J. J. FLYNN.

DANGER SIGNAL FOR RAILROADS.

APPLICATION FILED MAR. 2, 1911.

999,443.

Patented Aug. 1, 1911.

3 SHEETS—SHEET 1.

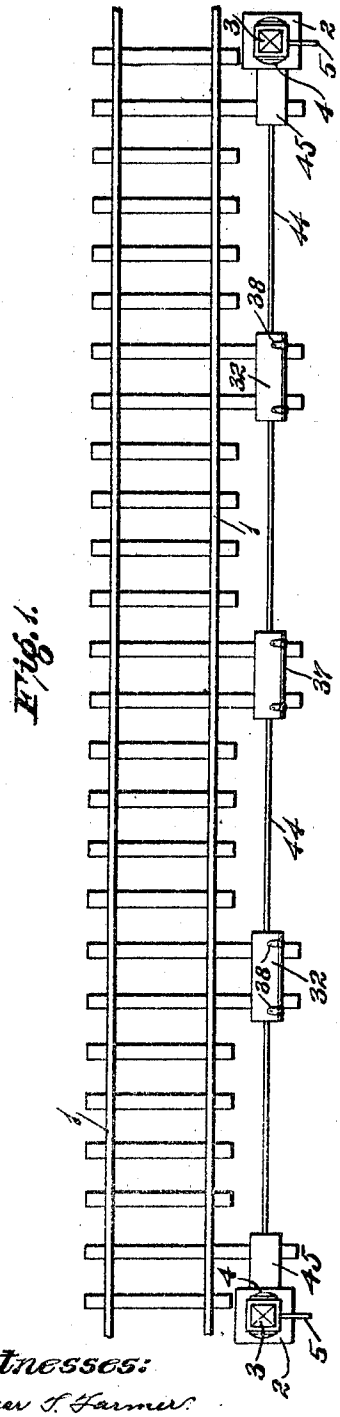

Fig. 1.

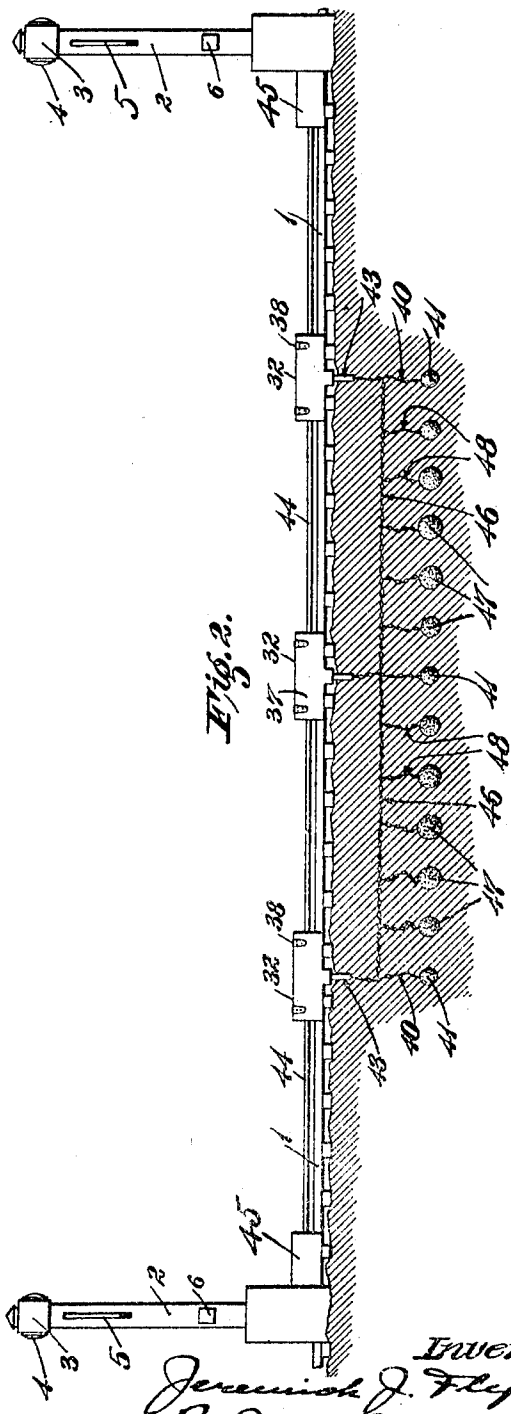

Fig. 2.

