

(No Model.)

J. ORTEGA Y ESPINOSA.

DEVICE FOR INDICATING WASHOUTS IN RAILROAD BEDS.

No. 479,834.

Patented Aug. 2, 1892.

Fig. 1.

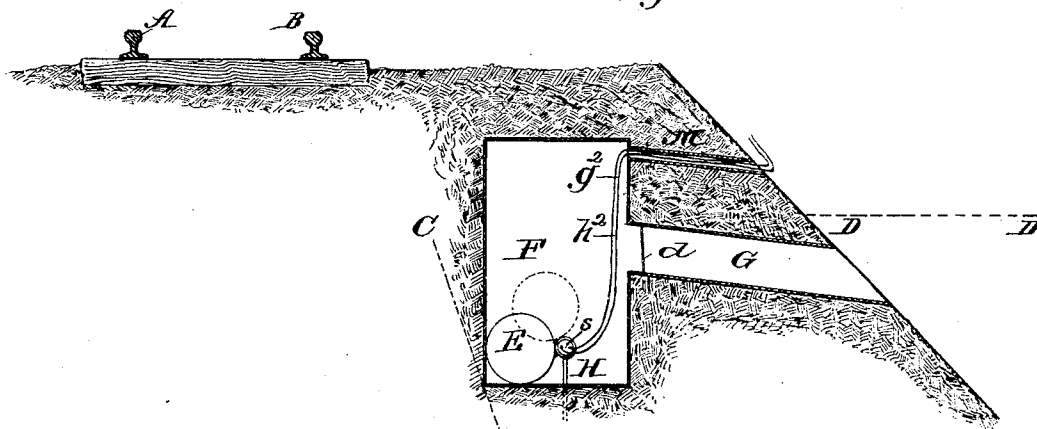


Fig. 2.

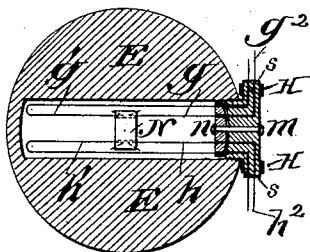


Fig. 3.

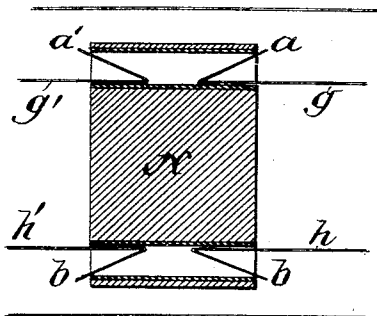
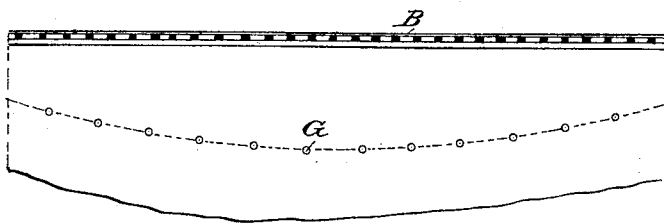


Fig. 4.



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DEVICE FOR INDICATING WASHOUTS IN RAILROAD-BEDS.

SPECIFICATION forming part of Letters Patent No. 479,834, dated August 2, 1892.

Application filed October 23, 1891. Serial No. 409,591. (No model.)

To all whom it may concern:

Be it known that I, JOSÉ ORTEGA Y ESPINOSA, of the city of Mexico, Republic of Mexico, have invented a new and Improved Device for Indicating Washouts in Railroad-Beds; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to provide a simple and effective means for electrically indicating to the stations along a railroad any danger that may exist along the road due to washouts of the road-beds or bridges; and to this end my invention consists in the peculiar construction and arrangement of the device, which I will now proceed to fully describe with reference to the drawings, in which—

Figure 1 is a transverse vertical section through an elevated portion of the road-bed, showing my apparatus embedded in the bank of earth and in its proper position. Fig. 2 is an enlarged sectional detail of the float and its contained parts. Fig. 3 is an enlarged detail view of the circuit-breaker; and Fig. 4 is a side view of a portion of the road-bed embankment, showing various water-inlets to my apparatus.

