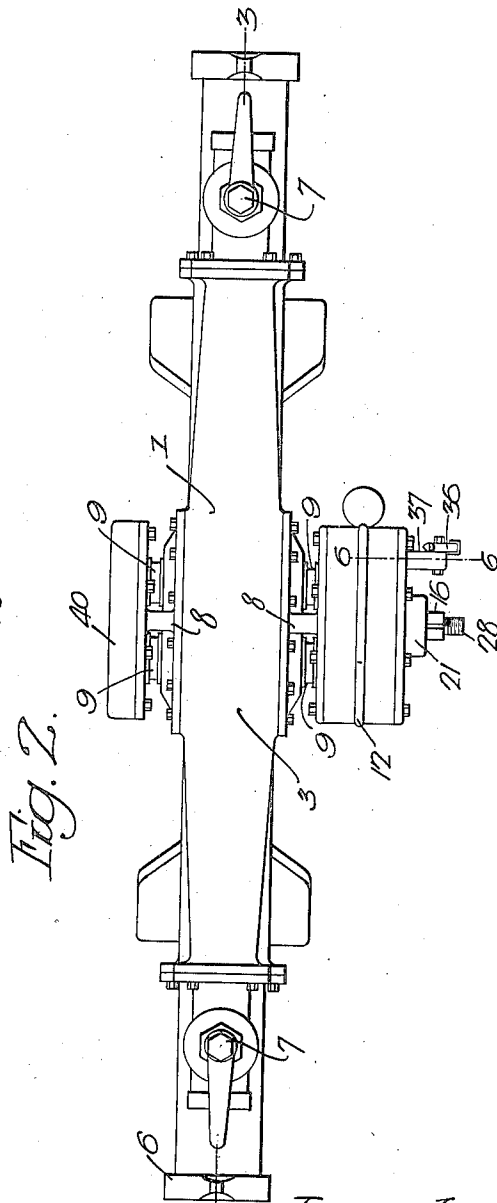
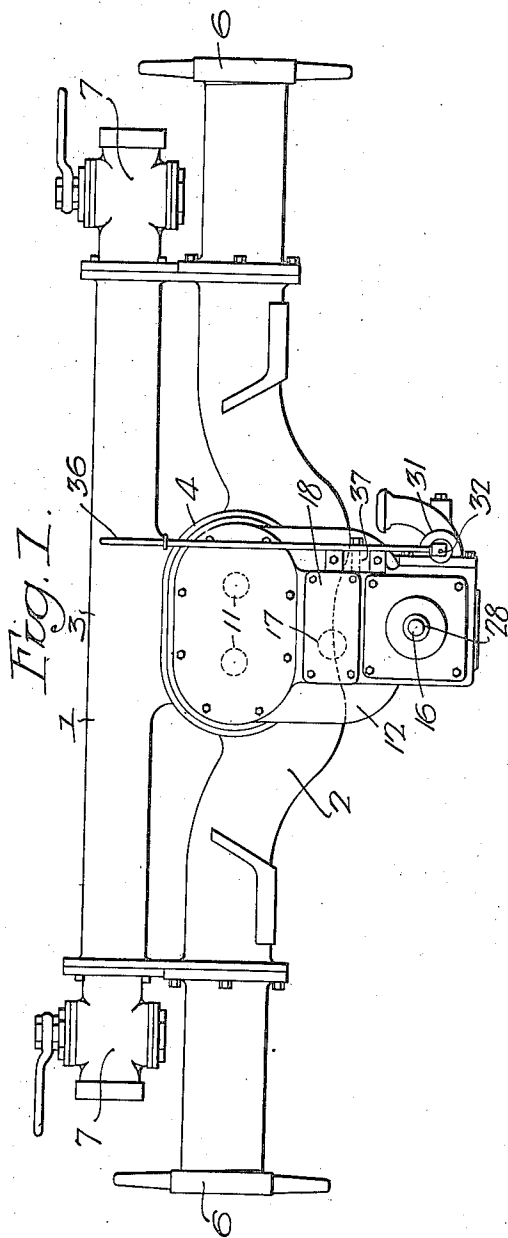


Feb. 20, 1923.

C. H. YOUNG, JR.
PUMP OR MOTOR.
FILED FEB. 18, 1922.

1,446,366.

4 SHEETS—SHEET 1.



Inventor.
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Johnson & Johnson.

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4 SHEETS—SHEET 2.

Fig. 3.

