E. M. JONES.

TRAIN SIGNALING DEVICE.

APPLICATION FILED JAN. 28, 1911.

1,066,910. **Patented July 8, 1913.**

2 SHEETS—SHEET 1.

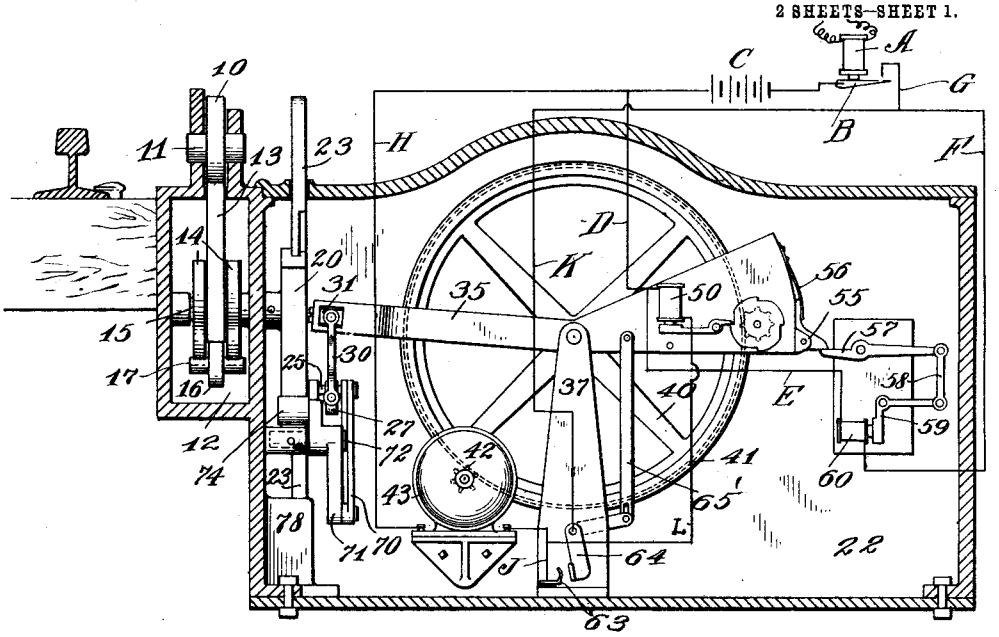


FIG. 1

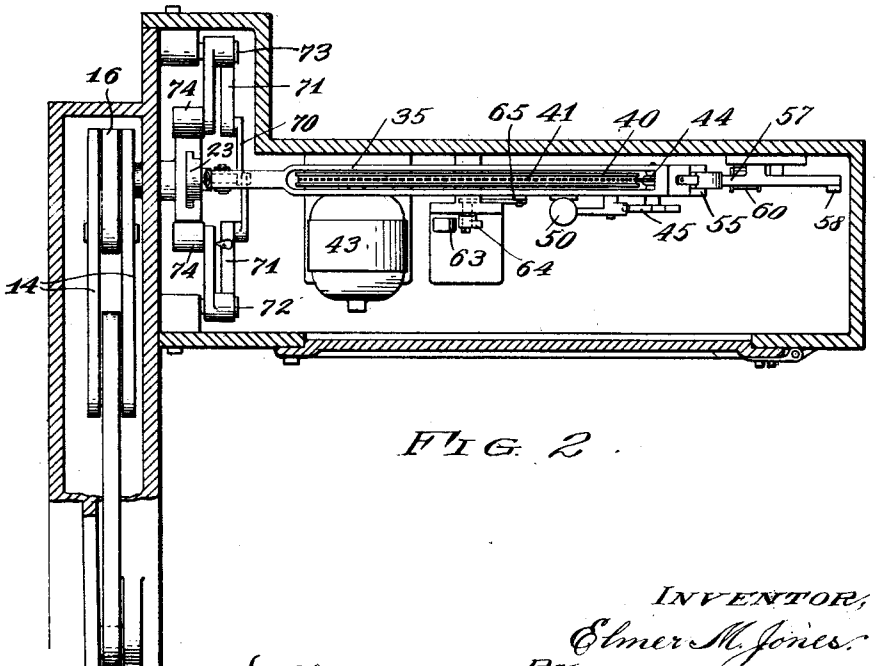


FIG. 2.