Referring to Fig. 1, A B are the rails, arranged upon ties on the road-bed at the top of an embankment, which is shown cut through transversely. In the earth or filling of this embankment and rather near the bottom there is embedded a chamber F, of wood, iron, or masonry, from which there proceed two pipes G and M, both of which open upon the inclined face of this embankment and of which G is lower down and much larger than M. These pipes dip downwardly as they pass to the outer surface of the embankment, so that rain or slight surface-drainage will not enter the chamber F. In the bottom of the chamber F there are firmly fixed two vertical standards H, provided at their tops with eyes or journal-bearings. In these are hinged the spherical float E, of wood or other suitable material, so as to turn from the position shown in full lines in Fig. 1 to the higher position indicated by dotted lines. This wooden float is bored with a diametrical hole, that ex-

tends nearly but not quite through the same, and this hole is closed and hermetically sealed by a screw-plug *n m*, having trunnioned extensions S S, which constitute journals or hinging-points within the eyes of the standards H. Contained within this screw-plug are two pairs of circuit-wires $g^2 h^2$, which emerge centrally through the trunnions or journals and extend to the stations in any suitable manner. One of these circuits terminates in the ends *g g'* and the other in the ends *h h'*, the said wires extending in position parallel to each other into the bore of the float.

N is a freely-moving circuit-breaker constructed in the form of a block with two holes through the same, (see Fig. 3,) which holes are lined with copper or other metal conductor.

The ends of the wires *g g'* approach each other somewhat closer than the width of the block N, but do not touch each other, but are doubled back on themselves to form elastic hooked ends *a a'*, and the wires *h h'* are similarly constructed.

In the normal position of the parts the block N bridges across the broken ends of the wires *g g'* and *h h'* and by the metal lining of its tubes serves to maintain the electrical circuits closed within the float, the circuit-wires $g^2 h^2$ passing through the pipe M and going to the stations.

The apparatus being adjusted in the position and relation shown in Fig. 1, the operation of the parts is as follows: In any ordinary rain the water simply flows down the side of the embankment without entering the tube G; but when from excessive rainfall or the melting of large masses of snow the water rises as a torrent and attains the level shown by the dotted lines D D, and thereby endangers the stability and integrity of the road-bed, said water flows in pipe G, and partly or wholly filling chamber F, causes the float E to rise to its dotted position. This action changes the position of the bore in said float from a horizontal to a vertical one, and the circuit-breaking block N drops down from its position and allows the terminals *g g'* and *h h'* of the two circuits to become disconnected electrically and a corresponding alarm is sounded in the stations advising the keeper

of the danger to be apprehended. When the block N drops away from its bridging position on the wire terminals, the elastic hook-shaped ends *a b* of the wires prevent it from ever getting back again to its position, so that the circuits are permanently broken. In placing the chamber F it is embedded, preferably, in such portion of the bank as is most likely to be washed away before endangering the road-bed—that is to say, it is placed outside the line C C, so that if the washing takes place and the bottom of the bank is destroyed the apparatus will in its fall from its position cause the circuit-breaking block to leave its position, and by passing either to the right or left on the wire terminals, as may happen in its fall, will cause the circuits to be broken and the alarm sounded even though no water has yet reached the chamber F.

To make my invention more effective, the chamber F may by a longitudinal canal be put into connection with a series of tubes or openings G along the bank, as shown in Fig. 4. To prevent small animals from crawling into the tube G and entering the chamber F, which might render the device inoperative, a reticulated screen or guard *d* is placed in each one of the said tubes G.

As shown, my device is designed to operate in connection with two separate circuits g^2 and h^2 to correspond to and be used with the automatic railroad-signal system which I have incorporated in a separate application for a Patent of even date herewith, Serial No. 409,929; but it is obvious that the apparatus would work equally as well with a single circuit-wire and any other system of signaling, and I therefore do not confine my invention to any special arrangement of circuits and signals.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A chamber F with inclined inlet-pipe G embedded in and opening through the side of the railroad embankment, in combination with a float arranged in the bottom of said chamber and containing a movable circuit-breaker and one or more electric circuits adapted to be broken by the change in the position of the float, substantially as shown and described.

2. The float E, having a central chamber, in combination with a tightly-fitting screw-plug *n m*, having parallel wire terminals and trunnion extensions and a circuit-breaker sliding on said parallel wire terminals and connecting the latter, substantially as shown and described.

3. The combination, with the standards H, having eyes or journal-bearings, of the float E, having a central chamber and a screw-plug *n m*, closing said chamber and having trunnion ends fitting in the eyes or journal-bearings of the standards, substantially as shown and described.

4. The sliding circuit-breaker M, having one or more holes through it provided with a metal lining, in combination with wire terminals arranged in line and having their ends bent back upon themselves to form springs and also act as stops to prevent the closing of the circuit again when once broken, as substantially shown and described.

5. The combination of the chamber F with pipes or tubes M G, standards H, arranged in the bottom of the chamber, the float E, hinged on its standards and provided with circuit-breaking devices, and circuit-wires extending through the trunnions and out through pipe M to the stations, substantially as shown and described.

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