Oct. 12, 1937. W. M. POST 2,095,616

PROTECTIVE SYSTEM FOR RAILWAYS

Filed March 4, 1937 2 Sheets-Sheet 1

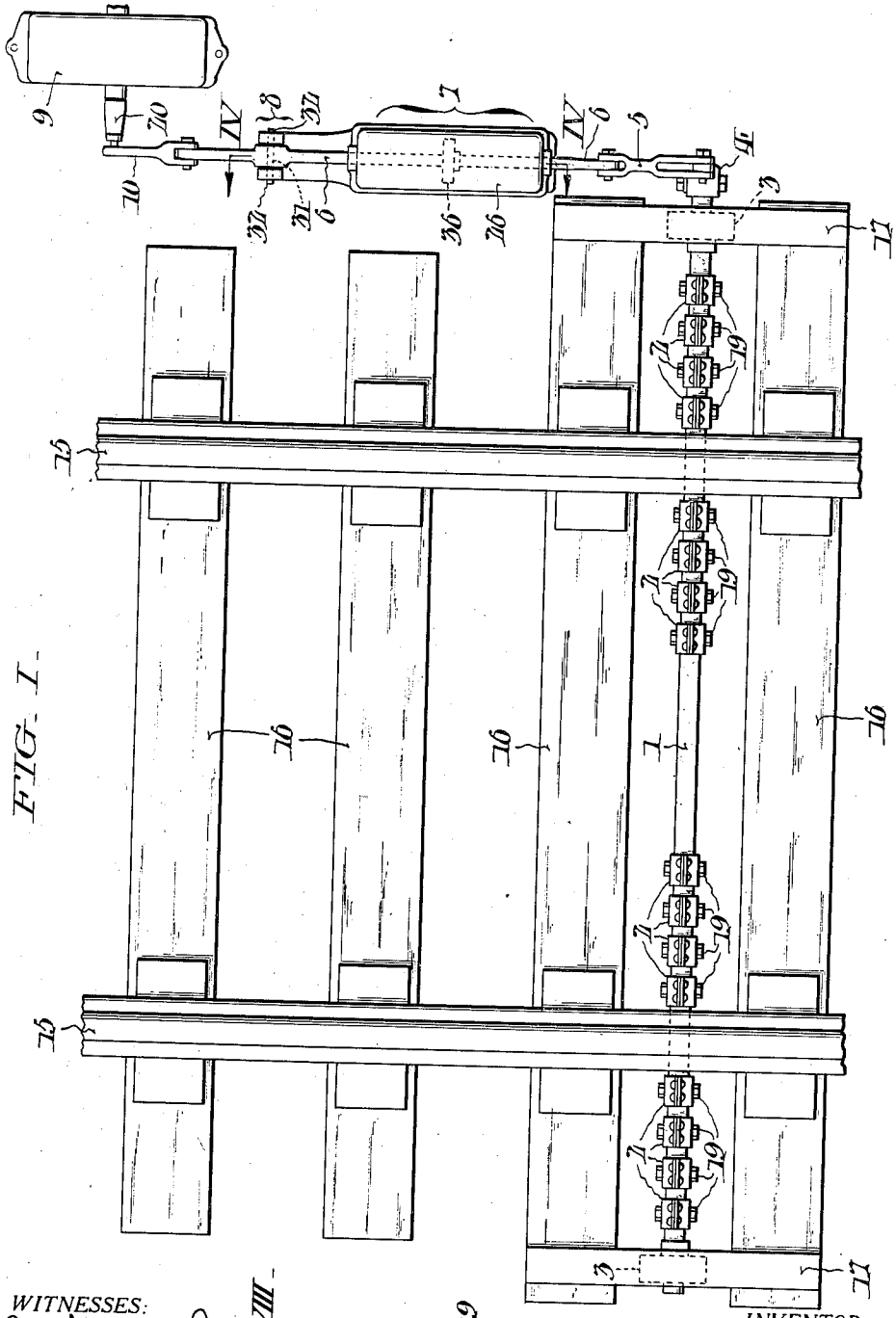


FIG. I.

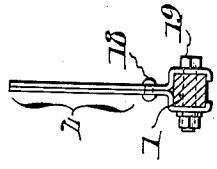


FIG. VIII.

