

Nov. 18, 1924.

1,515,662

W. R. DE MORE

PUMP

Filed Jan. 18, 1924

2 Sheets-Sheet 1

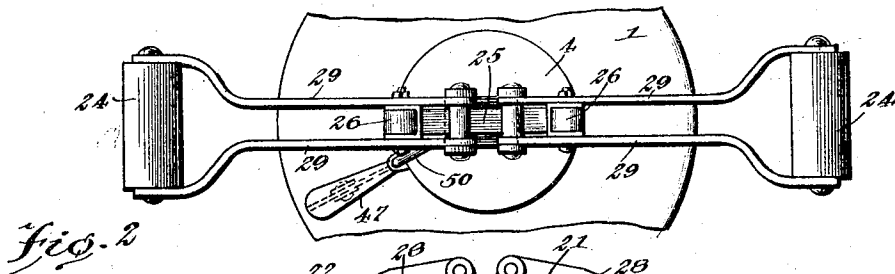


Fig. 2

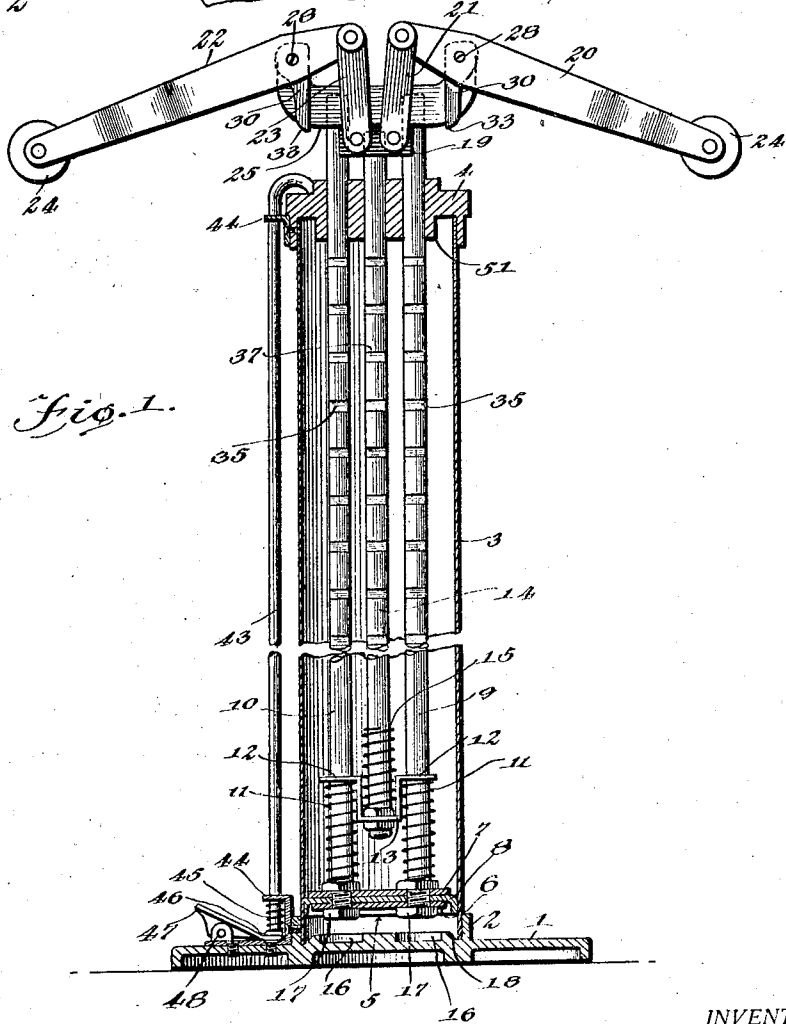


Fig. 1.

WITNESSES

Lawrence D. Mankin
Harry E. Seidel

INVENTOR

W. R. DeMore

BY

Mum & Co.

ATTORNEYS

Nov. 18, 1924.