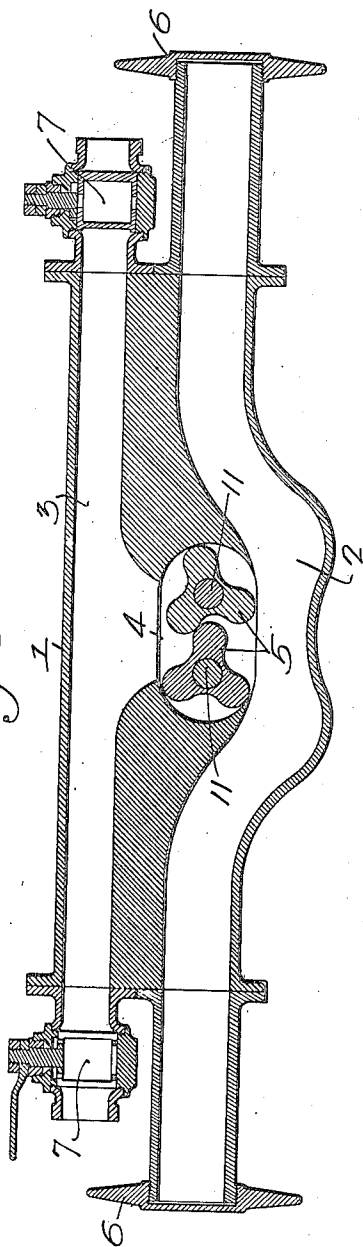
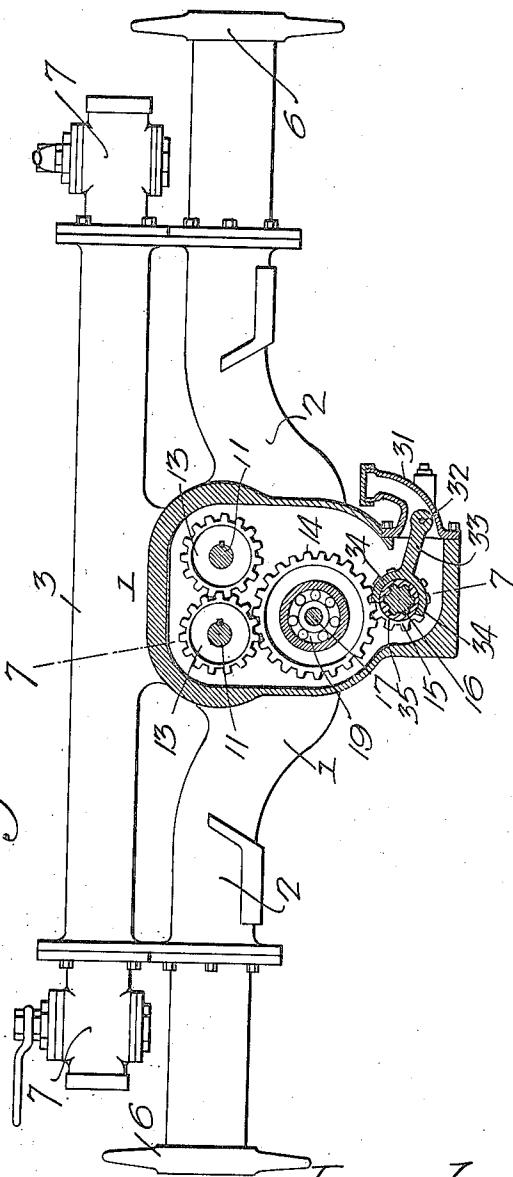


Fig. 4.



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4 SHEETS—SHEET 3.

Fig. 5.

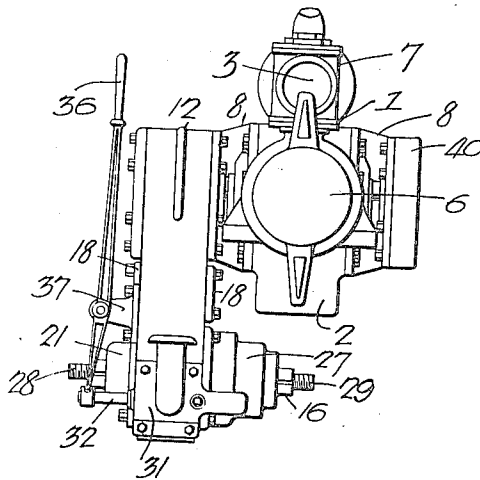
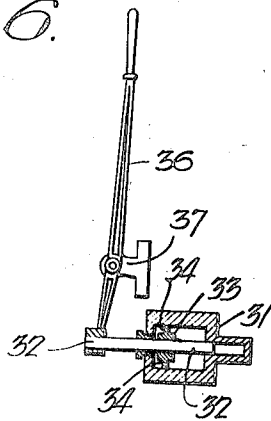


Fig. 6.



