

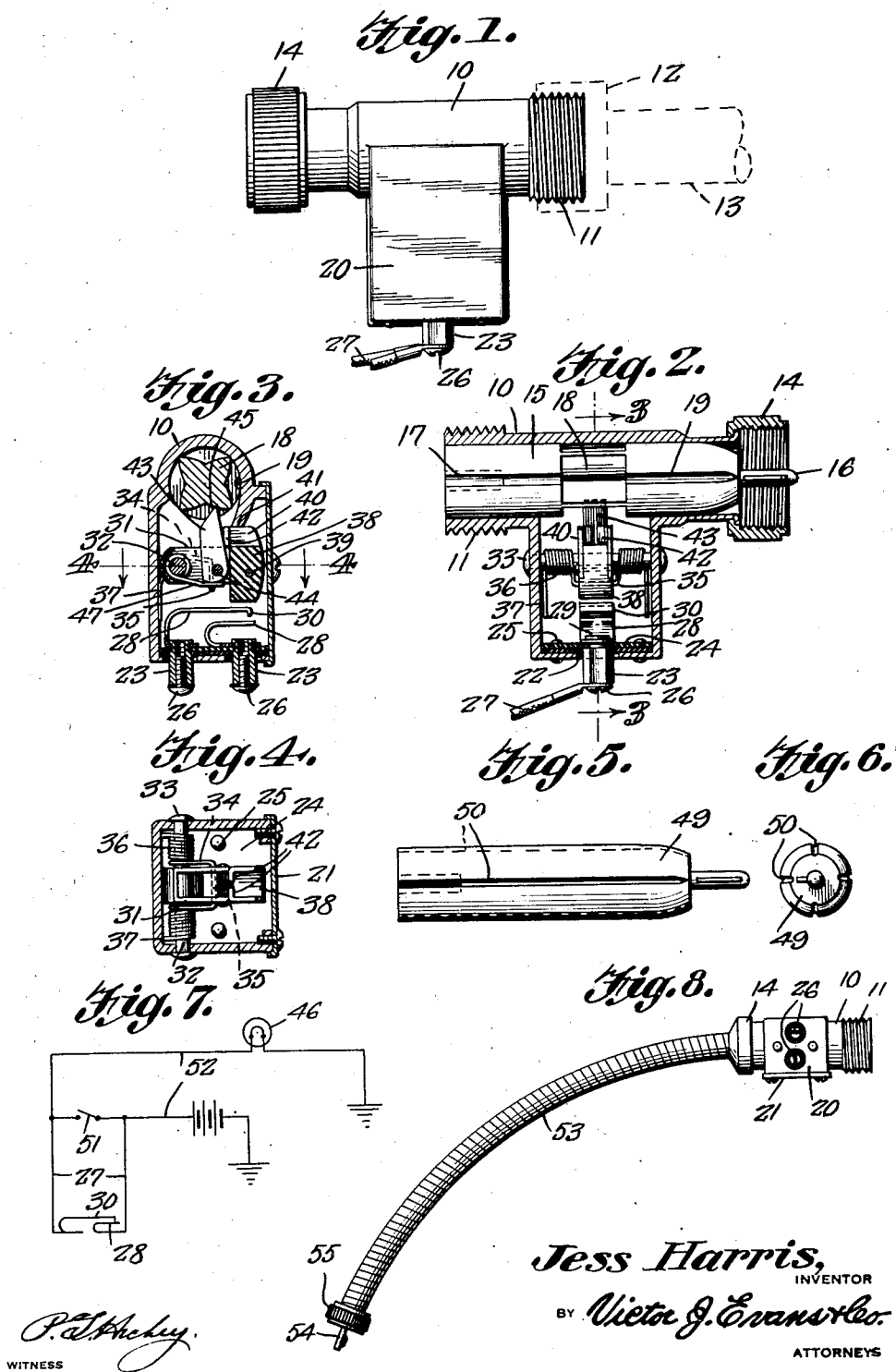
July 13, 1937.

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2,086,800

REVERSE SIGNAL LIGHT SWITCH

Filed May 21, 1936



UNITED STATES PATENT OFFICE

2,086,800

REVERSE SIGNAL LIGHT SWITCH

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Application May 21, 1936, Serial No. 81,080

2 Claims. (Cl. 200—52)

This invention relates to signal lights, and more particularly to signal light switches for motor vehicles, and has for an object to provide a switch which will be operative when the vehicle is backing to energize a signal light and which will be in neutral when the vehicle is moving forward.

A further object is to provide a switch of this character which may be conveniently used with any conventional stop lights and speedometer connections without alterations to the parts.