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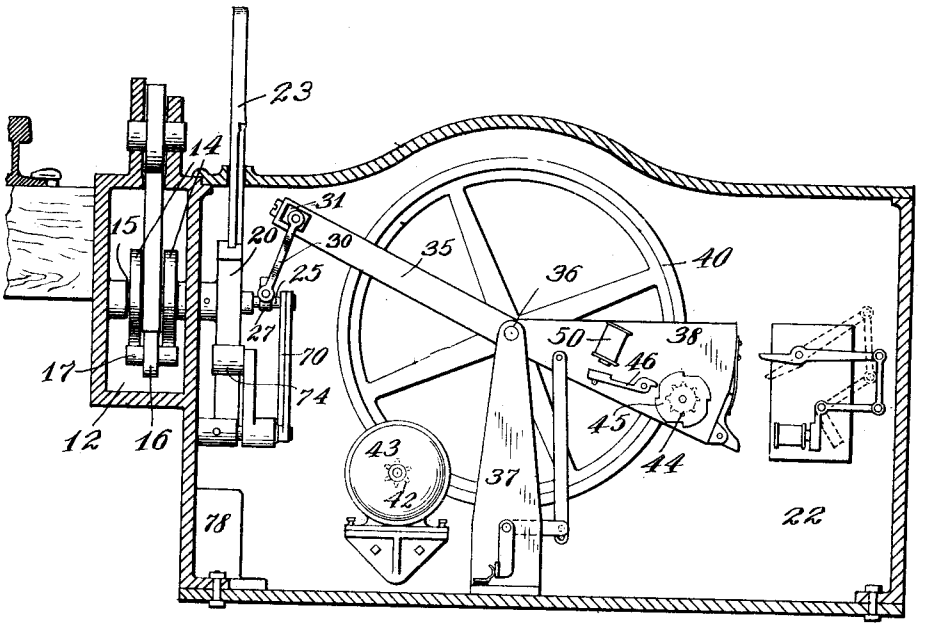


FIG. 3

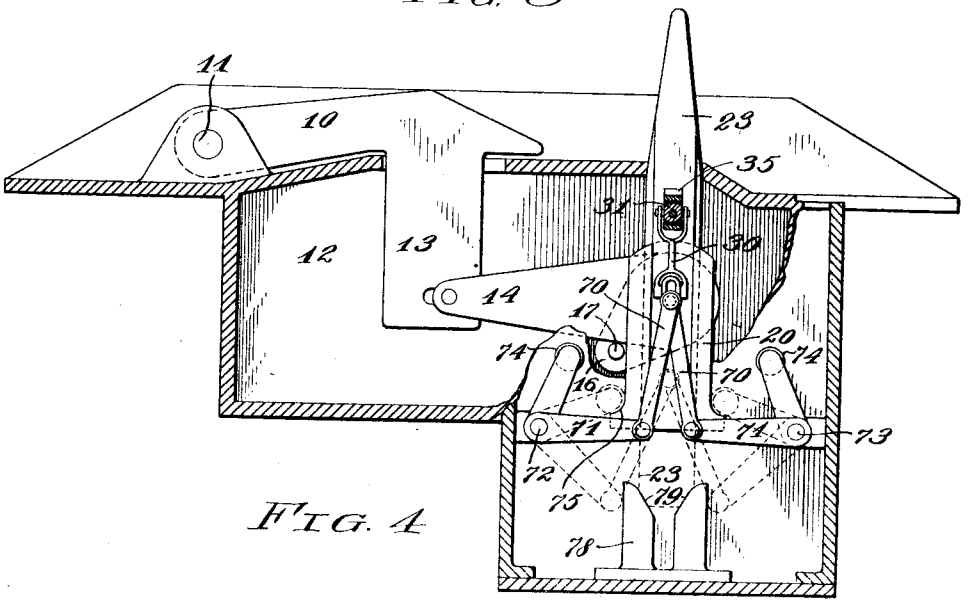


FIG. 4

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UNITED STATES PATENT OFFICE.