Inventor.—
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Howson & Howson

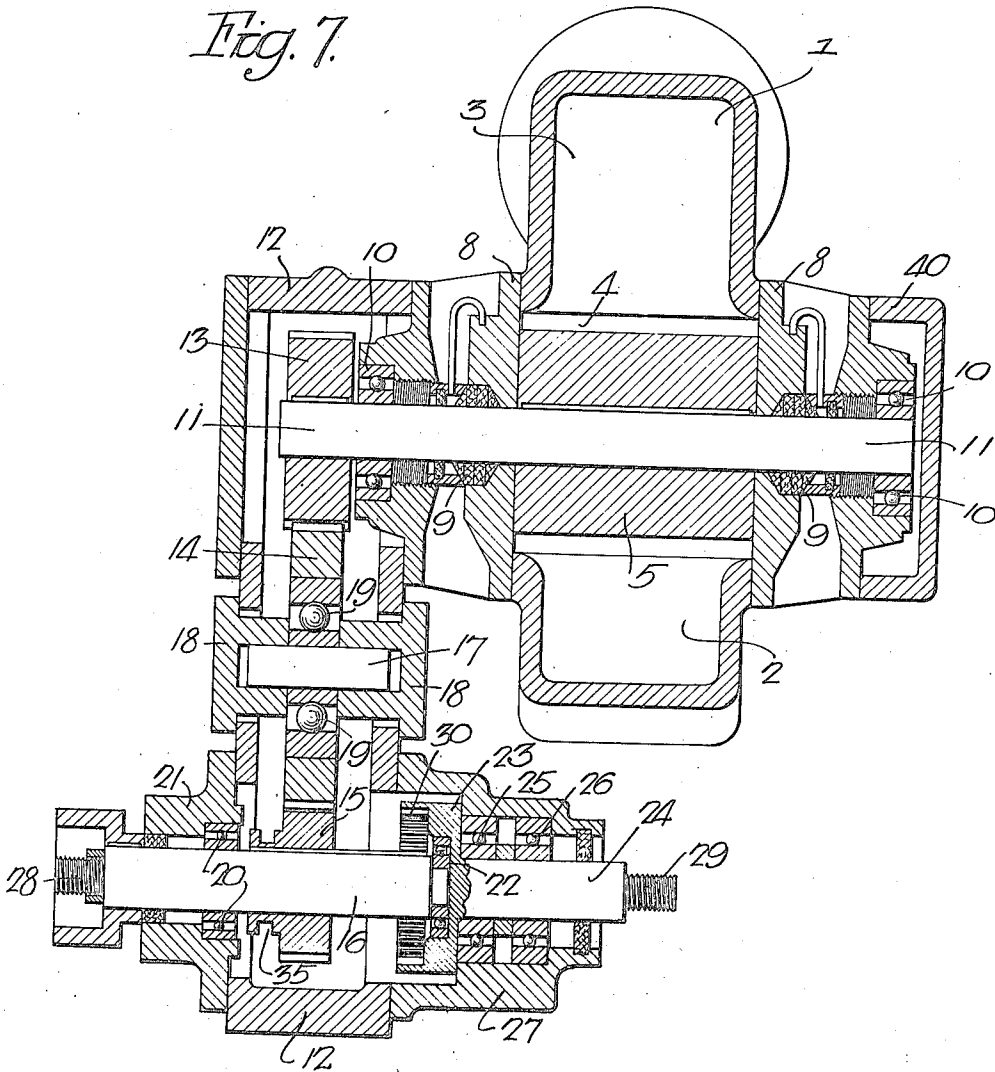
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4 SHEETS—SHEET 4.

Fig. 7.



Inventor—
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Patented Feb. 20, 1923.

1,446,366

UNITED STATES PATENT OFFICE.

CHARLES H. YOUNG, JR., OF WAYNE, PENNSYLVANIA, ASSIGNOR TO HALE FIRE PUMP CO., INC., OF CONSHOHOCKEN, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PUMP OR MOTOR.

Application filed February 18, 1922. Serial No. 537,433.

To all whom it may concern:

Be it known that I, CHARLES H. YOUNG, Jr., a citizen of the United States, residing in Wayne, Delaware County, Pennsylvania, have invented certain Improvements in Pumps or Motors, of which the following is a specification.