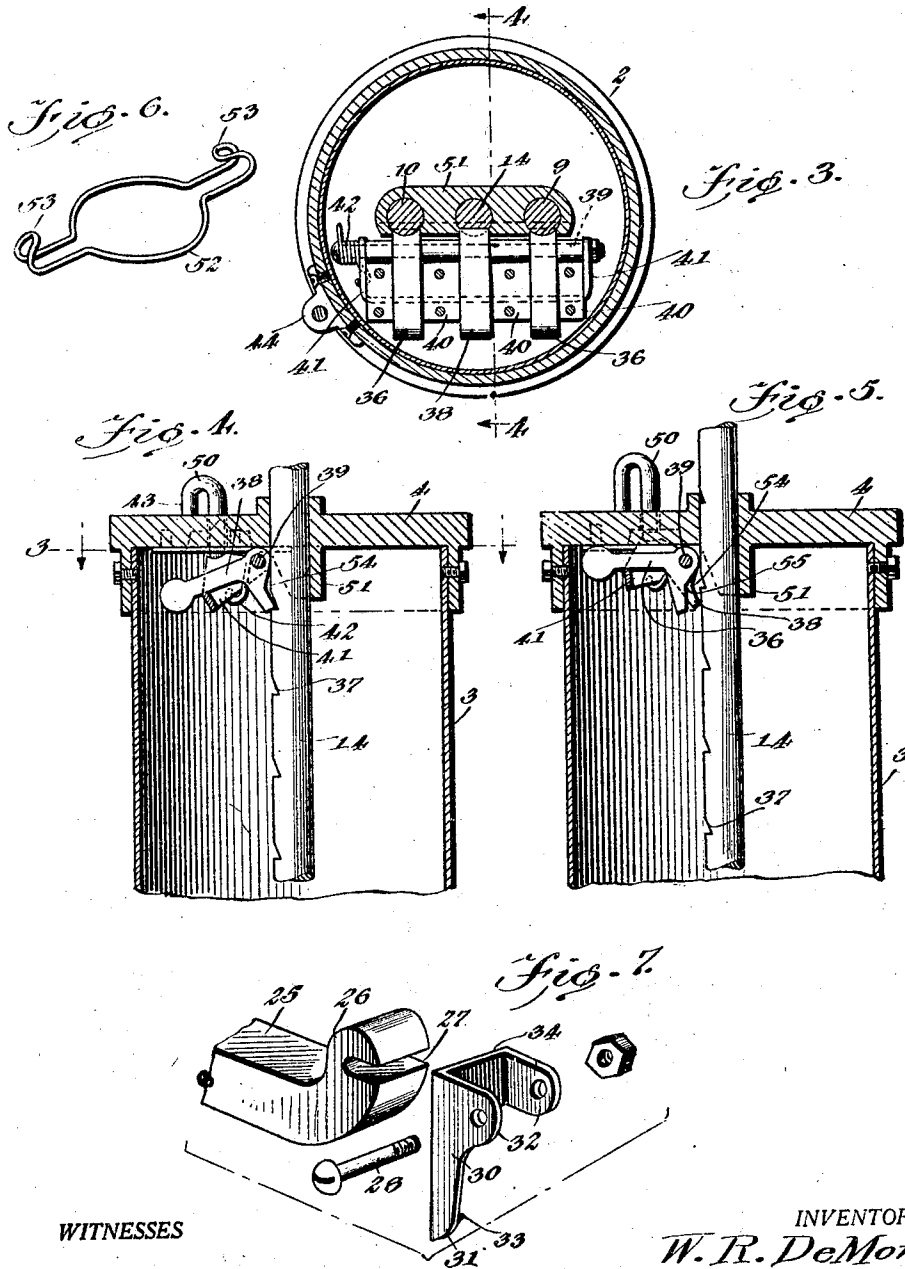
1,515,662

W. R. DE MORE

PUMP

Filed Jan. 18, 1924

2 Sheets-Sheet 2



WITNESSES

Laurence O. Muskin
Harvey C. Seidel

INVENTOR

W. R. DeMore,

BY *Mum Co.*

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM RICHARD DE MORE, OF JACKSONVILLE, FLORIDA.