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TRAIN SIGNALING DEVICE.

1,066,910. Specification of Letters Patent. Patented July 8, 1913.

Application filed January 28, 1911. Serial No. 605,207.

To all whom it may concern:

Be it known that I, ELMER M. JONES, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a certain new and useful Improvement in Train Signaling Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to a railway track device designed to coöperate with a locomotive, or other moving vehicle, and to control mechanism thereon either for giving a signal, applying the brake or causing other indication. Accordingly, I have called the mechanism a train signaling device, though it is to be understood that the particular character of the signal—whether a signal proper or the direct operation of controlling mechanism—is immaterial. Such device has a movable abutment adapted to be engaged by the vehicle as it moves past the same.

The object of the present invention is to provide reliable and effective mechanism for withdrawing the abutment and maintaining it out of the path of the vehicle during safety periods, and for returning it into such path during a danger period. It is also important that the abutment should be automatically returned to active position in case of a defect in the track signaling equipment. The present invention provides such retracting and automatic returning mechanism, which form is both simple and efficient.

The invention consists of the means employed to effect these results, as hereinafter more fully explained, and as summarized in the claims.

In the drawings, Figure 1 is a vertical section through the casing containing my track device and showing the parts in normal position. This section is mostly on a plane directly behind the front door of the casing, but the pivot of the shoe which is raised by the trip lever is also shown, though it is on a plane in front of the plane of the rest of the figure; Fig. 2 is a sectional plan; Fig. 3 is a vertical section corresponding to Fig. 1, but showing the parts in danger position; Fig. 4 is a vertical section at right angles to Figs. 1 and 2, taken partly along the face of the shoe and partly in front thereof.

As shown in the drawings, 10 represents a suitable shoe or ramp pivoted at 11 to the portion 12 of the casing. This shoe has a leg 13 depending into the casing and having a pin-and-slot connection with a pair of arms 14 which straddle the leg. These arms are loosely mounted on a shaft 15. Between them and rigid on the shaft is an arm 16 carrying a pin 17 adapted to abut against the underside of the arms 14. Rigid on this shaft also is a head 20. Now, when this head is rocked, its upper portion toward the right in Fig. 4, the ramp 10 is raised; while, when the head is rocked in the opposite direction, no effect is had on the ramp, because the pin 17 simply moves idly away from engagement with the arms 14.

In my prior application No. 587,053, filed October, 1910, a construction such as above described is shown and claimed. In that construction, the member corresponding to the present head 20 is extended upwardly and forms an abutment lever adapted to be engaged by the locomotive and swung to raise the ramp. In the present construction, the head 20 slidably carries a bar 23 which has a dovetailed or tongue and groove connection with the head, as shown. This head with its bar, constitute a lever corresponding to the abutment lever of the application referred to, for when the bar 23 is elevated, it may be engaged by a locomotive and the bar and the head 20 swung as a unit to raise the ramp. The present invention, however, provides means for drawing the bar 23 downwardly along the head 20 to retract it to idle position. This mechanism will now be described.

Mounted on the face of the bar 23 within the portion 22 of the casing, is a stud 25 which, in danger position, is co-axial with the shaft 15. Around this stud 25 is a loose yoke 27 which is pivotally mounted between the two lower arms of a forked bar 30. This bar is also forked at its upper end and there straddles and is pivoted to a block 31 which has a limited swivel connection with a lever 35. This lever is pivoted at 36 between a pair of standards 37 and on the opposite side of these standards there is a weighted end 38. This weighted end is preferably made quite heavy, so that its tendency to fall elevates the other end of the lever and would maintain the abutment bar 23 elevated in the position shown in Fig. 3, if this heavy end were not held up, as it may be by latches, as shown in Fig. 1. Such latches

and the mechanism for raising the weighted end of the lever will now be described.