Witnesses:
Edgar S. Farmer.
G. A. Pennington.

Inventor:
Jeremiah J. Flynn,
By Cameron & Cameron, his Attys.

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3 SHEETS—SHEET 2.

Fig. 3.

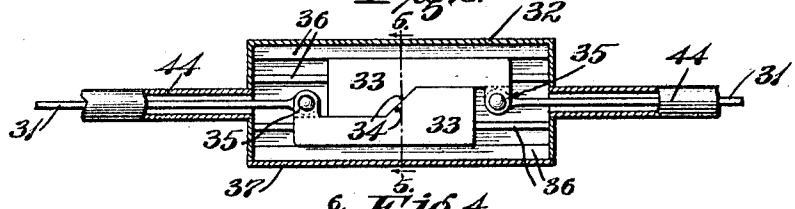


Fig. 4.

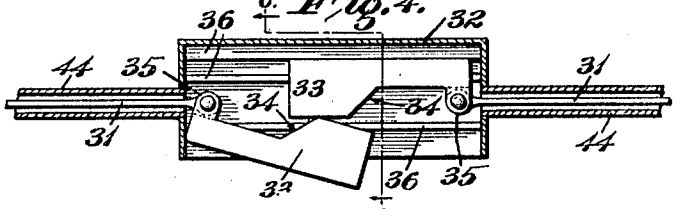


Fig. 6.

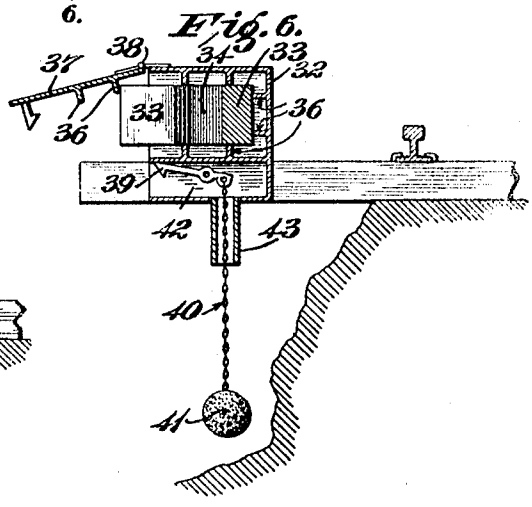


Fig. 5.

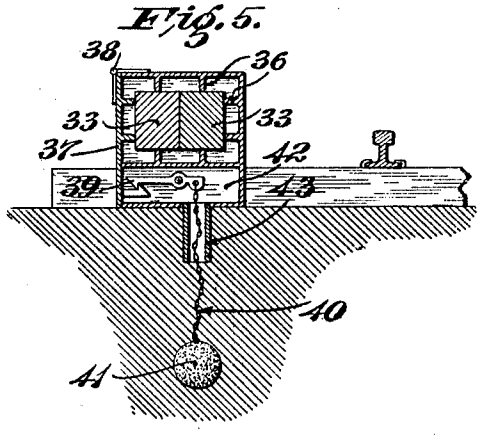
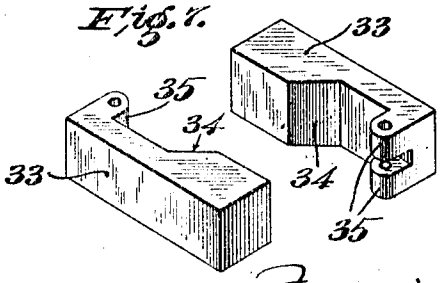


Fig. 7.



Witnesses:

Edgar T. Farmer.

G. A. Pennington.

Inventor:

Jeremiah J. Flynn,

By Dewey & Dewey, his Attys.

J. J. FLYNN.

DANGER SIGNAL FOR RAILROADS.

APPLICATION FILED MAR. 2, 1911.

999,443. Patented Aug. 1, 1911.

