March 18, 1941. F. THIEL 2,235,181

TRAFFIC SIGNAL

Filed Sept. 5, 1939

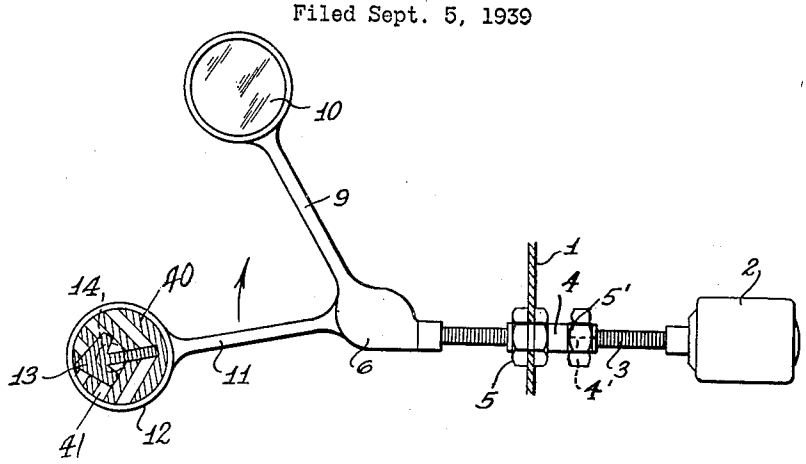

Fig. 1.

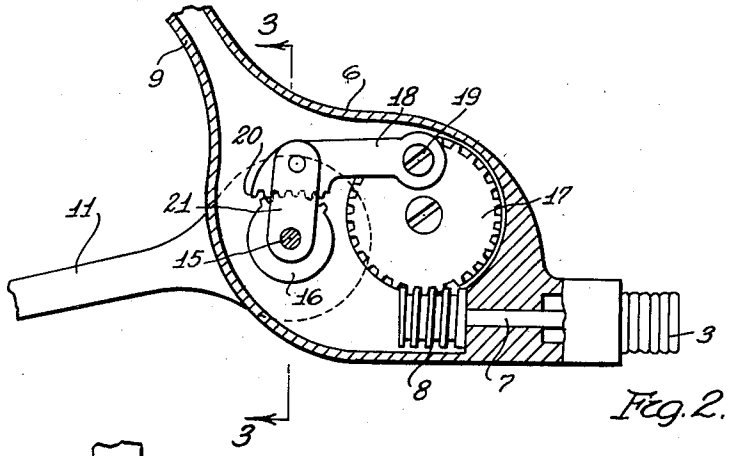

Fig. 2.

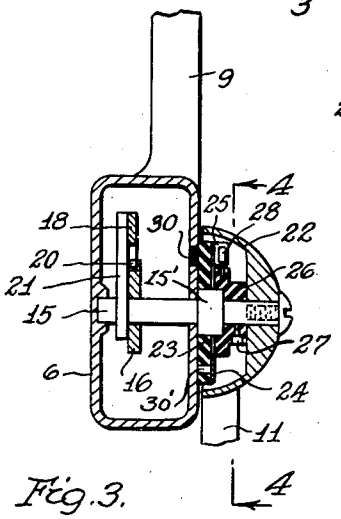

Fig. 3.

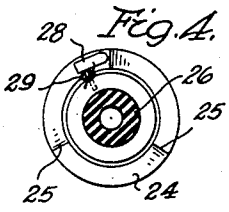

Fig. 4.

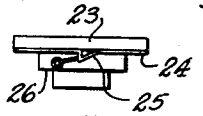

Fig. 5.

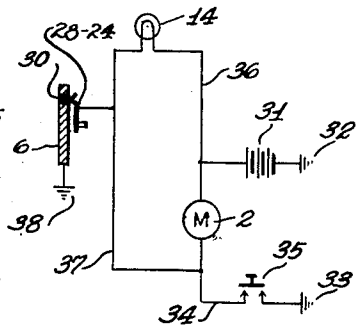

Fig. 6.

INVENTOR.
Frank Thiel
BY Samuel Weisman
ATTORNEY.

