

June 25, 1935.

T. G. STRYNATKA

2,006,120

CROSSING SIGNAL

Filed June 15, 1933

3 Sheets-Sheet 1

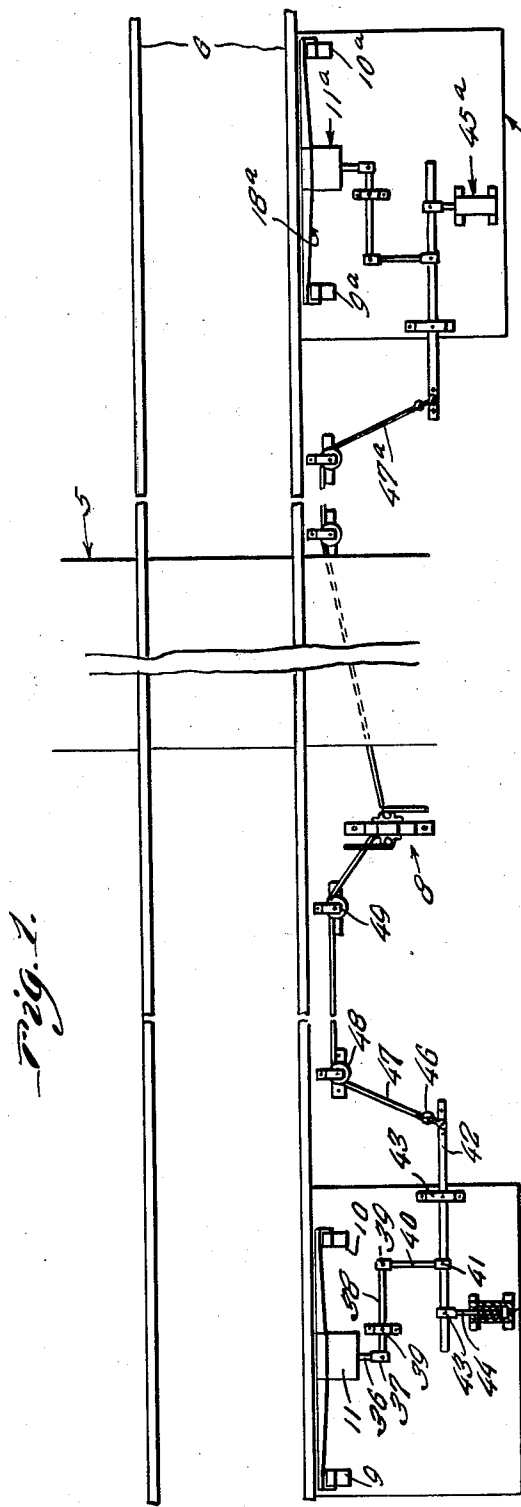


Fig. 1.

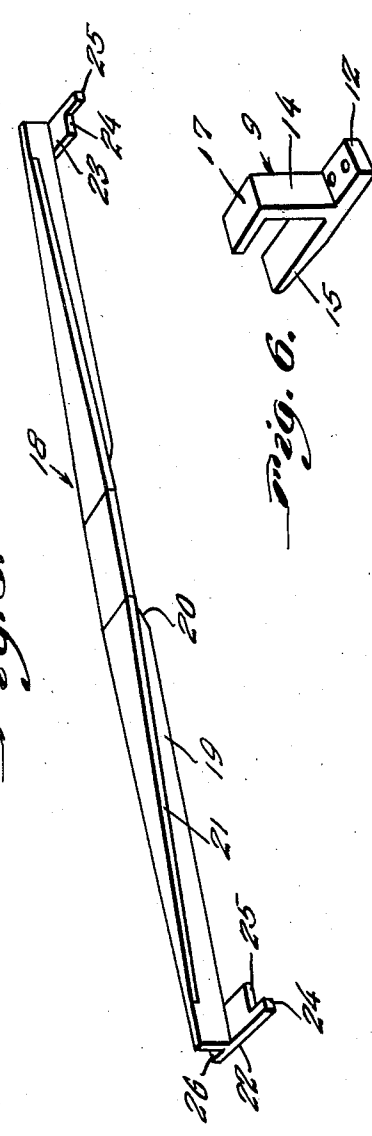


Fig. 5.

Fig. 6.

