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J. C. WEAVER ET AL.

GEAR CHANGING MECHANISM

Filed June 11, 1926

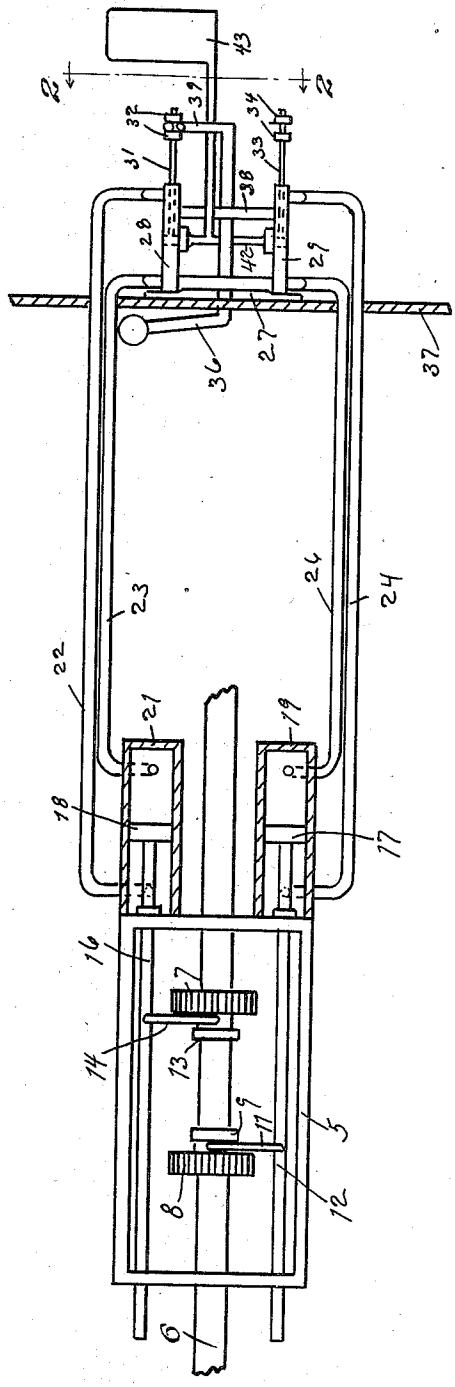
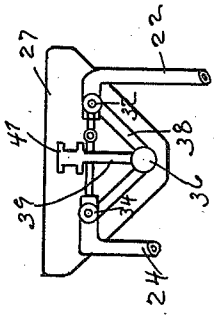


Fig. I.

Fig. II.



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UNITED STATES PATENT OFFICE.

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GEAR-CHANGING MECHANISM.

Application filed June 11, 1926. Serial No. 115,279½.

This invention relates to gear changing mechanism and has particular reference to means for shifting the gears of an automobile transmission.

The principal object of this invention is to provide hydraulic means for shifting the gears.

Another object of this invention is to eliminate the customary gear shifting lever commonly found in the driver's compartment of automobiles.

A still further object of this invention is to produce a device of this character which is positive in its operation and one which is simple, and, therefore, not easily deranged.

An additional object is to provide means whereby the hydraulic line will be automatically maintained full of fluid at all times.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure I is a top plan view of our improved gear shifting mechanism partly broken away in order to better illustrate the invention, and

Figure II is a cross section taken on the line 2—2 of Figure I.

It is a well-known fact that the shifting arrangement of an automobile is inconveniently arranged in the driver's compartment the result being that when a person desires to move from one side of the car to the other, the shifting lever is often in the way, necessitating the person getting out of the car, going around to the opposite side and then re-entering.

We have eliminated this difficulty by removing the control lever to a point near the dash-board, where it is convenient to operate and at the same time does not interfere with the movement of the occupant of the vehicle.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of our invention, the numeral 5 designates the customary gear shift housing, while the numeral 6 designates the customary drive shaft upon which the shift gears 7 and 8 are mounted.

