thus described this invention, I hereby reserve the benefit of all changes in form, arrangement, order, or use of parts, as it is evident that many minor changes may be made therein without departing from the spirit of this invention or the scope of the following claims.

I claim:

1. A pump comprising a base, a plurality of cylinders suitably connected together and adapted to collapse the pump by assuming telescopic relation to each other, suitable inlet and outlet ports, a valve, and a plunger, the said connection between the said cylinders consisting in a grooved collar having packing within the said groove.

2. A pump comprising a base, a plurality of cylinders suitably connected together and adapted to collapse the pump by assuming telescopic relation to each other, suitable inlet and outlet ports, a valve, a plunger, and a plunger-rod, the said rod being hollow and the said inlet being through the said hollow plunger-rod, and the said valve being mounted on the inner end of the said plunger-rod.

3. A pump comprising a base, a plurality of cylinders suitably connected together and adapted to collapse the pump by assuming telescopic relation to each other, suitable inlet and outlet ports, a valve, a plunger, and a plunger-rod, the said rod being hollow and the said inlet being through the said hollow plunger-rod, and the said valve being mounted on the inner end of the said plunger-rod, the said valve having a hollow interior that communicates with the said hollow plunger-rod.

4. A pump comprising a base, a plurality of cylinders suitably connected together and adapted to collapse the pump by assuming telescopic relation to each other, suitable inlet and outlet ports, a valve, a plunger, a plunger-rod, the said rod being hollow and the said inlet being through the said hollow plunger-rod, and the said valve being mounted on the inner end of the said plunger-rod, the said valve having a hollow interior that communicates with the said hollow plunger-rod, and an exit from the said hollow interior.

5. A pump comprising a base, a plurality of cylinders suitably connected together and adapted to collapse the pump by assuming telescopic relation to each other, suitable inlet and outlet ports, a valve, a plunger, a plunger-rod, the said rod being hollow and the said inlet being through the said hollow plunger-rod, and the said valve being mounted on the inner end of the said plunger-rod, the said valve having a hollow interior that communicates with the said hollow plunger-rod, an exit from the said hollow interior, and a valve-proper adapted to close on the downstroke and open on the upstroke.

6. A pump including telescoping cylinders, a handle carrying a plunger rod mounted in one of the cylinders, a piston mounted on the rod, and a valve chamber detachably carried by said rod and pending below the piston, pressure on the handle of said plunger primarily operating the piston, continued pressure on the handle collapsing said cylinder to force the air therefrom, said handle being hollow to permit influx of air therethrough for opening the valve on the up-stroke of the piston.

In testimony whereof I hereunto affix my signature.

MELVIN B. ESLINGER.