As shown in Fig. 2, the lever 35 is intermediately slotted and mounted on the axle 36. In this slotted portion is a wheel 40. This wheel is shown as having on its periphery a sprocket chain 41 which gears with a pinion 42 on the armature shaft of a motor 43. Mounted within the heavy end of the lever, is a pinion 44, meshing also with the sprocket chain. This pinion is rigid on its shaft, and also rigid on this shaft is a notched wheel 45 with which cooperates a latch 46 which constitutes or carries the armature of a magnet 50. Now, if the magnet 50 is energized, the latch 46 holds the wheel 45 against rotation; thereby the pinion 44 is locked to the sprocket chain 41 and the rotation of the motor armature in the proper direction will accordingly elevate the heavy end of the lever and draw down the abutment bar 23 into the position shown in Fig. 1.

When the lever is carried by the motor in the position shown in Fig. 1, a dog 55 on the lever under the influence of a spring 56 may snap across and above the end of a lever 57 which is connected by a link 58 with a bell crank 59 which constitutes or carries the armature for a magnet 60. When this magnet is energized, it holds the latch lever 57 in the position shown in Fig. 1 and may thereby sustain the weighted end of the lever 35. A deënergization of the magnets 50 and 60 releases the weighted end of the lever and allows the parts to return to the danger position, shown in Fig. 3.

The above described motor and latch mechanism is shown in connection with a semaphore in my prior application No. 561,067, filed May 13th, 1910, and is claimed therein broadly, so that reference should be made to that application for claims covering this portion of the mechanism.

Fig. 1 shows circuits which may carry the current for controlling the magnets and latches shown. In this view A represents a relay connected with any suitable track signal system. B is an armature of this relay which opens or closes the local circuit. This circuit divides into two main branches which may be traced as follows: Starting from the battery C, one of the branch circuits passes via the line D and the line E through the magnet 60, thence via the lines F and G to the armature B and thence to the battery. One part of the other branch starts from the battery C and passes via the line H to the motor and from thence via the line J to a terminal 63 of a suitable switch. From the other terminal 64 of this switch, the line K leads to the line G and thence through the armature B to the battery. The other part of this socalled second branch passes via the line D through the magnet 50 to the line L, thence to the line J, to the switch, and returns the same as the motor line. The switch member 64 is shown as carried by a bell crank which is connected by a link 65 with the lever 35 on its weighted side.

The result of the circuits shown is that when the magnet A is energized, the local circuit through the magnet 60 is closed; and the circuits through the motor and through the magnet 50 are closed if the parts are in the position shown in Fig. 3,—that is, if the weighted end of the operating lever is down and the abutment bar is elevated. Accordingly, such closure causes the motor to rotate and elevate the weighted end of the lever until its dog 55 passes above the latch 57, thereby holding the lever in the position shown in Fig. 1. As the lever is coming into this final position, the link 65 moves the switch 64 to open the circuit to the motor and magnet 50. As long as the magnet A remains energized, the parts remain in the position shown in Fig. 1 with the abutment bar retracted to idle position. When the magnet A becomes deënergized, either from the operation of the track signal system or the breaking of the circuit, which may result from the track being occupied or a broken rail, or a defect in the signal system, or otherwise,—whatever the cause may be—the deënergization of the magnet A drops the armature B, breaks the local circuits, allows the weighted end of the lever to drop, elevating the abutment bar so that it stands in the path of an advancing vehicle, and is adapted to be engaged thereby and give an indication on the vehicle.