The gear 8 is provided with a collar 9 which is engaged by a yoke 11, which yoke is carried upon a slider 12, while a gear 7 has a collar 13 which is engaged by the yoke 14 carried upon the slider 16. The sliders 12 and 16 are each slidably mounted in the gear casing 5 and extend to a point outside of the casing.

The slider 12 has a piston 17 secured thereto, while the slider 16 has a piston 18 secured thereto. These pistons are adapted to move in cylinders 19 and 21, respectively. The cylinder 21 has connected thereto pipes 22 and 23, which pipes are connected to the opposite end of the cylinder, while the cylinder 19 has pipes 24 and 26 secured thereto in a similar manner.

These pipes 22, 23, 24 and 26 are conducted beneath the floor of the car to a point in advance of the dash and then are led upwardly as is best shown in Figure II.

Mounted upon the dash is a plate 27 to which is secured control cylinders 28 and 29. The cylinder 28 has connected thereto, at opposite ends thereof, the pipes 22 and 23, while the cylinder 29 has connected thereto, at its opposite ends, pipes 24 and 26. Movable within the cylinders 28 is a piston to which is connected a push rod 31, which push rod has on the ends thereof spaced collars 32, while within the cylinder 29 is a piston having a push rod 33 which carries at its free end spaced collars 34.

At 36 we have shown a control lever which extends through the dash 37 and is journalled in a cross brace 38. The end of this lever is formed at right angles to its major portion so as to form an arm 39 upon which is provided a pair of oppositely disposed forks 41.

The result of this construction is that when the lever 36 is moved either to the right or to the left, one of the forks will move into contact with one of the pusher rods, at a point between the collars carried thereon, after which that particular pusher rod will be manipulated so as to move the piston connected thereto.

At 42 we have shown an equalizing pipe which communicates with the cylinders 28 and 29, the point of communication being greater than the width of the piston in the cylinder, the result being that when the piston is in its neutral position, fluid from

the tank 43 will flow to both sides of the piston thereby keeping the reservoir full at all times, and allowing for the expansion and contraction of the liquid.

The manner of operating our device is as follows:—

Assuming that the car is at a standstill the lever 36 will be in a vertical position. If it is now desired to move into low gear, the lever 36 will be moved toward the left so that the forks 41 will engage the pusher rod 31 at a point between the collars 32. By now drawing outwardly upon the lever 36 the piston within the cylinder 28 will be moved toward the right of the drawing. This will force fluid through the pipe 23 into the cylinder 21, pushing the piston within the cylinder 18 rearwardly, which will move the slider 16 and, consequently, moving the gear 7 into low gear position.

When it is desired to change from low to intermediate, the handle 36 is again grasped, shoved in, which will cause the fluid on the opposite side of the piston 28 to pass through the pipe 22 and to the opposite side of the piston 18 which will act to move the gear 7 out of its low gear position.

By now swinging the lever 36 toward the right of the drawing, the pusher rod 33 will be engaged, after which the next gear shift may be executed.

It will thus be seen that it is possible with our mechanism to shift the gears in the manner above described and with this apparatus all of the objects above set forth may be easily accomplished.

It is to be understood that the form of our invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described our invention, we claim:—

In a gear shifting mechanism, the combination with a gear shifting mechanism, having a pair of sliding gears therein, a pair of sliders positioned therein, a collar formed on each of said gears, an arm formed on each of said sliders and adapted to engage the respective collar of each gear, a piston formed on each of said sliders, a cylinder surrounding each of said pistons, a pipe communicating with the interior of each of said cylinders, at a point adjacent one end thereof, a pipe communicating with each of said cylinders at a point adjacent the opposite end thereof, means for independently forcing a fluid through any one of said pipes, said means comprising a pair of control cylinders having pistons slidably positioned therein, one of said control cylinders communicating with said pipes connected to one of said first mentioned cylinders, the other of said control cylinders communicating with said pipes connected to the other of said first mentioned cylinders, and means for reciprocating said pistons in said control cylinders.

In testimony whereof we affix our signatures.

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