W. K. HOWE.

TRAFFIC CONTROLLING DEVICE.

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1,012,080. **Patented Dec. 19, 1911.**

Fig. 1.

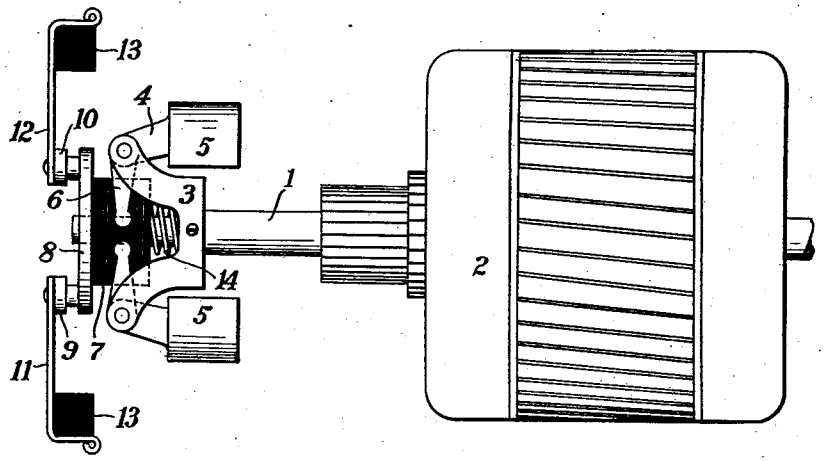
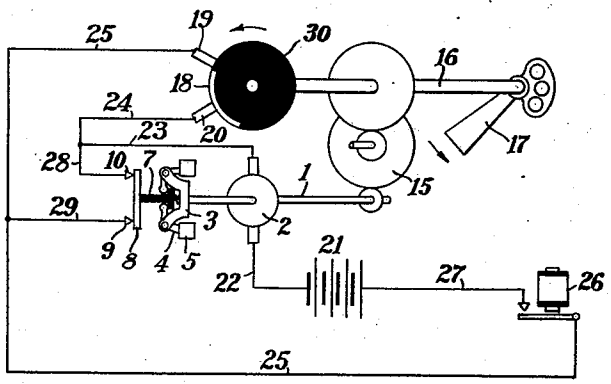


Fig. 2.



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TRAFFIC-CONTROLLING DEVICE.

1,012,080. Specification of Letters Patent. **Patented Dec. 19, 1911.**

Original application filed December 3, 1909, Serial No 531,264. Divided and this application filed May 28, 1910. Serial No. 563,945.

To all whom it may concern:

Be it known that I, WINTHROP K. HOWE, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Traffic-Controlling Devices, of which the following is a specification.

This invention relates to mechanism for operating railway-traffic controlling devices, such as signals and the like, and it is particularly useful in connection with electrically-operated apparatus for actuating semaphores.

It is necessary or desirable that railway-traffic controlling devices, such as semaphores, be moved rapidly from one position to another, particularly in the case of semaphores which are used in automatic block-signal systems, since in such systems the available time for the operations of the semaphore is short, owing to the rapidity with which an express train passes through a signal block. It is equally desirable, however, that the movements of the semaphore or other traffic-controlling device, though rapid, may be arrested without undue shock or strain to the mechanism.

The object of the present invention is to produce a mechanism for actuating a traffic-controlling device in a minimum time but without such shock or strain, and to this end I so arrange my mechanism that during a portion of the movement of the traffic-controlling device from one position to another the mechanism moves at full or maximum speed, but after the attainment of a predetermined point in the operation of the device the speed of the mechanism is reduced and controlled in such a manner that the mechanism does not have an undue velocity at the time when its movement is arrested or terminates.

The method of operation just described is applicable to various traffic-controlling devices, and in the case of a semaphore it may be employed in connection with the movements of the semaphore in either or both directions. In the illustrated embodiment of the invention, however, I have shown a mechanism adapted to operate in the novel manner of the present invention during the movement of the semaphore from danger to clear position, and I have illustrated the invention as applied in connection with an electric motor by which the semaphore is actuated, although the invention in its broadest aspects is applicable to motors of other types.

In the drawings:—Figure 1 is a side elevation of the armature and armature shaft of an electric motor, together with a centrifugal governor mounted on the shaft and a circuit-controller actuated by the governor; and Fig. 2 is a diagram showing the general arrangement of a semaphore-actuating mechanism embodying the governor and circuit-controller of Fig. 1.

In using the present invention in connection with an electric motor, I employ, as shown in Fig. 1, a centrifugal governor of a general form which is well known, this governor being mounted upon the shaft 1 of the armature 2 of the motor. The governor comprises a yoke 3 fixed to the armature shaft and carrying pivoted arms 4 upon which are mounted governor weights 5. The arms 4 are integral with inwardly-extending arms 6 which engage slots in a drum 7 of insulating material, which is mounted to slide upon the reduced end of the armature shaft. Fixed to the drum 7 is a metal plate 8 which constitutes a conductor of the circuit-controller. Coöperating with the plate 8 are two fixed contacts 9 and 10 which are mounted, respectively, on conductive arms 11 and 12. The arms 11 and 12 are fixed to suitable insulating supports 13. A compression spring 14 located between the yoke 3 and the drum 7 tends constantly to force the drum and the plate 8 along the shaft in a direction to maintain the plate in engagement with the fixed contacts 9 and 10, so that as the armature shaft rotates the plate 8 remains in engagement with the fixed contacts, having thus a wiping contact with them and maintaining a closed circuit. When the speed of the armature reaches a certain point, however, the centrifugal action of the weights 5, communicated through the arms 4 and 6, overcomes the spring 14, and presses the drum 7 to the right along the armature shaft, thereby disengaging the plate 8 from the fixed contacts and breaking the circuit.

