Signalizing Device for Motor Vehicles

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Aug. 13, 1940

Filed June 27, 1938

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The present invention relates to improvements in signaling devices for motor vehicles and its principal object is to provide an operating means for a signaling arm that is simple in construction, attractive in appearance, positive in operation and which may be readily applied to a motor vehicle with a minimum effort.

It is proposed, for the purposes of this invention, to use suction means for swinging the signaling arm into any one of the conventional three positions for indicating stop, left and right turn, and to use electric means for controlling the suction means.

It is further proposed to structurally arrange the actuating and control means so that they may be accommodated in a single cylindrical housing in the immediate proximity of the signaling arm and mounted co-axially therewith.

It is further proposed to provide a valve mechanism for causing the suction means to become active on a piston with different effects, and electrical operating mechanism for mounting a unit therewith.

Further objects and advantages of my invention will appear as the specification proceeds.

The preferred form of my invention is illustrated in the accompanying drawing in which:

Figure 1 shows a vertical section through the operating mechanism for my signaling arm, the latter being shown in part only;

Figure 2 is a plan view of the same, a portion being shown in section;

Figure 3 a detail section through a valve block taken along line 3—3 of Figure 4; and

Figure 4 an enlarged plan view of the valve block.

While I have shown only the preferred form of my invention it should be understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

In its preferred form my signaling arm 1 is mounted on a shaft 2 supported in suitable axial bearings 3 in the end walls 4 of a cylindrical housing 5. The latter is preferably made in two semi-cylindrical sections 6 and 7, clamped upon a diametrical partition 8 at 9, whereby the housing is divided into two chambers 10 and 11.

In the chamber 10 a blade piston 12 is mounted on the shaft 2 which latter is accommodated in an axial groove 13 in the partition. This groove is semi-circular in cross-section and allows the inner extreme end of the piston to form a tight closure therewith when the piston moves back and forth in the chamber 10. The outer end of the piston and the sides thereof bear on the peripheral and end walls of the chamber 10 and make airtight contact therewith when the piston reciprocates.

Suction means are provided for actuating the piston which normally occupies the downward slanting position shown in full lines in Figure 5, while the signaling arm is suspended vertically. For actuating the piston I provide three suction ports 14, 15 and 16 arranged at different elevations, as shown in Figure 1, to pull the piston to the elevation of the port through which suction is applied.

The ports are connected, through passages 17', 15' and 16' in one of the end walls of the housing, to ports 17, 18 and 19 in the block 20 disposed in the chamber 11. The latter ports are branches of a main passage 21 in the block which extends longitudinally from one end of the block to a point opposite the last port 19.

The block 20 is rectangular in form and is shaped with a semi-cylindrical recess 22 which fits over the similarly shaped rib 23 of the partition forming the groove 13 previously referred to.

When the block is made to fit snugly on the rib and is pushed up closely to the end wall of the housing the ports 17, 18 and 19 register with the passages 17', 15' and 16' and the block may be secured in this position by means of the screws 24.

The passage 21 in the block is connected, through pipe 25, to any suitable source of negative pressure, such as the manifold of the engine.

For controlling the ports 17, 18 and 19, I drill cylindrical pockets 26 into the block to intersect said ports and I insert into these pockets valves 27 which normally close the ports but are formed with circumferential recesses 29 adapted to open the ports when the valves are retracted.

For retracting the valves I use the solenoid coils 30 arranged on the block in axial alinement with the valves and held in position by means of guide pins 31 projecting from the overhanging flange 32 of a plate 33 secured upon the block as at 34. The guide pins are held in place by screws 35 and enter the outer ends of the coils. They serve as stops for springs 36 which normally urge the valves inwardly.

When the coils are energized, the valves which have a portion made of soft iron, are withdrawn to bring the recess 29 opposite the ports 17 or 18 or 19, respectively. Each coil is connected to the source of energy indicated at 37 and may be independently energized by use of one of the switches 38, 39, 40.
The switches are arranged, of course, within easy reach of the driver. The pockets are provided with small vents at their inner ends to permit air to freely enter and depart. Small vent holes are provided in the wall of the chamber beyond the extreme stroke of the piston. While these holes do not admit enough air to interfere with the suction operation of the piston while the suction means is connected, it allows sufficient air to enter to permit the weight of the signal to return the piston after the suction means has been disconnected.

The operation of my device is as follows:

The piston and the signaling arm are normally in the position indicated in the drawing. If the operator wants to indicate "stop," he closes switch 38 which opens port 17 and allows suction to become active on chamber 10 at port 14. The suction now raises the piston and the signaling arm until the upper face of the piston reaches the port 14. The piston and the signaling arm are held in these positions until the driver opens the switch 38, whereupon the weight of the signal returns the piston to the normal position. In a similar manner the signaling arm may be raised to horizontal and inclined positions for indicating "left" and "right" by operation of the switches 39 and 40.

It will be noted that the entire arrangement is very compact, simple in construction and easy to assemble. The piston is mounted in the end walls of chamber 10. The entire block assembly including the solenoids may be manipulated as a unit and guided into its proper place by following the rib 23 which automatically places the ports 17, 18 and 19 in position for lining up with the passages 14', 15' and 16' when the section 7 is clamped upon the first one.

The signaling arm may be suitably shaped and illuminated, as by neon lights indicated at 43 and a suitable opening 44 is provided in the chamber 10 to allow of free access and exit of air below the piston.

I claim:

1. In a device of the character described, a cylindrical housing having a diametrical partition dividing the housing into two chambers, a radial piston movable in one of the chambers in response to suction, a plurality of suction passages interconnecting the chambers and communicating with the piston chamber at a number of different points for moving the piston into any one of a number of different positions, a block mounted on the partition in the other chamber and having a main suction passage therein, branch passages leading from said main suction passage to said plurality of suction passages to the said points, valves for the branch passages, and means for lining up the branches with said plurality of suction passages when the block is mounted on said partition.

2. In a device of the character described, a cylindrical housing having a diametrical partition dividing the housing into two chambers, the partition being formed to provide an axial groove on one side and a corresponding ridge on the other side, a radial piston pivoted to move in said groove and in the adjacent chamber in response to suction, a plurality of suction passages in an end wall of the housing interconnecting the chambers, a block in the ridge-containing chamber having a suction passage and branches adapted for connection to the suction passages in the end wall, the block having a recess interlocking with the ridge on the partition for lining up the branches with said suction passages in the end wall when the block is pushed up to the end wall, means for fastening the block in adjusted position, solenoid plungers associated with the branches and formed to serve as valves therefor and solenoid coils mounted on the block in operative relation to the plungers for actuating the latter when the solenoids are actuated.

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