PUMP.

Application filed January 18, 1924. Serial No. 687,071.

To all whom it may concern:

Be it known that I, WILLIAM RICHARD DE MORE, a citizen of the United States, and a resident of Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to pumps and is more particularly directed to a device for inflating tires.

An object of the invention is the provision of a pneumatic pump which has a direct stroke and complementary leverage stroke whereby a greater degree of pneumatic pressure may be had.

A further object of the invention is the provision of a pneumatic pump for inflating tires which will eliminate lost motion in the first part of the stroke of the pump, this portion of the stroke being a direct drive until the resistance becomes too great for ordinary strength and then a lever is operated to complete the stroke so that an ordinary person may compress three or four times the amount of air with approximately the effort required in the ordinary pumps.

A still further object of the invention is the provision of a pump which will supply air under pressure throughout the full movement of the plunger and whereby substantially no air will remain in the cylinder of the pump when the stroke has been completed.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming a part of the specification; nevertheless it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications which shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a vertical section of a pump constructed according to my invention.

Figure 2 is a fragmentary plan view of the same.

Figure 3 is a horizontal section taken along the line 3—3 of Figure 4.

Figure 4 is a vertical section taken along the line 4—4 of Figure 3.

Figure 5 is a vertical section similar to Figure 4, showing the pawl disengaged from the plunger rods.

Figure 6 is a view in perspective of a spring retaining means for the operating levers of the pump.

Figure 7 is a view in perspective of the loose pivotal connection for the operating levers with parts located in disengaged relation.

Referring more particularly to the drawings, 1 designates a base member having an upstanding annular flange 2 adapted to receive the lower end of a pump cylinder 3. The upper end of the cylinder is closed by a cap 4.

Mounted for reciprocation within the cylinder 3 is a plunger 5. The plunger comprises a pair of plates 6 and 7 having secured therebetween a flexible gasket 8 which is usual in pumps. The plates and gasket are locked in rigid relation by means of nuts located upon opposite sides of the plates 6 and 7 and having threaded engagement with the lower ends of the rods 9 and 10. The rods are movable through perforations in the cap 4.

Coil springs 11 surrounding the lower ends of the rods 9 and 10 have their lower ends in engagement with the securing nuts upon the inner plate 7 and their upper ends engaged by the perforated lateral extensions 12 of the U-shaped bracket 13. The rods 9 and 10 pass through the perforations in the lateral extensions 12, with the extensions being slidable on said rods.

A centrally disposed rod 14 passes through a central perforation in the cap 4 and projects beyond the cap and has its one end locked by means of nuts to the bridging portion of the U-shaped member 13. A coil spring 15 surrounds the lower end of rod 14, and is secured to the rod at its upper end and has its lower end abutting the U-shaped member 13.

The inner wall of the base 1 is provided with sockets 16 adapted to receive the nuts 17 on the rods 9 and 10 and the base member is likewise provided with an annular groove 18 to receive the depending flange of the

gasket 8 so that when the piston 5 is placed in its lowermost position the nuts 17 will fit in the pockets 16 and the depending flange on the gasket 8 will fit into the annular groove 18 and thereby permit the plunger to contact with the inner wall of the base member 1.

A sliding cross head 19 is rigidly connected with the upper end of the rod 14 and is provided with arcuately shaped end grooves engageable with the rods 9 and 10 whereby the cross head will be adapted to slide between the rods 9 and 10 and be guided thereby. A lever 20 is pivotally connected by means of the link 21 to the cross head 19 while a lever 22 is pivotally connected by means of a link 23 to the cross head. The levers are provided with hand grips 24 at their outer ends whereby the same may be operated. A block 25 is rigidly connected to the upper ends of the rods 9 and 10 and has its ends upturned as shown at 26 and provided with slots 27 adapted to receive a bolt 28 mounted in the perforations in the bars 29 which cooperate to support the levers 20 and 22. The engagement of the bolts 28 in the slots 27 provides a fulcrum for the operation of the levers.