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PROTECTIVE SYSTEM FOR RAILWAYS

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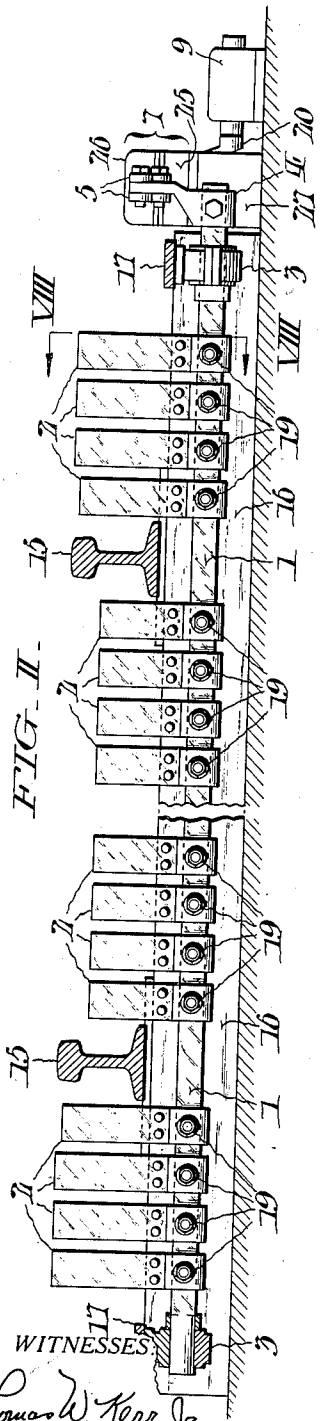


FIG. II.

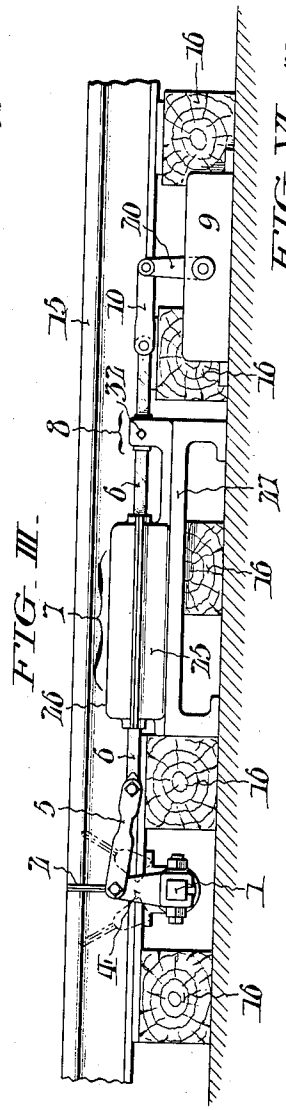


FIG. III.

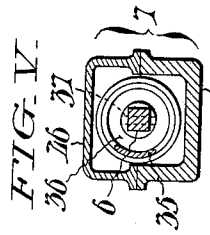


FIG. V.

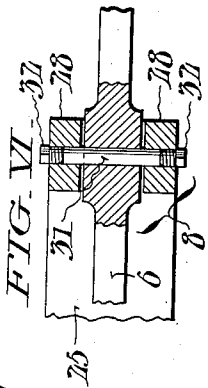


FIG. VI.

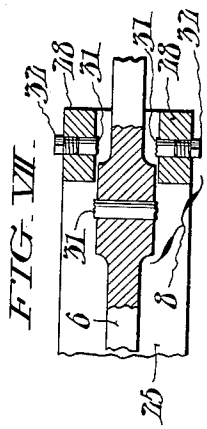


FIG. VII.

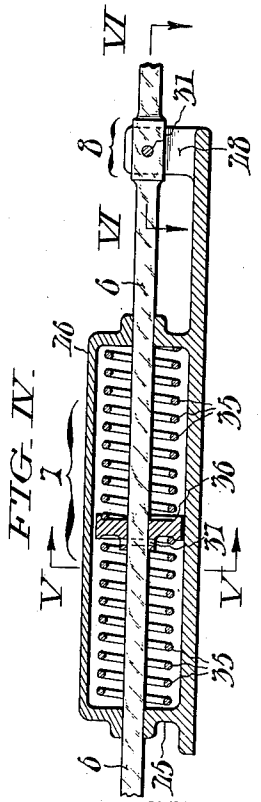


FIG. IV.

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2,095,616

UNITED STATES PATENT OFFICE

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PROTECTIVE SYSTEM FOR RAILWAYS

Welles M. Post, Wayne, Pa.