The general arrangement of parts illustrated in Fig. 2 is that which is common in electrically-operated semaphore mech-

anisms. Here the armature shaft 1 is connected, by gearing 15, with a shaft 16 carrying the semaphore 17. Mounted upon or connected with the semaphore-shaft is the usual circuit-controller, which comprises, in the present instance a drum 30 of insulating material. This drum carries a contact strip 18 coöperating with two fixed contacts 19 and 20. The motor 2 is energized by the usual electric battery 21, which is connected with the motor through a wire 22. The return from the motor passes through a wire 23, and thence branches through two paths. One path is by way of a wire 24, through the fixed contacts 20 and 19 and the contact strip 18, and thence, through a wire 25, which may be a line wire, to a circuit controller 26, which may be the ordinary signal relay, or any other device for controlling the operation of the semaphore. From the relay the current returns through a wire 27, which may be a line wire, to the battery. The other path for the return current is through a wire 28 to the fixed contact 10 of the governor-actuated circuit-controller, through plate 8 to fixed contact 9 and, from the fixed contact 9, through a wire 29 to the wire 25, and thence as in the case of the first-described path.

When the semaphore 14 stands in horizontal danger position, which is its normal position, the contact strip 18 engages the fixed contacts 19 and 20. At this time, if the relay 26 be energized, the motor is energized through the circuit above described, and the motor then acts to move the semaphore toward the clear position, in the direction indicated by the arrow in Fig. 2, while the circuit-controller drum 30 rotates in the direction similarly indicated. The motor almost immediately attains a speed sufficient to cause the governor to open the circuit at the contacts 9 and 10 as above described, but during the first portion of the semaphore movement the contact-strip 18 remains in engagement with the contacts 19 and 20, so that the current has an unbroken return through the wires 23, 24 and 25. After the semaphore has attained a predetermined position, near the end of its clearing movement, however, the contact-strip 18 disengages the contact 19, thereby restricting the current to a return through the circuit-controller connected with the governor. The speed of the motor is thereupon immediately reduced to the point at which the governor permits the circuit-controller to be closed sufficiently to maintain the necessary current through the motor, and the semaphore thus completes its clearing movement at a speed sufficiently reduced to avoid undue shock or strain when the movement of the semaphore is completed.

I am aware that it has been previously proposed to provide a semaphore mechanism with a movement-checking device or brake arranged to operate only during the latter portion of the movement of the semaphore to danger position in response to its bias. In the construction so proposed, however, a braking device in the form of a dash-pot is employed, and this device does not operate, therefore, as a governor, that is, as means for reducing the speed of the semaphore to a predetermined limit regardless of varying conditions in the mechanism. In consequence of this deficiency, such a device will not secure uniform results, but the speed with which the semaphore moves when under the control of the braking device may vary widely and under certain conditions, and where the bias of the semaphore is substantially reduced by the presence of ice and snow on the semaphore or by other well-known causes, the resistance to its movement presented by the braking device may be substantially greater than is necessary or desirable. In my arrangement, however, I employ a device which governs the speed of the semaphore as distinguished merely from opposing resistance to it, that is to say, the speed of the semaphore is reduced to a predetermined degree regardless of varying conditions in the mechanism, and this constitutes a novel and valuable feature of the present invention.

This application is a division of my copending application filed December 3, 1909, Serial No. 531,264.

I claim:—

1. Traffic-controlling mechanism comprising a movable traffic-controlling device, means connected therewith for governing the movement of said device during the latter portion of said movement to secure a predetermined speed therein, said means being inoperative during the first part of the movement, and means for throwing the governing means into operation during the latter portion of said movement.

2. Traffic-controlling mechanism comprising a movable traffic-controlling device, a motor connected and movable therewith, and means for governing the speed of the motor to secure a predetermined speed therein, said means being connected with said device and being inoperative during the first part of the movement thereof, but being thrown into operation by the movement of said device during the latter part of said movement.

3. Traffic-controlling mechanism comprising a movable traffic-controlling device, a rotary electric motor connected thereto and movable therewith a centrifugal governor actuated by the motor, a circuit-controller actuated by the centrifugal governor, and a second circuit-controller con-

nected electrically with the motor and the first-mentioned circuit-controller and connected mechanically with the traffic-controlling device so as to be actuated in accordance with movements of the traffic-controlling device to throw the first-mentioned circuit-controller into operation to reduce the speed of the motor after the traffic-controlling device has attained a predetermined point in its movement.

4. Traffic-controlling mechanism comprising a movable traffic-controlling device, means including a centrifugal device actuated by the traffic controlling device for governing the movement of said traffic controlling device during the latter part of its movement, to secure a predetermined speed therein, said means being inoperative during the first part of said movement, and means actuated by the traffic-controlling device for throwing the governing means into operation.

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