In order to prevent the bolts 28 from being displaced from the slots 27 when the handles or levers 20 and 22 are operated I provide a locking member 30 having a depending arm 31 and perforated ears 32 which receive the bolt 28. The depending arm 31 is provided with a lug 33 which is adapted to engage beneath the outer projecting ends of the block 25, as shown in Figure 1. The flat portions 34 of the members 30 are adapted to engage at the rear of the upstanding portions 26 at the ends of the block 25 and prevent outward movement of the locking member 30. When it is desired to release the handles or levers 20 and 22 from the fulcruming slots 27, the arms 31, due to their resilience, are forced laterally outward to remove the lugs 33 from beneath the block 25 whereby the lower ends of said arms may be oscillated inwardly and cause the flat portions 34 to be swung to a position above the tops of the upstanding portions 26. By exerting a lateral pull on the levers 20 and 22 the bolts 28 are disengaged from the slots 27.

The rods 9 and 10 are provided with a plurality of spaced notches 35 adapted to be engaged by pawls 36 in order to lock the rods against upward movement at certain times during the upward movement of the levers 20 and 22.

The rod 14 is provided with notches 37 adapted to be engaged by a pawl 38 for preventing upward movement at certain times of said rod. These three pawls are pivotally mounted on a rod 39 which is mounted

in bearings formed on the ends of plates 40 secured to the inner face of cap 4. A U-shaped bracket 41 supports the outer ends of the pawls and is forced upwardly by means of a spring 42 whereby the pawls are maintained out of engagement with the notches in the rods 9, 10 and 14. The U-shaped bracket 41 is pivotally mounted on the rod 39.

An actuating rod 43 is mounted for sliding movement in brackets 44. A spring 45 between the lower bracket 44 and a nut or enlargement 46 on the end of the rod 43 is adapted to maintain the rod depressed or in its lowermost position. A lever 47 pivotally mounted at 48 has its inner end located beneath the nut 46 on the rod 43 so that when the outer end of lever 47 is depressed the rod will be elevated. The upper end of the rod is provided with a U-shaped member, with the end 50 passing through a perforation in the cap 4 and adapted to engage one end of the bracket 41 and force said bracket downwardly against the tension of the spring 42 and permit the pawls to fall into engagement with their respective notches in the rods 9, 10 and 14 and prevent upward movement of the rods when the levers 20 and 22 are elevated. An elongated boss 51 depending from the inner face of cap 4 is provided with passages in which the rods 9, 10 and 14 are slidable, the boss forming a bearing for the upper ends of the rods.

When the arms 20 and 22 have been moved laterally outward causing the bolts 28 to become disengaged from the slots 27, the arms may be positioned longitudinally of the cylinder 3 and locked against displacement by a spring member 52.

The spring member is provided with hooks 53 at its outer end which engage the hand grips 24 and maintain the grips adjacent the outer wall of the cylinder 3. The substantially annular central portion of the spring member 52 embraces the cylinder 3.

It will be noted from Figures 4 and 5 that the portion 54 of pawl 38 is shaped slightly different from the portion 55 of the pawls 36 so that the pawl 38 will engage its respective notches in the rod 14 more readily than the pawls 36 will engage their respective notches in the rods 9 and 10.

The operation of my device is as follows:

In the normal operation of the pump the outer end of the lever 47 is depressed thereby elevating the rod 43 and causing the member 50 on the upper end of the rod to be raised from the U-shaped bracket 41 thereby permitting the spring 42 to elevate said bracket and likewise the three pawls out of engagement with the notches of the three rods 9, 10 and 14. By pulling upon the handles 24, the plunger together with the three rods, are simultaneously elevated.