Application March 4, 1937, Serial No. 128,907

6 Claims. (Cl. 246—246)

This invention relates to protective systems for railways for the detection of broken trucks or parts hanging or dragging from passing vehicles which are likely to cause derailment. More particularly, this invention relates to the detector element in such a protective system.

A protective system of the type just mentioned is the subject matter of a United States patent issued to me December 8, 1936, No. 2,063,336, and the signal circuits and other wiring associated with the detector element proper are clearly described therein and need not be described here. The detector element of the above mentioned patented invention does not automatically restore itself for future operation after it has been actuated by dragging equipment. The main object of the invention hereinafter claimed is to provide a detector element which has the feature of automatic restoration following an actuation. One desirable feature of the non-automatic detector elements such as the one shown in the above patent, is that malicious or accidental operation is relatively unlikely because of the necessity that a strong part be broken in its operation. Hence another object of this invention is to provide an automatic detector element which is protected against malicious or accidental operation to the extent that the non-automatic devices are so protected.

Another object of this invention is the avoidance to a substantial extent of the time and expense involved in re-setting the non-automatic type of detector element. Other objects and advantages will become apparent from the following description of a specific embodiment of my invention, reference being had to the accompanying drawings.

Fig. I of the drawings shows a plan view of my invention installed in a section of railway track.

Fig. II shows a side elevation of same.

Fig. III shows an end view of same.

Fig. IV shows a section taken about the lines IV—IV of Fig. I.

Fig. V shows a section taken about the lines V—V of Fig. IV.

Fig. VI shows a section taken about the lines VI—VI of Fig. IV, showing the unbroken wooden protective pin before the device has been operated.

Fig. VII is the same as Fig. VI except that the wooden protective pin is shown broken after the device has been operated; and,

Fig. VIII shows a section taken about the lines VIII—VIII of Fig. II.

For the purposes of a detailed description, the embodiment of my invention shown in the drawings, may be resolved into the following elements: a rocker shaft 1, detector plates 2, supports 3, an operating arm 4, a connecting link 5, an operating rod 6, an automatic restoration means 7, a protective means 8, a signal switch 9, and a connecting link 10. The device is shown installed with rails 15 and ties 16.

The rocker shaft 1 has a square cross-section and is supported for rotary movement beneath the rails 15 and between the ties 16 by the support 3 positioned near the ends of the ties 16. The support 3 has an upper piece 17 which is securely attached to two adjacent ties, supporting the shaft 1 between the ties 16 and under the rails 15.

The detector plates 2 are distributively positioned the length of the shaft 1, on both sides of the rails 15 where dragging equipment is likely to be. Plates 2 are omitted from the central portion of the shaft 1 because from experience they are not necessary at this point, though they could, of course, be used there. The plates 2 are made of two pieces riveted together by rivets 18 and bolted to the shaft 1 by a bolt 19 as shown in Fig. VIII. It will be noted that the two pieces of the plate 2 embrace the square shaft 1 with the bottom edges of the plate 2 turned under the shaft 1 to make a rigid connection. The plate 2 must be strong enough and sufficiently rigidly attached to the shaft 1 to insure the rotation of the shaft 1 by a severe blow on the plate 2 from dragging equipment. Relative movement between the plates 2 and the shaft 1 must be avoided.

At one end of the shaft 1 an operating arm 4 is rigidly attached and this arm 4 is connected to the operating rod 6 by means of the connecting link 5. The operating rod 6 extends through the automatic restoration means 7 and at its other end is connected to an operating arm 20 of the signal switch 9. Both the signal switch 9 and the automatic restoration means 7 are securely anchored alongside the track.

The automatic restoration means 7 has a housing 25 with a removable upper portion 26. The lower portion of the housing 25 is formed with supports 27 for securely anchoring the housing 25 and with a pair of lugs 28 which straddle the rod 6. The lugs 28 and the rod 6 have holes which are in registry when the detector plates 2 are in the vertical position ready for actuation by a piece of dragging equipment. A wood shear pin 31 passes through these holes and is held in

place by set-screws 32 in the holes of the lugs 28, as clearly appears in Fig. VI. Of course, other materials than wood could be used for the shear pin 31 provided the pin 31 be breakable by the effective force of dragging equipment against a detector plate 2 but not breakable by lesser forces. The pin 31 must be strong enough to avoid accidental or malicious operation of the device. Fig. VII shows a pin 31 which has been broken by the operation of the device, and which must be replaced by the simple operation of removing the screws 32, removing the broken pieces, inserting a new pin 31 and replacing the screws 32.