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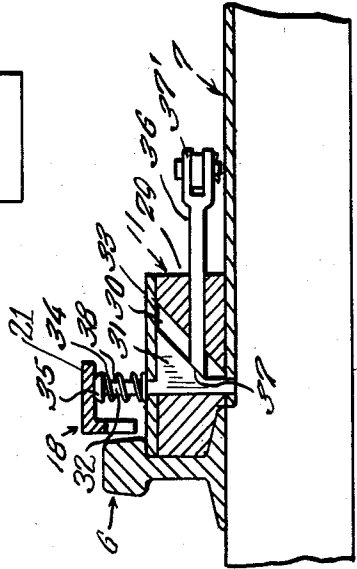
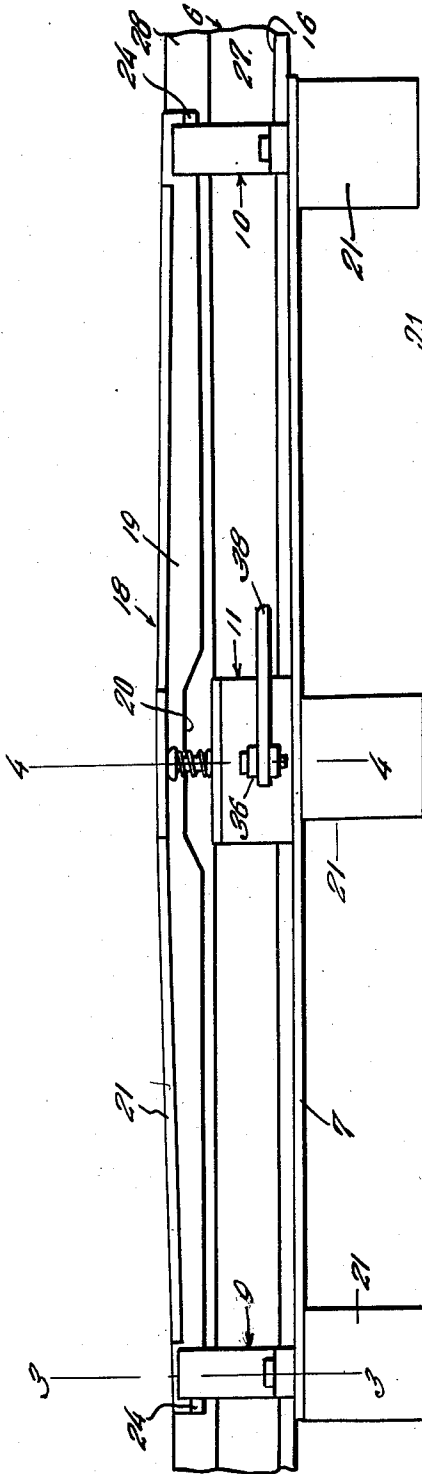
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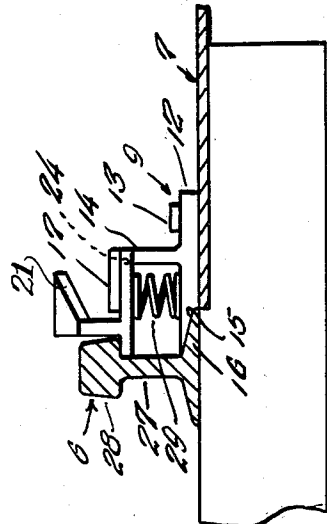
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3 Sheets-Sheet 2