Pressing upon the handles 24 downwardly will cause a simultaneous lowering of the three rods and the piston 5. The down stroke is continued until the downward movement is sufficient to become laborious to the operator of the pump. At this time the lever 47 is released permitting the rod 43 to descend and thereby causing member 50 to be moved downwardly and lower the bracket 41 against the tension of spring 42 so that the pawls will engaged the notches in their respective rods. An upward pull is exerted on the handles 24 when the pawls 36 engaging the notches 35 will prevent upward movement of the rods 9 and 10, and since the levers 20 and 22 are rocked on their pivots 28 the cross head 19 will be depressed through the links 21 and 23. This causes the lower end of rod 14 to be depressed, carrying U-shaped member 13, and the lateral extensions 12 downwardly, and compressing springs 11.

As soon as the cross head has moved down to its normal position by the upward pull of the handles 24, the handles are depressed forcing rods 9 and 10 downwardly while rod 14 is maintained stationary since it is engaged by pawl 38. When rods 9 and 10 are lowered piston 5 is also lowered thus completing the stroke of the pump, and since piston 5 is adapted to contact with the inner surface of the base of the pump all the air is forced out of cylinder 3.

The release of lever 47 raises the pawls from their respective notches so that the piston 5 and rods 9, 10 and 14 may be elevated freely.

Rods 9 and 10 are devoid of notches at points where the acting ends of the pawls are in engagement with said rods when the rods are at the end of their stroke. The upper notch on each rod 9 and 10 being located below the pawls when the rods are fully depressed.

Ratchet 38 by reason of the difference in its construction over that of ratchets 36 will become disengaged while ratchets 36 are still engaged.

What I claim is:

1. A pump comprising a cylinder, a piston, a plurality of rods connected with the piston, a plurality of levers forming handles for direct reciprocation of the piston for a portion of the stroke of said piston, fulcrums for the levers, and means causing one of the rods to remain stationary when the levers are rocked on the fulcrums and for permitting reciprocation of the other rods to complete the stroke of the piston.

2. A pump comprising a piston, a plurality of rods connected with the piston, a plurality of levers forming operating handles for direct reciprocation of the piston for a portion of the stroke of the piston, means connecting a pair of the rods rigidly to-

gether and provided with fulcrums forming a pivotal support for the operating levers, means connecting the levers with the other rod, and means for maintaining the last mentioned rod against movement whereby the levers are rocked on their pivot points for completing the stroke of the piston through the pairs of rigidly connected rods.

3. A pump comprising a piston, a plurality of rods connected with the piston, a plurality of levers forming operating handles for direct reciprocation of the piston for a portion of the stroke of the piston, means connecting a pair of the rods rigidly together and provided with fulcrums forming a pivotal support for the operating levers, resilient means connecting the pair of rods with the other rod, and means for maintaining the last mentioned rod against movement whereby the levers are rocked on their pivot points for completing the stroke of the piston through the pairs of rigidly connecting rods, said resilient means permitting movement of the last mentioned rod independent of the pairs of rods whereby the levers are set for further rocking movement.

4. A pump comprising a piston, a plurality of rods connected with the piston, a plurality of levers forming operating handles for direct reciprocation of the piston for a portion of the stroke of the piston, means connecting a pair of the rods rigidly together and provided with fulcrums forming a pivotal support for the operating levers, resilient means connecting the pair of rods with the other rod, and means for maintaining the last mentioned rod against movement whereby the levers are rocked on their pivot points for completing the stroke of the piston through the pairs of rigidly connected rods, said resilient means permitting movement of the last mentioned rod independent of the pairs of rods whereby the levers are set for further rocking movement, and means for retaining the pair of rigidly connected rods against movement during certain strokes of the levers.

