Y. McKINZIE.

RAILWAY CROSSING SIGNAL.

APPLICATION FILED MAY 31, 1917.

1,354,981. **Patented Oct. 5, 1920.**

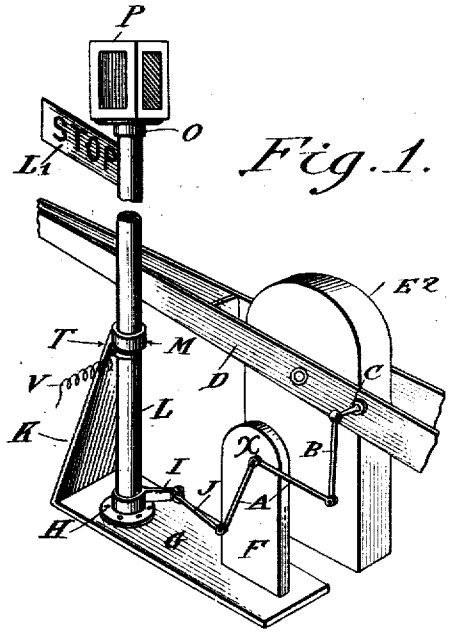
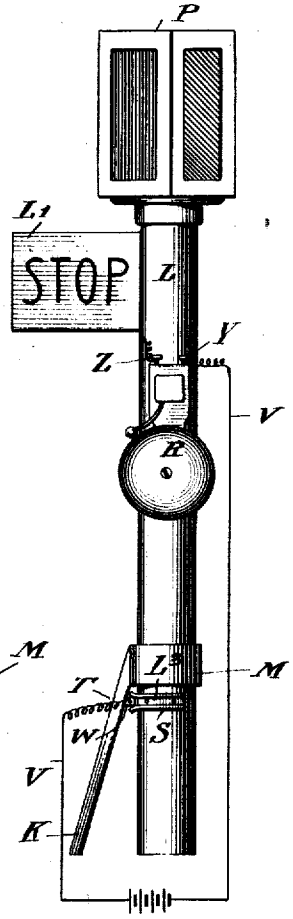


Fig. 1.

Fig. 2.



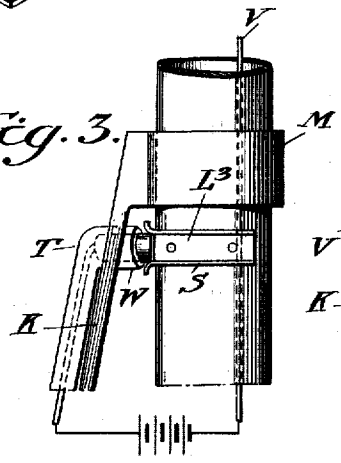


Fig. 3.

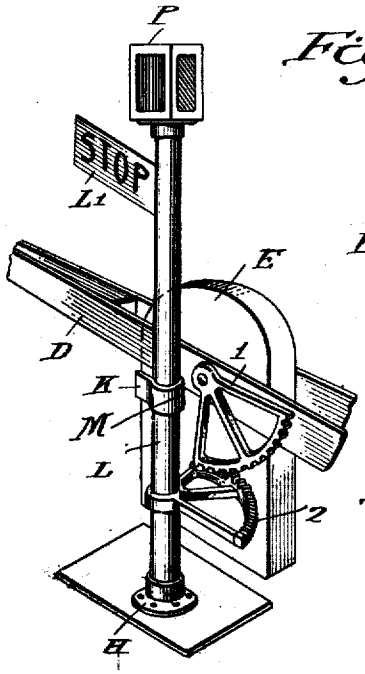


Fig. 4.

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UNITED STATES PATENT OFFICE.

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RAILWAY-CROSSING SIGNAL.

1,354,981. Specification of Letters Patent. Patented Oct. 5, 1920.

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To all of whom it may concern:

Be it known that I, YODER McKENZIE, a citizen of the United States, residing in Louisville, Jefferson county, Kentucky, have invented new and useful Improvements in Railway-Crossing Signals, of which the following is a full and complete specification.