*Fig. 2.*



*Fig. 4.*



*Fig. 5.*

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3 Sheets-Sheet 3

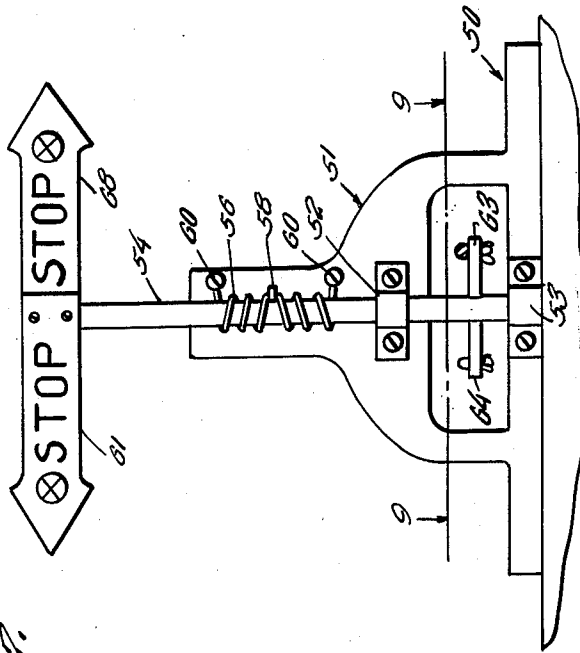
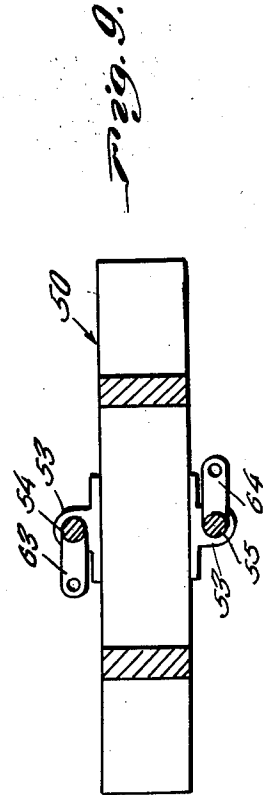
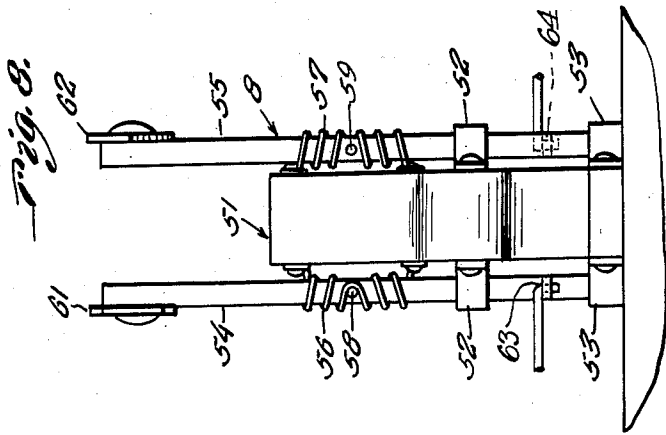


Fig. 7.

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# UNITED STATES PATENT OFFICE

2,006,120

## CROSSING SIGNAL

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Application June 15, 1933, Serial No. 675,977

6 Claims. (Cl. 246—313)

My invention relates generally to railway equipment, and particularly to grade crossing signals, and an important object of my invention is to provide an arrangement of this character which is simple and efficient, cheap to manufacture and install, and which is automatic and reliable in action.

Other objects and advantages of my invention will be apparent from a reading of the following description in connection with the drawings, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawings:—

Figure 1 is a top plan view of an embodiment of my invention.

Figure 2 is a side elevational view of a portion of the embodiment.

Figure 3 is a transverse vertical sectional view taken through Figure 2 approximately on the line 3—3.

Figure 4 is a transverse vertical sectional view taken approximately on the line 4—4 of Figure 2.

Figure 5 is a perspective view of the train operated member.

Figure 6 is a perspective view of a retaining bracket.

Figure 7 is a side elevational view of the signal mechanism.

Figure 8 is an elevational view of Figure 7 taken from the right.

Figure 9 is a horizontal sectional view taken approximately on the line 9—9 of Figure 7 and looking downwardly in the direction of the arrows.

Referring in detail to the drawings, wherein like numerals refer to like parts throughout the same, the numeral 5 refers generally to a road or grade crossing traversed by a pair of railway tracks 6. At either side of the road or crossing 5 is located a base plate 7, 7a on which is mounted the mechanism for operating the visible signal mechanism generally designated 8, only one of which is provided to be operated by the two operating mechanisms.

As the signal operating mechanisms 7, 7a are identical in construction and are located on the same side of the tracks 6, description of one will suffice to disclose the arrangement and composition of parts thereof.

The base 7 may be a metal plate or other suitable foundation affording a generally horizontal upper surface adjacent one of the rails 6. Mounted on the top of the base 7 is a longitudinally spaced pair of brackets 9, 10 and intermediate thereon a plunger casing 11. Each of the

brackets 9, 10 includes a foot 12 which is secured to the base plate 7 by a suitable bolt 13. From the upper side of the foot 12 rises an inverted L-shaped portion 14. The foot 12 is undercut as indicated at 15 to overlie and conform to the shape of the base flange 16 of the rail 6. The horizontal portion 17 of the brackets is directed toward but is spaced from the rail head 6 and is depressed therebelow as shown in Figure 3. The brackets 9, 10 are utilized for retaining in position in the proper relation to the rail 6 the train operated member or treadle generally designated 18, the form of which is shown clearly in Figure 5. The train operated member 18 comprises the vertical web portion 19, which is undercut as indicated at 20 to clear the casing 11 which this portion overlies, when the train operated member is in the depressed position. From one side of the web 19 laterally projects the treadle portion 21 which is widest near the middle of the member as shown in Figure 5 and tapers toward each end. On the lower edge of the web 19 at either end thereof there is arranged a bracket engaging plate 22, 23 which has thereon a laterally outwardly projecting finger 24 which engages outside of the brackets 9, 10, respectively, so as to maintain the treadle 18 against longitudinal movement, while permitting vertical and rocking movement thereof. The end portion 25 adjacent the finger 24 rides against the inside of the brackets, while the inward lateral extension 26 on the opposite side of the web 19 rides against the web 27 of the rail 6 and in the elevated position of the member 18 engages under the head 28 of the rail as shown in Figure 3, thereby preventing further rising of the treadle.