In order that the abutment bar 23 when retracted may be held stationary in a vertical position, I provide the following mechanism:—Mounted on the stud 23 are a pair of links 70 which are connected at their lower ends with a pair of bell cranks 71, respectively pivoted at 72 and 73 to ears carried by the casing. The other arms of these bell cranks carry rollers 74 which stand opposite the sides of the head 20. Near the lower end of this head, these sides flare outwardly, as shown at 75 in Fig. 4. Now, the result of this construction is that when the pin 25 is lowered to retract the bar 23, the same movement automatically swings inwardly the rollers 74, one of which will engage the side of head 20, if the same be tipped, and bring it into vertical position. The final position of the roller 74 is shown in dotted lines in Fig. 4, this final position holding the head between the two rollers. Extending upwardly from the bottom of the casing is a recessed lug 78 which is adapted to receive the lower end of the bar 23 when it is retracted. The recess has a flaring mouth caused by the bevels 79. As the lever is being drawn downwardly, a corner of its

lower end may engage one of these bevels 79, but the continued downward movement straightens the bar so that in its lowermost position it is necessarily vertical and is rigidly embraced by the jaws 78, which thereby lock it against displacement. This prevents the lever being tampered with.

The ring 27 surrounds the pin 25 with considerable looseness, so that the action of the mechanism takes place with a considerable blow when the weighted end of the lever raises the abutment bar. This blow will break any temporary binding, such as frost or ice. By having the universal joint connection between the raising lever and the abutment bar, no harm will result if the lever should be struck before quite finishing the up stroke, such action not causing any twist, but the universal joint link adapting itself to the new position. The abutment bar it is to be understood is never high enough to be engaged by the locomotive device until the lower end of it has passed out of the locking jaws.

Having thus described my invention, what I claim is:—

1. In a mechanism of the class described, the combination of a member adapted to be moved into and out of the path of a moving vehicle, a driving member for causing the movement of the member mentioned having a rocking portion and a slidable bar, and means for moving the said bar into or out of the path of the vehicle.

2. In a mechanism of the class described, the combination of a member adapted to be moved into the path of a vehicle, a rocking member for causing such movement, a movable extension for said rocking member, and means for moving said extension into the path of a moving vehicle.

3. In a mechanism of the class described, the combination of a ramp, a rocking device for moving it, a bar slidably mounted on the rocking device, and mechanism for moving the bar with reference to the rocking device and into the path of a moving vehicle.

4. In a mechanism of the class described, the combination of a ramp, a rock shaft, an arm thereon for moving the ramp, a member for rocking the rock shaft, and a bar slidably enegaging said member and adapted to rock it.

5. In a mechanism of the class described, the combination of a ramp, a rock shaft, an arm thereon for moving the ramp, a member for rocking the rock shaft, a bar slidably engaging said member and adapted to rock it, and means for moving said bar with reference to said member to project the bar into the path of a moving vehicle.

6. In a mechanism of the class described, the combination of a ramp, a rock shaft, an arm thereon for moving the ramp, a member for rocking the rock shaft, a bar slidably engaging said member and adapted to rock it, a weight and mechanism operated thereby for moving said bar into the path of a moving vehicle, and a motor and mechanism operated thereby for withdrawing said bar from such path.

7. In a mechanism of the class described, the combination, with a member adapted to be engaged by means on a moving vehicle, a driving member adapted to be engaged by means on a moving vehicle and move the member first mentioned, means for withdrawing the driving memer from active position, and a motor for returning it to active position.

8. In a mechanism of the class described, the combination of a member adapted to be engaged by a moving vehicle, a driving member connected therewith, a weight and connecting mechanism for moving said driving member into the path of the vehicle, and means for withdrawing said driving member from such path.

9. In a mechanism of the class described, the combination of a member adapted to engage mechanism on a moving vehicle, a driving member for moving the member first mentioned and adapted to be itself engaged by the moving vehicle, a counterweighted lever connected with the driving member tending to move it into active position, and a motor and mechanism controlled thereby for moving the counterweighted lever and the driving member into inactive position.

10. In a mechanism of the class described, the combination of a member adapted to engage means on a moving vehicle, a driving member therefor adapted to be itself engaged by the moving vehicle, a weight and mechanism operated thereby for moving said driving member into the path of such vehicle, means for raising the weight to return the driving member, and a magnetic latch for holding the weight when raised.