My invention relates to improvements in pumps or motors, and more particularly in that type of pump employed in motor fire engines.

The main object of my invention is to provide a pump having certain features of reversibility rendering it adaptable without alteration to a large variety of standard commercial truck chassis.

In the attached drawings:

Figure 1, is a front elevation of a pump made in accordance with my invention;

Fig. 2, is a plan view of the pump;

Fig. 3, is a horizontal section on the line 3-3, Fig. 2;

Fig. 4, is a front elevation similar to that of Fig. 1, but having the front plates of the gear casing removed;

Fig. 5, is an end elevation of the pump;

Fig. 6, is a fragmentary section on the line 6-6, Fig. 2, illustrating the details of the gear shift mechanism, and

Fig. 7, is an enlarged section on the line 7-7, Fig. 4.

With reference to the drawings, the pump comprises a main casing 1 adapted to be mounted laterally of a motor vehicle and including intake and discharge ducts 2 and 3 respectively, and a pump chamber 4 in which are mounted in the present instance a pair of rotors 5, 5.

As best shown in Fig. 3, the discharge duct 3 vertically overlies the intake 2, the pump chamber 4 with which the ducts communicate lying intermediate the two ducts and at their centers, the ducts extending from the pump chamber laterally to each side in such manner that their ends may lie at the opposite sides of the vehicle upon which the pump is mounted. The ends of the intake duct 2 are provided with caps 6, 6, which are screwed to the ends of the duct, while the ends of the discharge duct 3 are controlled by valves 7, 7.

To each side of the casing 1 and adapted to close the sides of the pump chamber 4 are pump heads 8, 8, said heads being identical and interchangeable, and each is pro-

vided with a pair of stuffing-boxes 9, 9, and bearings 10, 10, for the rotor shafts 11, 11, which are mounted in said heads. Adapted to be secured to the outer flanged face of one or other of the pump heads 8 is a drive unit casing comprising a body casing 12, which is symmetrically formed around its longitudinal center line and which is adapted to house a pair of intermeshing pinions 13, 13, on the projecting ends of the shafts 11, 11, a gear wheel 14 which meshes with one of the said gears 13, and a pinion 15 upon a shaft 16, which latter is mounted at the lower end of the said body casing.

The gear 14, as best shown in Fig. 7, is carried by a short shaft 17, bearings for which are formed upon the inside of face plates 18, 18, secured to the opposite sides of the casing 12, said bearings, as indicated in Fig. 1, being disposed laterally of the vertical center line of the plate in order that the gear may mesh with one of the pinions 13, while clearing the other. It will also be noted at this point that the plates 18, 18, are identical and therefore interchangeable, and are also symmetrically formed around their axes so as to render them reversible. It will be apparent that by reversing the plates, the bearings 18 will be thrown to the opposite side of the vertical center line whereby the gear 14 will be brought into mesh with the other of the pinions 13, this having the effect of reversing the rotation of the rotors. The gear 14 is, in the present instance, equipped with ball bearings 19.

As best shown in Fig. 7, one end of the shaft 16 is mounted in a bearing 20 within a cover 21 secured to one side of the casing 12, while the opposite end which is of reduced diameter extends into a recess 22 within the enlarged inner end portion 23 of a shaft 24, which latter is mounted in a pair of bearings 25 and 26 in a cover casing 27, which latter is secured to that side of the casing 12 opposite the cover 21. Threaded extensions 28 and 29 extend from the exposed ends of the shafts 16 and 24 and provide means whereby these shafts may be secured in the drive shaft of the motor of the vehicle, the shaft 16 being always nearer the engine than the shaft 24, which latter is suitably connected with the drive wheels of the vehicle.

As previously stated, the pinion 15 is

splined to and therefore slidable upon the shaft 16, and there is formed in the interior of the enlarged portion 23 of the shaft 24 an annular gear 30 with which the pinion 15 is adapted to mesh, said pinion and annular gear 30 thereby constituting a clutch for uniting the shafts 16 and 24. Means is provided for shifting the pinion 15 from the position in which it is shown in Fig. 7 in which it meshes with the gear 14, to a position in which it meshes with the annular gear 30, and the reverse, said shifting means consisting in the present instance of a gear shift box 31 secured as shown in Fig. 5 to one side of the casing 12, in which box is mounted upon a shaft 32 which extends through one side of the box 31, a forked shifting element 33 having arms 34, 34, extending into opposite sides of an annular recess 35 in the pinion 15, the shaft 32 being reciprocated in the box 31 by means, in the present instance, of a lever 36 pivotally mounted on a bracket 37 secured to the front of the casing 12, the lower end of said lever being suitably connected with the exposed end of the said shaft 32, as best shown in Fig. 6.