The plates 2 are maintained in and returned to the operating position after recording a piece of dragging equipment by means of the counterbalancing springs 35 around the rod 6 and within the housing 25. There are two springs 35, one on each side of an abutment element 36 which is securely fastened to the rod 6 by a pin 37 at the midportion of the housing 25. The two springs 35 thus abut against the opposite faces of the abutment element 36 and the opposite ends of the housing 25 and oppose each other to preserve a balanced equilibrium. The abutment element 36 is disc-like in shape and is formed with peripheral flange on each face to retain the springs 35 in position.

The operation of this device is clear from the above but a brief description of a cycle of operation may be of value. When a piece of dragging equipment comes into contact with one of the detector plates 2, the rocker shaft 1 is rotated around its longitudinal axis which moves the operating arm 5. The operating arm 5 then forces the operating rod 6 to move by breaking the shear pin 31 and overcoming one of the springs 35. The operating rod 6 moves the link 10 and the operating arm of the signal switch 9 which registers the dragging equipment. The operator then restores the circuits controlled by the switch 9 for normal operation, and a new pin 31 is inserted in the manner referred to above. Because a severe blow is required to break the pin 31, the danger from malicious or accidental operation is substantially eliminated. However, the device is automatically set for further operation by one of the springs 35 which immediately returns the plates 2 to the vertical position for further operation. The protective means 8 may be restored at leisure for the detector device is otherwise fully operable as soon as the circuits have been restored for further signal registration.

Thus my invention is simple of operation and rugged of structure. It automatically restores itself for future operation immediately after actuation, and it is protected against malicious or accidental operation. The restoration of the protective feature is inexpensive and requires but a few minutes.

While I have described the above embodiment of my invention in some detail, it will be apparent to those skilled in the art that various modifications and changes may be made without departing from the spirit of my invention as hereinafter claimed.

Having thus described my invention, I claim:

1. In combination with a railway track, a detector element comprising a pivotally mounted detector plate extending transversely of said track to contact improperly hanging parts of a car passing over said track, a signal switch operated by said detector plate, an automatic restoration means for returning the detector plate to its operating position after actuation, and a protective locking means for preventing improper actuation of said detector element.

2. In combination with a railway track, a rocker shaft extending transversely of said track, a detector plate mounted on said rocker shaft to contact improperly hanging parts of a car passing over said track, a signal switch, means for transmitting motion from said rocker shaft to said signal switch, means for returning the rocker shaft and detector plate to its operating position after actuation, and a protective locking means for preventing improper actuation of said detector element.

3. In combination with a railway track, a rocker shaft extending transversely of said track, a detector plate mounted on said rocker shaft to contact improperly hanging parts of a car passing over said track, an operating arm mounted on said shaft, a signal switch, a linkage means connecting said operating arm and said switch, counterbalanced springs for maintaining said shaft and detector plate in the operating position, and a breakable protective pin for locking said shaft and detector plate in the operating position.

4. The invention of claim 3 characterized further by the fact that there is a plurality of said detector plates distributively positioned on said shaft between and outside the rails of said railway track whereby an improperly hanging part at any place under a car passing over said track will be detected.

5. In combination with a railway track, a rocker shaft pivotally supported transversely of said track, a detector plate mounted on said rocker shaft to contact improperly hanging parts of a car passing over said track, an operating arm mounted on said shaft, a signal switch having an operating arm, an operating rod connecting said operating arms, an anchored housing through which said operating rod has capacity for longitudinal movement, an abutment element secured to said operating rod within said housing, counterbalancing springs in said housing abutting against each side of said abutment element, the other ends of said springs abutting against said anchored housing, and an anchored locking means, said locking means being connected to said operating rod by a breakable shear pin.

6. In combination with a railway track, a rocker shaft pivotally supported transversely of said track, a detector plate mounted on said rocker shaft to contact improperly hanging parts of a car passing over said track, an operating arm mounted on said shaft, a signal switch having an operating arm, an operating rod connecting said operating arms by links at each end thereof, an anchored cylindrical housing through which said operating rod has capacity for longitudinal movement, an abutment element attached to said rod at the central portion of said housing, a counterbalancing spring on each side of said abutment element abutting against an end of said housing and against one face of the abutment element, and a protective locking means attached to said housing and to said rod by an easily replaceable wooden shear pin.

WELLES M. POST.