A further object is to provide a switch of this character which will embody a novel ratchet action to prevent breakage of the parts and promote the long life and durability of the switch.

A further object is to provide a device of this character which will be formed of a few simple and inexpensive parts, which will be easy to manufacture and to install, and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming part of this specification,

Figure 1 is a side elevation of a signal switch constructed in accordance with the invention.

Figure 2 is a longitudinal sectional view of the switch showing the ratchet shaft constructed to cause flickering of the signal lamp.

Figure 3 is a cross sectional view of the switch taken on the line 3—3 of Figure 2.

Figure 4 is a cross sectional view of the switch taken on the line 4—4 of Figure 3.

Figure 5 is a side elevation of a modified form of ratchet shaft for holding the signal light circuit closed without flickering.

Figure 6 is an end elevation of the shaft shown in Figure 5.

Figure 7 is a diagrammatic view showing the electrical connections of the device.

Figure 8 is a side elevation of the switch shown in Figure 1 in a modified form the same being equipped with an extended flexible armor which houses a flexible extension of the ratchet shaft, whereby the switch may be located remote from the transmission.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates a tubular

housing having screw threads 11 on one end to receive a cap nut 12 on the speedometer chain housing 13. The opposite end of the housing 10 is provided with a swivel cap nut 14 for attaching the housing to the transmission case of the vehicle.

A ratchet shaft 15 is rotatably mounted in the housing and is provided at one end with a key extension 16 for operatively connecting the shaft to a conventional transmission, and is provided in the opposite end with a key slot 17 adapted to be connected to the actuating chain of a conventional speedometer. The shaft is thus rotated in one direction when the vehicle moves forward and is rotated in the opposite direction when the vehicle is being backed. The shaft is provided intermediate its ends with ratchet teeth 18 of substantially involute contour as best shown in Figure 3. The points of the teeth are substantially flush with the cylindrical surface of the shaft while the bases of the teeth are considerably below the cylindrical surface of the shaft. This construction of ratchet has been found in practice to be highly effective in preventing the pawl of the circuit closer from becoming jammed and broken. The shaft is provided with an oil groove 19 which extends from end to end of the shaft.

A casing 20 is formed integral with the housing 10 and is provided with a removable cover 21 to permit access to the interior thereof when desired. The casing communicates with the tubular housing 10 at the ratchet teeth 18, as best shown in Figure 2. The bottom of the casing is provided with openings 22 to receive tubular terminals 23 that are fixed to blanks 24 of insulating material secured to the casing by rivets 25 or other connectors. The terminals receive screws 26, as best shown in Figure 3, by means of which circuit wires 27 may be attached to the terminals. A pair of resilient switch contacts 28 are disposed within the casing to extend substantially parallel with each other and these contacts are curved remote from their free ends and perforated to receive the terminals 23 to which they are electrically connected by rivet heads 29 formed on the terminals, as best shown in Figures 2 and 3. The tip 30 of one of the switch contacts is directed toward and impinges against the other switch contact as best shown in Figure 3, to deform the latter and make good electrical connection therewith.

The circuit closing arm 31 is substantially U-shaped and a pivot pin 32 is passed through the branches of the arm and has its ends journaled

in openings in the walls of the casing 20 and then headed up as shown at 33 in Figure 4. A U-shaped spring 34 has the bight engaged underneath the branches of the circuit closing arm as shown at 35 and the legs of the spring are provided with helical coils 36 which are disposed on the pivot pin 32 and terminate in downwardly extending ends 37 which bear against the wall of the casing 20 and tension the spring to normally hold the circuit closing arm raised to neutral position which is the position it assumes when the vehicle is traveling forward.

A hammer head 38, of insulating material, is fixed to the free ends of the branches of the circuit closing arm by means of a rivet 39 or other connector, and this hammer head impinges against and closes the spring switch contacts 28 at each downward movement of the circuit closing arm, the hammer head withdrawing from the contacts when the arm is returned by its spring to neutral position.

A pair of ears 40 extend upwardly from the free ends of the legs of the circuit closing arm, as best shown in Figures 2 and 3, and perform the function of stops to engage against an edge 41 of the tubular housing 10 to limit upward movement of the circuit closing arm. These ears are provided on their rear edges with flanges 42 which are directed toward each other as best shown in Figure 3, and perform the function of stops to limit movement of the pawl 43 under action of its controlling spring as will now be described.