Figure 1 is a perspective view of one form of my invention, the end of the gate not being shown, nor certain portions of the signal-post. Fig. 2 is a view of a part of the signal post, Fig. 3 showing details of the contacts for the operation of the signal bell, and Fig. 4 shows another form of applicant's device than the preferred form first illustrated.

Similar letters and figures refer to similar parts throughout the several views.

My invention relates to signals designed to safeguard the public, especially at places where street traffic crosses a railway track at grade, and capable of being used in connection with crossing gate structures. It is usual at such points for the railroad to provide crossing-gate structures having movable parts, including a movable gate or gates, designed to be out of the way of traffic when in one position, and in other positions to act as a bar to traffic. When a train is approaching or passing, the gate is kept in the position of a crossing bar. Such gates are made in many forms, one of which only is illustrated here, although applicant's device is adaptable to all. In these structures the gate mechanism is operated by some external force, usually controlled by a watchman. While such watchmen are usually attentive, they are not infallible, and through mischance or human imperfection sometimes fail to lower the gates when needed. When this occurs serious accidents frequently result, because those using the crossing grow to rely on the operation of the gates, and because the persons operating locomotives rely on the bar being in place. To avoid such accidents, and to provide an attachment to already installed crossing gate structures which can be attached without any extensive changes, and to attain other desirable purposes hereinafter set out, applicant's device is provided.

In the preferred form illustrated in Fig. 1, the crossing-gate D is carried by the standard E_2, the means of operating the gate D not being shown. Close to the standard E_2 is placed a support F and nearby, in suitable position, a vertical post L is mounted so as to be rotatable, in a support G, provided with a socket H and a guide M, supported by a brace K. The form illustrated in Fig. 1 is useful and preferred but my invention is not confined to these particular features as here worked out. Near the top of the post L is attached a semaphore arm L_1 here rigidly attached to the post L, and extending horizontally; so that a partial rotation of the post L results in a corresponding orientation of the semaphore L_1. The post L is also provided with a semaphore lantern P, showing on opposite sides light of a color understood as a blocking signal and on the intermediate sides, light of some color conventionally used to indicate that passage is clear, this lantern being adapted to rotate as the post rotates. A bell R is also provided, preferably adapted to be operated by an electric current, and an apparatus is provided whereby the continuity of the electric circuit, and hence the sound produced thereby, is dependent on the position of the post L. A contact piece S, is attached to the post L_3 and in electrical contact with the metal post L, to which one of the terminals Z of the bell R is attached. A wire indicated by V leads from the other bell terminal (a source of current being interposed) to the contact piece W, having a part adapted to close the circuit when in contact with the contact piece S. While the post L is in such a position that the contact piece W is in contact with the flanges of the contact pieces S the bell will continue to ring, and when the circuit is broken by the contact piece S being turned so that its flanges are no longer in contact with the contact piece W, the bell ceases ringing.

The motion of the post L and of the lantern P and the semaphore arm L_1, as well as the sounding of the bell, are made to depend wholly on the movement of the movable parts of the crossing gate structure and preferably on the movement of the crossing gate D itself as here illustrated. This is accomplished, as illustrated in Fig. 1, by means of a bell crank A which is pivoted at X to the support F. A link B connects one arm of the bell crank A, with the crossing gate D, being attached by means of the part C so that motion of the crossing gate D ac-

tuates the bell-crank A, and tends to move it about the pivot X. The other arm of the bell-crank A is connected with the link J, which in turn is connected with an arm I rigidly attached to the post L. By means of this system, motion of the crossing gate D is transmitted to the post L_3 so as to cause partial rotation of the same, towit, a one-quarter rotation. The apparatus is adjusted so that when the gate is in such position as to act as a bar to traffic, the semaphore arm L_1 is parallel to the direction of the railway track, and perpendicular to the direction taken by vehicles in crossing and the safety lights show up and down the track.

As the gate is changed in position, the post L and its semaphore L_1 change position, until, when the gate is fully out of the way of traffic, and at its ultimate position, out of the way, the semaphore L_1 is perpendicular to the tracks, standing as a warning to the locomotive driver not to proceed, and the blocking-color signal is visible up and down the track. The contact mechanism of the bell R is adjusted so that, in the case of a pivoted crossing gate of the type shown, the bell R begins to ring as the gate commences to descend, and continues to ring until the gate is returned to the same position. The use of my invention is not limited to a position for the attachment, close to the gate structure; on the contrary, the signal support or signal apparatus may be set up at a distance along the track, so as to be of service at other crossings, or to give earlier notice to engineers.