Patented Mar. 18, 1941

2,235,181

UNITED STATES PATENT OFFICE

2,235,181

TRAFFIC SIGNAL

Frank Thiel, Detroit, Mich.

Application September 5, 1939, Serial No. 293,333

1 Claim. (Cl. 200—52)

The present invention pertains to a novel signaling device for motor vehicles and is suitable for use on trucks as well as passenger vehicles.

The principal object of the invention is to provide a signal that is both illuminated and movable and which automatically stops after making a predetermined number of oscillations without further attention by the driver after the starting operation of pressing a switch. Another object of the invention is to provide a device of this character, which, when idle, is concealed behind the usual side view mirror. Thus, this signal is also within view of the driver and he can see directly whether or not the signal is operating, thereby dispensing with a pilot light or similar auxiliary signal.

A further object of the invention is to provide a simple and inexpensive mechanism for effecting the automatic operation described above.

In the accomplishment of these objects the signal is in the form of an arm pivotally attached to the lower end of the bracket arm of the side view mirror. This end is constructed in the form of a housing containing the operating mechanism.

The circuit for the actuating motor is grounded through this housing. The motor is geared to the arm through a suitable oscillating linkage. The circuit also comprises a contact piece which oscillates with the arm and another contact member in the nature of a ratchet driven by the first contact member as a pawl. The ratchet member is in electrical contact with the housing, but the latter has a dead or insulated spot engaged by the ratchet member once during each revolution of the latter, and thus breaking the circuit once in each revolution. The number of ratchet teeth determines the number of oscillations made by the arm in each operation.

The operating motor is also comprised in another circuit having a starting switch in the form of a spring-returned push button. Thus, the motor can turn the ratchet off from the dead spot in the housing, and thereafter another circuit is established through the motor and housing to continue operating the device. The starting motor circuit has in the meantime been opened by return of the push button to open position.

The invention also embodies a unique oscillating linkage so constructed as to reduce to a minimum the amount of play in the oscillating arm and also to increase the amplitude of the oscillation.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing in which:

Figure 1 is an elevation of the device;

Figure 2 is a section, in a parallel plane, of the housing and illustrating the oscillating mechanism;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a side view of the pawl and ratchet contact device and,

Figure 6 is a wiring diagram.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

In Figure 1 the numeral 1 designates generally a suitable portion of the side wall structure of a motor vehicle for supporting a side view mirror. Within the vehicle is suitably mounted a small electric motor 2 having a flexible shaft armor 3 passed through a bushing 4 extending through the wall 1 and fastened therein by nuts 5.

To the outer end of the armor 3 is secured a metal housing 6, and additional supporting means may be provided if the armor is likely to bend under the weight of the casing 6 and associated parts. The motor shaft 7 extends into the casing, in which it is journaled as shown in Figure 2, and carried a worm 8 at its free end. An arm 9 extends from the casing 6 at a suitable angle and carries a side view mirror 10 constructed and employed in a manner well known in the art. To the casing 6 is pivotally attached a signal arm 11 terminating in a head 12 on which is depicted a suitable signal 13, such as an arrow, which may also be illuminated by a lamp 14 if desired.

The pivotal attachment of the arm 11 to the casing 6 is made by means of a shaft 15 journaled in the casing 6 and fixed to the arm, as illustrated in Figure 3. Within the casing, a gear segment 16 is fixed to the shaft, for a purpose which will presently be described.

In the casing 6 is also journaled a worm gear 17 meshing with the worm 8, as illustrated in Fig. 2. A link 18 is articulated at one end 19 to the gear 17 and has its free end formed as a toothed rack 20 meshing with the gear segment 16. A free link 21 is loosely mounted on the shaft 15 and pivotally attached to the link 18 in order to hold the rack 20 in firm engagement with the gear segment.

In the operation of the device as thus far

described, it will be evident that rotation of the gear 17 by the motor-driven worm 8 causes the gear segment 16 to oscillate, and with it the shaft 15 and signal arm 11. The gearing is so dimensioned and the signal arm so positioned that the latter is concealed behind the mirror arm 9 at the upper limit of the oscillation. The gear tooth connection between the member 16 and the rack 20 eliminates play that would otherwise occur in the oscillation of the arm 11. Further, the gear arrangement increases the amplitude of the oscillation for a given relation of centers, since substantially the whole of the rack 20 is beyond one or the other end of the teeth of gear 16 at the limits of the oscillation.