The pawl 43 is pivoted at one end between the branches of the circuit closing arm by means of a pivot pin 44. The opposite end of the pawl is beveled as shown at 45 to provide a cam face over which the ratchet teeth 18 ride in sequence when the vehicle is being moved backward to push down the pawl and rock the circuit closing arm to strike the hammer head 39 against the contacts 28 for closing the circuit of signal light 46. As each tooth rides over the tip of the pawl the latter may ride down the rear side of the tooth under urge of the controlling spring 34 of the circuit closing arm and simultaneously therewith the hammer head is raised to disengage from the switch contacts 28 and open the circuit to the signal light. This alternate opening and closing of the circuit produces a flickering of the signal light as will be understood.

When the vehicle is moving forward the ratchet teeth 18 are rotated in a direction counter to the direction just described and thereupon the ratchet teeth 18 ride over the pawl 43 thereby moving the pawl backward against the pressure of a leaf spring 47 one end of which is looped around the pivot pin 32 of the circuit closing arm and the other end of which bears against the bottom of the pivoted end of the pawl. As each tooth rides off of the pawl the pawl is returned to normal position against the stop flanges 42 by its controlling spring 47.

If a steady glow signal light is desired the ratchet shaft 49 shown in Figure 5 may be substituted for the ratchet shaft 15. The ratchet shaft 49 is similar in all respects to the ratchet shaft 15 with the exception that the ratchet teeth 18 are dispensed with and in lieu thereof longitudinal shallow grooves 50 are formed in the cylindrical surface of the shaft from end to end thereof. The tip of the pawl 43 while riding on the cylindrical surface of the ratchet shaft holds the circuit closing arm against the switch contacts 28 to maintain the circuit to the signal light closed

when the vehicle is in reverse motion. The tip of the pawl will ride into the grooves 50 successively but will immediately ride out again so that the circuit closing arm holds the contacts firmly closed. When the vehicle is moving forward the walls of the grooves 50 ride over and rock the pawl on its pivot without danger of any binding of the parts.

Figure 7 shows a conventional signal stop light 46 and stop light switch 51 operated when the brake is applied. The switch contacts 28 are connected to the stop light circuit wires 52 in parallel with the switch 51, as shown to cause the stop light to flicker when the motor vehicle is in reverse motion.

In Figure 8 the signal light switch is shown in a modified form for the purpose of convenience in attaching the switch to any type of motor vehicle. The parts of this switch are identically the same as those of the switch previously described with the exception that the switch is equipped with a flexible armor extension 53 of the housing 10, which houses a flexible extension of the ratchet shaft, the latter terminating in a key 54 which may be operatively connected to the transmission mechanism and held in place by a swivel nut 55. The screw threads 11 of the housing 10 receive a cap nut 12 on the speedometer chain housing 13 the same as shown in Figure 1.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What is claimed is:

1. A switch comprising a tubular housing, a shaft rotatably mounted in the housing, a casing on one side of the housing having an opening therein, longitudinal ratchet teeth on the shaft exposed through said opening, a substantially U-shaped spring pressed circuit closer arm pivotally mounted in the casing and normally disposed in neutral position, a circuit closing hammer head carried by the arm, switch contacts in the casing closed by impact of the hammer head therewith, a spring pressed pawl pivoted between the legs of the circuit closer arm and engaging said ratchet teeth, an upstanding ear on the arm engageable against the edge of said opening in the casing to limit movement of the arm to open circuit position, and a flange on the ear above the hammer head forming a stop against which the pawl engages when the shaft is rotated in a reverse direction to depress the pawl and move the circuit closer arm to circuit closing position, said pawl being displaced by said ratchet teeth against the tension of its controlling spring when the shaft is rotated in a forward direction and imparting no movement to the circuit closer arm.

2. A switch comprising a tubular housing, a shaft rotatably mounted in the housing and extending longitudinally throughout the housing, a casing on one side of the housing having an opening therein, substantially involute ratchet teeth on the shaft exposed through said opening, the points of the teeth extending flush with the surface of the shaft and the bases of the teeth extending below the surface of the shaft, a substantially U-shaped spring pressed circuit closer arm pivotally mounted in the casing and normally disposed in neutral position, a circuit closing hammer head carried by the arm, switch contacts in the casing closed by impact of the hammer head therewith, a spring pressed pawl pivoted between the legs of the circuit closer arm and en-

gaging said ratchet teeth, an upstanding ear on the arm engageable against the edge of said opening in the casing to limit movement of the arm to open circuit position, and a flange on the ear above the hammer head forming a stop
5 against which the pawl engages when the shaft is rotated in a reverse direction to depress the

pawl and move the circuit closer arm to circuit closing position, said pawl being displaced by said ratchet teeth against the tension of its controlling spring when the shaft is rotated in a forward direction and imparting no movement to the circuit closer arm. 5

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