11. In a mechanism of the class described, the combination of a signal actuating member, a driving member therefor adapted to be itself engaged by the moving vehicle, a counterweighted lever tending to move the driving member into active position, a motor and mechanism adapted to withdraw the driving member, and a magnetic latch adapted to hold the counterweighted lever in the withdrawn position.

12. In a mechanism of the class described, the combination of a signal actuating member, a driving member therefor, a counterweighted lever, mechanism connecting the same with the driving member, a motor, mechanism driven thereby, an electro-magnetically controlled connection between the same and said lever whereby the driving member may be projected into the path of the vehicle or withdrawn therefrom, and a

magnetic latch for holding said counterweighted lever in the withdrawn position.

13. In a mechanism of the class described, the combination of a ramp, a rock shaft connected therewith for moving the ramp, a bar slidably connected with the rock shaft, and mechanism for moving the bar transversely of the rock shaft into the path of a vehicle.

14. The combination of a ramp, a rock shaft, an arm connecting the same with the ramp, a head on the rock shaft, an operating bar slidably mounted in said head, and mechanism for moving said bar into the path of a vehicle.

15. The combination of a ramp, rocking mechanism for moving the same, a driving bar slidably mounted on the rocking mechanism, means for withdrawing the bar from active position, and means for rocking the bar during the withdrawal to bring it into a definite position.

16. The combination of a ramp, rocking mechanism for moving the same, a driving bar slidably mounted on the rocking mechanism, means for withdrawing the bar from active position, and means for locking the bar against movement when in its withdrawn position.

17. The combination of a ramp, rocking mechanism for moving the same, a driving bar slidably mounted on the rocking mechanism, means for withdrawing the bar from active position, and means for rocking the bar during the withdrawal to bring it into a predetermined position, and means for locking it in such predetermined position.

18. In a mechanism of the class described, the combination of a ramp, mechanism for moving the same having a rocking head, a bar slidably mounted in said head, mechanism adapted to engage the head to rock it, and a connection between said mechanism and said bar whereby the movement of the bar in the head may automatically rock the head, and means for so moving the bar.

19. In a mechanism of the class described, the combination, with a member adapted to be engaged by a moving vehicle, of rocking mechanism for moving it including a rock shaft having a head, a bar slidably mounted in said head, a bell crank adapted to engage the head, and a link connecting the bell crank with the bar.

20. In a mechanism of the class described, the combination of a ramp, rocking mechanism for moving the same having a head, a bar slidably mounted in said head, means for withdrawing the bar from active position, and a pair of jaws adapted to engage the bar in its withdrawn position.

21. In a mechanism of the class described, the combination of a ramp, a rock shaft, an arm loose on the rock shaft connected with the ramp, an arm rigid on the rock shaft and adapted to bear against the arm first mentioned, a head on the rock shaft, and an operating bar slidably mounted on said head.

22. In a mechanism of the class described, the combination, with a member adapted to be moved into the path of the vehicle, a rocking device for so moving it having a head, a bar slidably mounted in said head adapted to rock it, and mechanism for withdrawing the bar from active position, said mechanism being connected with it by a universal joint.

23. In a mechanism of the class described, the combination of means adapted to be moved into the path of the vehicle, rocking mechanism for so moving it, a bar slidably carried by the rocking mechanism, a counterweighted lever, a universal joint connecting it with the bar, and mechanism for moving the lever in opposition to its counterweight.

24. In a mechanism of the class described, the combination of a ramp, a rock shaft, an arm loose on the rock shaft and connected with the ramp, an arm rigid on the rock shaft and adapted to bear against the arm first mentioned, a head on the rock shaft, an operating bar slidably mounted in the head, a counterweighted lever, mechanism connecting the same with the operating bar, a motor adapted to move said lever in opposition to its counterweight, a magnetic latch adapted to hold the counterweight elevated, mechanism connected with the bar and adapted to automatically rock the head as the bar is moved by the motor, and means for locking the bar when in its withdrawn position.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

ELMER M. JONES.

Witnesses:
ALBERT H. BATES,
ARTHUR J. WAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."