The pivot end of the signal arm 11 is also formed as a housing 22 to contain certain electrical parts which are assembled before the arm is applied on the shaft 15. An insulated disk 23 is loosely mounted on an enlarged portion 15' of the shaft 15. This disk has one face engaging the casing 6 and its other or exposed face fitted with a conducting ring 24. The latter is formed with a predetermined number of equidistant steps 25 which function as ratchet teeth in a manner presently to be described. Adjacent to the disk is another insulating member 26 fixed to the shaft by a set screw 27. Extending from the circumference of the member 26 is a pivotally mounted angular contact finger or brush 28 maintained in frictional engagement with the ring 24 by a spring 29.

In the operation of this portion of mechanism, the member 26 with the brush 28 obviously oscillates with the shaft 15. In doing so, it engages successive steps 25 on successive oscillations. The parts are so dimensioned that the amplitude of oscillation of the member 28 is substantially equal to the distance between adjacent steps 25. Thus, the member 28 acts as a pawl on the ring 24 as a ratchet and drives the ring and disk 23 through one revolution when all of the steps have been once engaged.

The wall of the casing 6 engaged by the disk 23 has a dead or insulated spot 30, as shown in Figure 3 and a contact pin 30' extends from the ring 24 through the disk and into engagement with the wall of the casing. Thus, the pin 24 is grounded through the casing except when in engagement with the dead spot 30, and the latter is so located as to be thus engaged after one revolution of the disk 23 in the manner described.

As shown in the wiring diagram in Figure 6, one side of the motor 2 is connected to the battery 31 which is grounded at 32. The other side of the motor is grounded at 33 through a conductor 34 in which is interposed a spring-return switch 35. The motor is started on closing the switch, but this particular circuit is held enclosed only momentarily.

Another conductor 36 extends from the battery or input side of the motor through the lamp 14 and to the oscillating brush 28. Another conductor 37 extends from the brush to the other side of the motor. The casing 6 is represented at 38 as being grounded, it being understood that the grounds 32 and 33 are comprised in the metallic structure of the vehicle as in ordinary practice.

The starting of the motor is sufficient to move the pin 30' off the dead spot 30, whereupon a circuit is completed through the battery, motor, conductor 37, brush 28, ring 24 and casing 6 independently of the switch circuit. A similar circuit is at the same time made through conductor 36 and lamp 14. Both circuits are broken when the pin 30' returns to the dead spot 30, and for the next operation, the switch circuit is employed to start the motor and take the pin 30' off the dead spot 30 as already described.

The conductors may conveniently be housed within the armor 3 and the signal arm 11, especially for connection to the oscillating brush 28 and the lamp 14.

For assembly purposes, one end of the sleeve 4 is split at 4' and tapered, with a nut 5' threaded thereon to tighten the sleeve on the shaft 4 in any desired position of adjustment.

It will be seen in Figure 1 that the signal head 12 is striped red at 40 and white at 41, while the arrow 13 is also red. The striping is preferably opaque and the arrow transparent. Thus, although the illuminated arrow may not be conspicuous in daylight, the opaque striping presents a very effective signal.

When idle, the signal arm is inconspicuous since it is concealed behind the mirror arm 9. Further, it is within view of the driver who can observe its operation directly and without resorting to a pilot light or similar indicator. The device is constructed of a relatively small number of simple and inexpensive parts and is quickly installed on a vehicle.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alternations in the details of construction may be made without departing from the scope of the invention, as indicated by the appended claim.

What I claim is:

An oscillating device comprising a fixed support, a shaft journaled therein, means for oscillating said shaft, a conducting brush carried by said shaft, a conducting ring loosely mounted on said shaft and engaged by said brush, said ring having spaced steps engageable successively by said brush, whereby said ring is rotated by oscillation of said brush, a conductor extending from said ring into engagement with said support, said support having an insulated spot engageable periodically by said conductor.

FRANK THIEL.