The tread portion of the member 18 rises from each end upwardly toward the middle, each end portion being normally on a level with the top of the rail head, and the middle portion elevated above the top of the rail head, so that the member 18 will not be fully depressed until the train wheels have rolled upon the center portion of the treadle 18.

Located between the foot 12 of each of the brackets 9, 10 and the underside of the plate portion 22 of the treadle 18 is an expanding helical spring 29 which maintains the respective ends of the member 18 and consequently the entire member 18 normally in the elevated position in which it is ready to be operated and depressed by the train wheels.

The plunger casing 11 which is located adjacent the rail 6 as shown in Figure 4 at a point on the base 7 intermediate the brackets 9, 10

comprises a block 29 which has therein a transverse triangular opening 30 in which is vertically slidable a triangular cam 31 which is formed on the lower end of a plunger 32 which works in an opening in the top plate 33. For maintaining the plunger 32 normally in an elevated position so that its head 35 engages the underside of the middle portion of the web 21 of the treadle 18, there is provided circumposed on the plunger a helical spring 34 which operates between the head 35 and the top plate 33 of the casing 11. Slidable laterally in an opening in the block 29 is a rod 36 which has an angular inner end portion 37 presented to the cam 31 in such a way that whenever the treadle 18 is depressed so as to depress the plunger 32, the cam 31 will cause the rod 36 to move outwardly, with consequences to be described.

As shown in Figures 1 and 4, the outward end of the rod 36 has a clevis 37' which has pivoted therein one end of a rocker 38 which is pivotally mounted at 39 on the base 7. The remaining end of the rocker 38 is pivotally connected as indicated at 39 to one end of a second rocker 40 whose remaining end is pivotally connected as indicated at 41 to an intermediate portion of a longer lever 42. The long lever 42 is pivotally mounted in a bracket 43 near one end of the base 7, and it is also pivotally connected as indicated at 43 near its inward end with a piston 44 which operates in a dash-pot 45 mounted on the base and whose function is to resist and delay the return of the mechanism immediately described above to initial position after the passage of a train over the treadle has operated the same. The outward end of the long lever 42 has a connection 46 for a cable 47 which is trained over suitable pulley carriers 48, 49 located at one side of the long lever and which conduct the cable 47 to the visible signal mechanism 8.

The visible signal mechanism 8 comprises a suitable elongated narrow base 50 from which rises an inverted Y-shaped standard 51. On opposite sides of the standard 51 and of the base 50 are pairs of vertically spaced journal brackets 52, 53, each pair supporting a rotatable mast 54, 55, respectively. Mounted on the upper part of the standard 51 above the brackets are coiled springs 56, 57, each of which has a portion circumposed on its respective mast 54, 55, and a loop arranged to engage a stop finger 58, 59 on the mast. The opposite ends of the springs are anchored by suitable means 60 to the side of the standard 51 at the same side of the mast in a manner to hold the targets 61, 62 normally in the positions shown in the drawings which indicate that vehicles and foot passengers may safely cross the railway tracks 6. The targets 61, 62 are arranged to point in opposite directions in parallel planes, except when one of the operating cables has broken. In the latter case the target corresponding to the broken cable will be disposed at right angles to the other target.

A lateral arm 63 is fixed to the mast 54 between the legs of the standard 51. A similar, but oppositely directed arm 64 is fixed on the mast 55. To the arm 63 is connected the end of the cable 47a, and to the arm 64 the cable 47. When the cable 47 is pulled to the left in Figure 1 as the treadle of the left hand mechanism is operated the mast 55 will be turned with its stop finger 59 engaging the loop of the spring 57 and stretch this spring until the target 62 reaches a right angular position, thereby warning foot passengers and vehicles intending to cross the

tracks, that a train is approaching the crossing from the left. Of course, the signal operating mechanisms will be located at suitable distances from opposite sides of the grade crossing 5. Operation of the right hand mechanism operates the mast 54 with its target 61 in the same way as the mast 55 and target 62, except that the swing of the target 62 is in an opposite direction. As soon as the respective cables 47 and 47a are released by the rising of the treadles after passage of the train, the springs on the masts will return the targets to initial position, slightly delayed by the retarding action of the dashpot 45.