My invention is not confined to the particular embodiment here illustrated, but the novel ideas may be applied in a variety of ways.

It will be seen that the operation of the gate, when the apparatus is connected up, will operate the signals so that the engineer of an approaching train will know that the gate is barring traffic and it is safe to proceed. On the other hand, if the gate fails to work, either by reason of being out of order or by reason of the default of the tender, the engineer is warned by the signal that unusual conditions prevail and require unusual caution. It will be noticed that except for the connections by which the movement of the gate is made to operate the signal, the crossing-gate apparatus and the signal apparatus are not necessarily dependent, and the signal apparatus, and the means whereby it is operated, may be detached from the crossing gate apparatus without impairing the operation of the latter. Furthermore, the signal apparatus, being on an independent support from the crossing gate apparatus, is detachable, and operable by hand, even should the gate fail to work. The preferable height at which the semaphore arm should be maintained is such a height as to be approximately on a level with the eyes of the engineer driving the locomotives, that is, about twelve feet high, and the semaphore lantern should preferably be about the same height.

My device operates not only as a warning to the engineer, but also serves to indicate to the traveling public making use of the crossing, whether or not the gates are down or up, or beginning to go down. Thus, as stated, the bell signal is preferably set so as to begin to ring when the gate begins to descend, thus warning drivers of vehicles, even before the gate is in position actually to bar traffic, that the gates are descending. This operates to prevent breaking of the gates, or inclosing traffic between the gates. The visible signals also serve to make it possible for drivers of vehicles to know long before they reach the railroad, whether the gates are down or up.

I am aware that a combined gate and signal has been heretofore invented, but my device is an improvement in many ways over any heretofore made. The facility with which the signal and gate apparatus may be separated, the fact that my device depends for its motion not on any automatic action, but on the movement of the gate itself, make it a peculiarly reliable indicator of conditions. When gates and signal are part of the same closely related structure, the failure of one to operate usually makes the whole system unreliable, but in my device, the failure of the crossing gate apparatus to function leaves the signal apparatus still intact, and capable of separate operation. My signal device, unlike others, provides an attachment for use with crossing gates of ordinary types, now installed, without substantial change, and is adapted to be used when bulky counter weights are employed to balance the gate.

Fig. 4, as stated, shows another form of applicant's device than the preferred form hitherto described in detail, and illustrated in Fig. 1. The form illustrated in Fig. 4 utilizes a gear wheel 1 (it is not essential to have a complete wheel) having its axis coincident with the axis of the pivot of the pivoted gate, and so attached as to turn with the gate. The gear-wheel 2 is attached to the signal post L, and turns with it, the axes being coincident. (It is not essential here, either, to have a complete gear wheel.) The two gear wheels 1 and 2 are so formed and placed that their axes are at right angles and their teeth mesh, so that a turning of the wheel 1 with the gate D results in a turning of the post L. In this form as illustrated in Fig. 4, it will be noticed that the guide M is carried by a brace K, which is fixed to the standard E.

I claim as new and desire to protect by Letters Patent the following:

1. In combination with a pivotally mounted railway crossing gate, a support adjacent the gate having a socket therein, a vertically extending brace formed on the support and provided with a guide in alinement with the socket, a rotatable post extending through the guide with its lower end received in the socket, signaling elements carried by the post, and means connecting the gate and post whereby the post is rotated on the operation of the gate.

2. In combination with a pivotally mounted railway crossing gate, a horizontal support adjacent the gate and having a socket therein, a vertically extending brace formed on the horizontal support and provided with a guide in alinement with the socket, a rotatable post extending through the guide with its lower end received in the socket, an arm secured to the post and extending at right angles thereto, a vertical support on the horizontal support, a bell crank lever pivotally connected to the vertical support, means connecting the bell crank lever and gate and bell crank lever and the arm on the post whereby the post will be rotated on the operation of the gate, and signaling elements carried by the rotatable support.

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Witnesses:
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