5. A pump comprising a piston, a plurality of rods connected with the piston, a plurality of levers forming operating handles of direct reciprocation of the piston for a portion of the strokes of the piston, means connecting a pair of the rods rigidly together and provided with fulcrums forming a pivotal support for the operating levers, resilient means connecting the pair of rods with the other rod, and means for maintaining the last mentioned rod against movement whereby the levers are rocked on their pivot points for completing the stroke of the piston through the pairs of rigidly connected rods, said resilient means permitting movement of the last mentioned rod independent of the pairs of rods whereby the levers are set for further rocking movement,

means for retaining the pair of rigidly connected rods against upward movement, the retaining means for the other rod permitting downward movement of said rod when the levers are rocked in one direction.

6. A pump comprising a piston, a plurality of rods connected with the piston, a plurality of levers forming operating handles for direct reciprocation of the piston for a portion of the stroke of the piston, means connecting a pair of the rods rigidly together and provided with fulcrums forming a pivotal support for the operating levers, resilient means connecting the pair of rods with the other rod, and means for maintaining the last mentioned rod against movement whereby the levers are rocked on their pivot points for completing the stroke of the piston through the pairs of rigidly connected rods, said resilient means permitting movement of the last mentioned rod independent of the pairs of rods whereby the levers are set for further rocking movement, means for retaining the pair of rigidly connected rods against upward movement, the retaining means for the other rod permitting downward movement of said rod when the levers are rocked in one direction, and means for manually releasing the retaining means from operative relation with the rods.

7. A pump comprising a cylinder, a piston, a plurality of rods connected with the piston, a plurality of levers forming handles for direct reciprocation of the piston for a portion of the stroke of said piston, fulcrums for the levers, and means causing one of the rods to remain stationary when the levers are rocked on the fulcrums and permitting reciprocation of the other rods to complete the stroke of the piston, a bracket slidably mounted on the rods and resilient means on the rods for connecting the rods together and permitting relative movement between certain of the rods.

8. A pump comprising a cylinder, a piston, a movable block, a rod operating in the cylinder connected at one end to the block and connected at its other end to the piston, a cross head, means connecting the cross head with the piston, levers pivotally mounted on the cross head, and links connecting the block with the levers.

9. A pump comprising a cylinder, a piston, a movable block, a rod operating in the cylinder connected at one end to the block and connected at its other end to the piston, a cross head, means connecting the cross head with the piston, levers pivotally mounted on the cross head, and links connecting

the block with the levers, means engageable with the rod for maintaining the rod against movement in one direction, means engageable with the connecting means between the piston and the cross head for maintaining said means against movement in one direction.

10. A pump comprising a cylinder, a piston, a movable block, a rod operating in the cylinder connected at one end to the block and connected at its other end to the piston, a cross head, means connecting the cross head with the piston, levers pivotally mounted on the cross head, and links connecting the block with the levers, means engageable with the rod for maintaining the rod against movement in one direction, means engageable with the connecting means between the piston and the cross head for maintaining said means against movement in one direction, and means adapted to hold the maintaining means against operation.

11. A pump comprising a cylinder, a piston, a plurality of rods connected with the piston, said rods being provided with notches, spring pressed pawls adapted to engage the notches, a cross head rigidly connected with certain of the rods, levers pivotally mounted on the cross head, a block rigidly connected with the other rod, links connecting the levers to the block, said pawls being adapted to lock the pair of rods against reciprocation and permit reciprocation of the other rod when the levers are operated, one of the pawls adapted to engage the other rod and maintain it against reciprocation while permitting the levers to oscillate the pair of rods.

12. A pump comprising a cylinder, a piston, a plurality of rods connected with the piston, said rods being provided with notches, spring pressed pawls adapted to engage the notches, a cross head rigidly connected with certain of the rods, levers pivotally mounted on the cross head, a block rigidly connected with the other rod, links connecting the levers to the block, said pawls being adapted to lock the pair of rods against reciprocation and permit reciprocation of the other rod when the levers are operated, one of the pawls adapted to engage the other rod and maintain it against reciprocation while permitting the levers to oscillate the pair of rods, and manual means adapted to hold the pawls in an inactive position whereby all the rods are simultaneously reciprocated by the levers.

WILLIAM RICHARD DE MORE.