Should either of the cables break or some other accident occur to one of the operating mechanisms, the respective one of the springs 56, 57 in unwinding to a greater extent than is permitted while the cable is intact and connected to the arm of the mast, will independently operate the related one of the targets into warning position in which the end of the target rests in the warning position against the mast of the other target. This arrangement unfailingly warns of an inoperative condition of the affected mechanism.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not desire to limit the application of the invention thereto, and any change or changes may be made in material and structure and arrangement of parts, within the spirit of the invention and the scope of the subjoined claims.

What is claimed is:—

1. The combination with a track rail, of visible signal means including a rotary member, a train operated member mounted adjacent the rail for operation by a train, cam and lever means operatively connected to the train operated member, cable means operatively connected to the cam and lever means and to the visible signal means for operating the same, helical return spring means axially aligned with said rotary member and attached thereto and to another part on the visible signal means tensioning said cable means and operative for returning the visible signal means to initial condition when said train operated member has returned toward initial position after operation.

2. The combination with a track rail, of visible signal means, a train operated member mounted adjacent the rail for operation by a train, cam and lever means operated by the operation of the train operated member, cable means connected to the cam and lever means and to the visible signal means for operating the same, return spring means on the visible signal means tensioning said cable means and operative for returning the visible signal means and said cam and lever means to initial condition when said train operated member has returned toward initial position, said spring means being arranged to place the signal means in another warning position upon breakage of the cable means.

3. The combination with a track rail having a base flange resting upon horizontal support means, of brackets having a portion of their bottom resting on said base flange and another portion of their bottom supported on said support means at one side of said rail, a treadle normally elevated above the head of said rail and having a portion engaging under the head of the rail and a second portion engaging under a part of said brackets while the treadle is in its normal elevated position, said treadle being located between said part of the brackets and

the rail, spring means expanding between the under part of said treadle and said brackets and maintaining the treadle yieldably in the normal elevated position, and signal operating means having a member under an intermediate portion of said treadle so as to be actuated when said treadle is depressed by the passage of a train over said rail.

4. In combination with a track rail, a depressible treadle supported adjacent the rail and arranged to be depressed by the passage of a train over said rail, signal operating means supported adjacent said treadle comprising a block having a vertical slot therein, a slide in said slot having a cam face, a plunger on said slide having operative engagement with said treadle so that said slide is depressed when the treadle is depressed, a horizontal rod slidable in an opening in said block substantially at right angles to said rail, said opening communicating at its inner end with said slot, said rod having its inner end bevelled to cooperate with the cam face of the slide, the outer end of said rod being arranged for operative connection to a signal.

5. The combination with a track rail having a base flange resting upon a supporting surface, a pair of brackets supported adjacent said rail on said surface, a treadle yieldably elevated between said pair of brackets and said rail, signal operating means supported on said surface adjacent said rail and treadle and between said brackets, a vertical plunger operatively engaged by said treadle, a cam on the lower part of said plunger, a horizontal rod supported so as to slide toward and away from said rail, said rod having its inner end bevelled to cooperate with the face of the cam, spring means yieldably maintaining said plunger in normally elevated position, a rocker pivoted intermediate its ends outwardly of said rail and having one end pivoted to the outer end of said horizontal rod, a second rocker pivoted intermediate its ends

outwardly of the first rocker, a link having one end pivoted to the remaining end of the first rocker and its remaining end pivoted to said second rocker between the pivotal point of said second rocker and one end of said second rocker, a dash-pot operatively connected to the last mentioned end, and signal means having an operative element connected to the remaining end of the second rocker, for operation thereby when said treadle is depressed and released.

6. In combination, a track rail, a pair of depressible treadles, said treadles being spaced and located adjacent said rail and arranged to be depressed by the passage of a train on said rail, signal means comprising a standard, a vertical mast on each of two opposite sides of said standard, each of said masts being rotatable on its vertical axis, a target on the upper end of each mast, each of said targets being sufficiently horizontally elongated to engage the mast of the other target when rotated to a certain position, a lateral arm on each mast, means operatively connecting one of said treadles with one of said lateral arms, second means operatively connecting the remaining treadle with the remaining one of said lateral arms, spring means on each of said masts and connected with the standard, said spring means tensioning said first and second operating means while the same are in their initial position so that should either of said operating means break said spring means will rotate the corresponding mast in a direction opposite to that in which said mast would normally be rotated by positive operation of said operating means by the treadles, said spring means being arranged to have tension imparted thereto when the masts are rotated by depression of the treadles, so that when said treadle is released the masts will be rotated toward their initial positions by said spring means by reason of the imparted tension therein.

THOMAS G. STRYNATKA.