It should be here stated that the cover flange 21 and the casing 27 are so designed as to be interchangeable whereby the relative positions of the shafts 16 and 24 may be reversed.

As previously described, the casing 12 is adapted to be secured to one or other of the heads 8, as may be found desirable, and where the casing 12 is secured to one of the said heads, a cap casing 40 is provided for attachment to the other of the heads in place of the casing. In this manner, it will be clear that the casing 12 may be positioned at either side of the pump body 1, and it will further be noted that the casing 12 is so formed as to be itself reversible on the head to which it may be attached.

It will be apparent from the foregoing that the casing 12 and its various connected elements which go to constitute the drive unit of the pump may be so reversed and interchanged and positioned with respect to the body 1 of the pump as to render the pump with its drive unit adaptable for mounting upon many of the standard makes of motor vehicle, and that with this arrangement the most favorable positioning of the pump in the vehicle may be attained. It will also be apparent that with a pump constructed in this fashion, the parts may be standardized with the reasonable assurance that the pump in its standard form can be adapted to nearly any chassis upon which it may be desired to mount it.

I claim:

1. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, of a rotor

mounted in said chamber, power transmitting elements adapted for operative connection with the rotor, and a casing for said elements adapted to be secured to said main casing in a plurality of different positions.

2. The combination with a main casing comprising a plurality of ducts and an open ended chamber with which said ducts communicate, heads adapted to be secured to said casing to close the open ends of said chamber, a shaft mounted in said heads and extending through the chamber, a rotor mounted on the shaft, power transmitting elements adapted for operative connection with the shaft, and a casing for said elements adapted to be secured to said heads and interchangeable from one to the other.

3. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, of a rotor in said chamber, power transmitting elements adapted for operative connection at either side of said rotor, and a casing for said elements adapted to be secured to either side of said casing.

4. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, of a rotor in said chamber, power transmitting elements adapted for operative connection with the rotor, and a casing for said elements adapted to be secured to the said main casing at either side thereof and to be reversed in either position.

5. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, of a rotor in said chamber, power transmitting elements, including a shaft, adapted for operative connection with the rotor, a casing for said elements, and means for securing said casing to the main casing in a plurality of different positions whereby the said shaft may be made to assume reverse positions.

6. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, a pair of shafts mounted in said casing and extending through the chamber, a pinion on each of said shafts, a casing adapted to be secured to said main casing, power transmitting elements mounted in said casing and including a gear adapted to mesh with one or other of the pinions on said shafts, a shaft for said gear, bearings for said shaft detachably secured to the casing, and means for changing the position of said bearings in the casing to bring the said gear into mesh with either one or other of said pinions.

7. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, of a rotor in said chamber, a casing adapted to be secured to said main casing, power transmitting elements mounted in said casing and

adapted for operative connection with the rotor, said power transmitting elements including a shaft, bearings for said shaft detachably secured to said casing, and means
5 for interchanging the positions of said bearings whereby the position of the shaft in the casing may be reversed.

8. The combination with a main casing comprising a chamber and a plurality of
10 ducts communicating therewith, of a rotor in said chamber, a casing adapted to be secured to said main casing, power transmitting elements adapted for operative connection with the rotor mounted in said latter
15 casing and including a pair of aligned shafts, means for operatively connecting one of said shafts with the rotor, means for connecting one of said shafts to the other, and means for reversing the position of said
20 shafts in the casing.

9. The combination with a main casing comprising a chamber and a plurality of ducts communicating therewith, of a rotor in said chamber, a casing adapted to be se-

cured to either side of the main casing, 25 power transmitting elements adapted for operative connection with the rotor mounted in said latter casing and comprising a pair of aligned shafts, means for connecting one of said shafts with the rotor, means for con- 30 necting one shaft with the other, and means for reversing the position of said shafts in the casing.

10. The combination with a main casing comprising a chamber and a plurality of
35 ducts communicating therewith, of a rotor in said chamber, a casing adapted for attachment to either side of said main casing and to be reversed in either position, power transmitting elements adapted for operative
40 connection with the rotor established in said casing and including a pair of aligned shafts, means for connecting one of said shafts with the rotor and with the other of said shafts, and means for reversing the
45 position of said shafts in the casing.

CHARLES H. YOUNG, JR.