



# UNITED STATES PATENT OFFICE.

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## ROD-SHIFTING DEVICE.

1,298,226.

Specification of Letters Patent.

Patented Mar. 25, 1919.

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To all whom it may concern:

Be it known that I, RAYMOND F. LANDIS, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Rod-Shifting Devices, of which the following is a specification.

This invention relates to improvements in valve actuated shifting devices and it is intended more particularly for the shifting of rods to which are attached the movable members of a train of gears, whereby different speeds or directions of movement may readily be obtained.

It is particularly applicable to shifting the gears of a motor driven vehicle in which vacuum, air pressure or other suitable fluid is used to produce the shifting, through a pair of cylinders having pistons and rods to which the movable members of the train of gears are attached or connected.

The invention is more fully described in the following specification and clearly illustrated in the accompanying drawing, in which:—

Figure 1 is a vertical sectional view of my device.

Fig. 2 is a plan view of the operating valve casing.

In the drawing, C and C' represent a pair of cylinders, in each of which is located a piston 20, backed by springs 21. These pistons are provided with piston rods R and R' respectively, which rods are formed with valves T and V respectively through which communication may be established from the source of supply, indicated by the letter S, while H' and H'' represent tubular communications leading from these valves T and V to the manually operated controlling valves 6.

The numeral 1 designates a casing inclosing a body or block 4, provided with a plurality of vertical valve openings 5 in each of which is located a vertically movable valve 6 and these valves are provided with manually operable buttons 7, 7', 7'', and 7''', at their upper ends. These valves are also provided with a means for holding them in depressed or open position and for releasing them from such position, indicated by a slide 13 provided with perforations 14 adapted for engaging depressions 8 in the valves. Each of the valve bodies is formed with a

groove 10 adapted to co-act with the ports leading into the tubular members H, H' H'', and a spring is located beneath each valve 6, as indicated by the numeral 12, to keep the valve normally in raised or closed position.

The action of shifting rods R, R' is controlled by these valves 6 as follows:—

When the button 7' for instance is depressed, the valve 6 will move down until the shoulder 9 thereon will be engaged by the slide plate 13 which will hold it in said position. This movement will bring the valve opening 10 over the ports leading to the tubes H' and H'' and establish a communication therethrough, the tube H'' leading to the left end of the cylinder C and the tube H' leading to the valve V in the piston rod R' moving in the lower cylinder C'.

Assuming now that the pistons 20 are to be actuated by a vacuum created in the cylinders C, C', this action will cause the piston 20 in the cylinder C to move against the tension of the spring 21, carrying with it the rod R and shifting the gear carried by said rod, while the valve T will break the communication from the supply S to the tube H. The valve V in the lower rod R' will however remain open, thus establishing a communication from the source S, through the valve V and the tube H', through the valve 10 in the depressed valve 6, and back through the tube H'' to the cylinder C.

Assuming now that it is desired to shift the rod R' and its gear member, this is accomplished by depressing the button 7'', which action will, through the slide member 13, release the valve under the button 7', and allow it to return to closed or raised position, while the valve under the button 7'' will assume the same position above described, that is, the valve opening 10 will open communication through the ports leading to tubes H'' and H, the former leading into the left end of the cylinder C' and the latter to the valve T in the rod R moving in the upper cylinder C. It will be noted therefore that the valve V in the rod R' controls the thumb operated valve for actuating the piston on the rod R, just as the valve T in the rod R controls the thumb operated valve for actuating the piston on the rod R'.

It is evident that, with any of the gears shifted to any desired position, that is with any of the valves 6 in lowered or open position, and when it is desired to throw the pis-

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tons into neutral or central position, it will be necessary only to operate the slide 13 by pressure on the thumb button 15 provided for the purpose, as this will release any of the valves 6 which may be depressed, without the actuation of any other of the valves. A spring 16 tends to keep the slide 13 normally in contact with the valve members 6.

It will be noted therefore that all that is necessary to shift the gears carried by the rods R and R', as for instance the gears on a motor driven vehicle, from one speed to another, is to press the desired button on the cover of the casing 1, and the engaging gear is released just at the same time that the second engagement of gears takes place; the movement is noiseless and without jar or other disturbance.

What I claim is:—

1. A rod shifting device comprising a pair of cylinders, spring backed pistons in the cylinders, rods carried by the pistons, fluid inlets and outlets in each cylinder, valves in said rods, valve ports coacting with said valves and manually operable means in communication with said valves and with said fluid inlets and outlets for controlling said valves, whereby the opening of the valve in one of the rods will permit the movement

of the piston to which the other rod is attached. 30

2. In a device of the character described, a plurality of cylinders, spring backed pistons in the cylinders, rods carried by the pistons, valves in said rods, a source of supply, and spring backed manually operable valves in communication with the cylinders and the valves in the rods, adapted to open a communication from the source of supply, through the valve on one piston rod to the cylinder accommodating the piston on the other piston rod. 35 40

3. In a rod shifting device, the combination of a plurality of cylinders, each end of each cylinder being in communication with a source of fluid supply through a separate, manually operable valve, pistons in the cylinders, whereby the actuation of one of said manually operable valves will control the movement of one of the pistons in one direction, rods carried by the pistons and valves in the rods, each of which controls communication between the source of fluid supply and one or more of said manually operable valves. 45 50 55

In testimony whereof I affix my signature.

RAYMOND F. LANDIS.