3 SHEETS—SHEET 3.

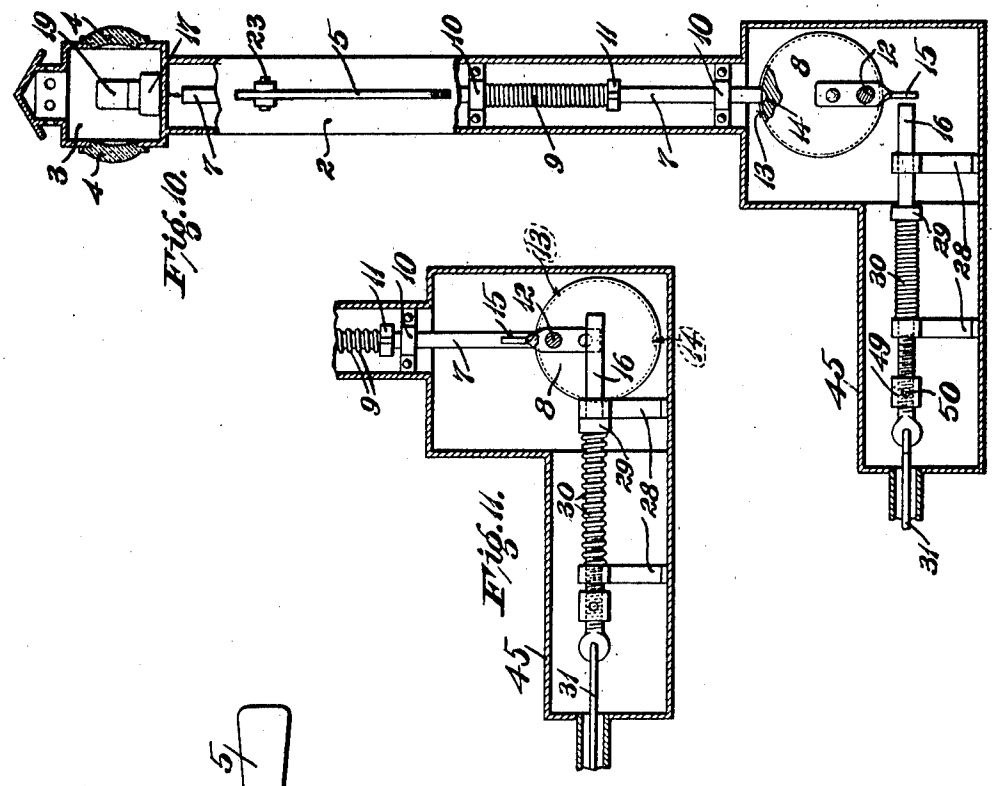


Fig. 10.

Fig. 11.

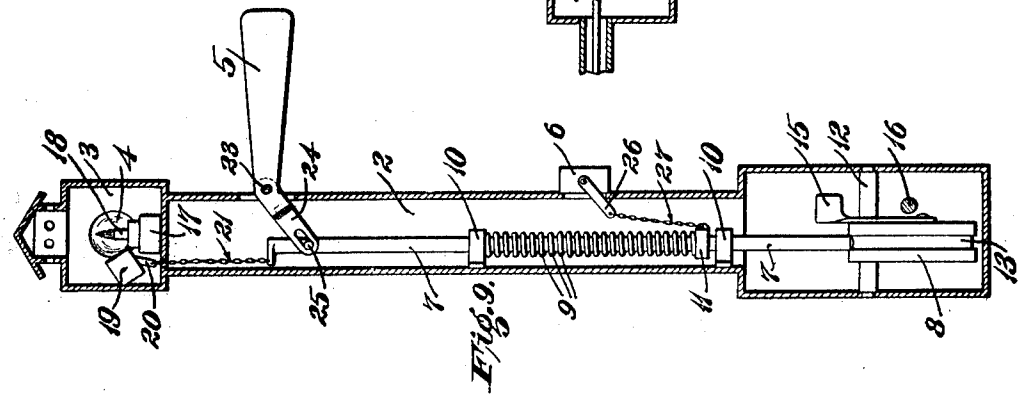


Fig. 9.

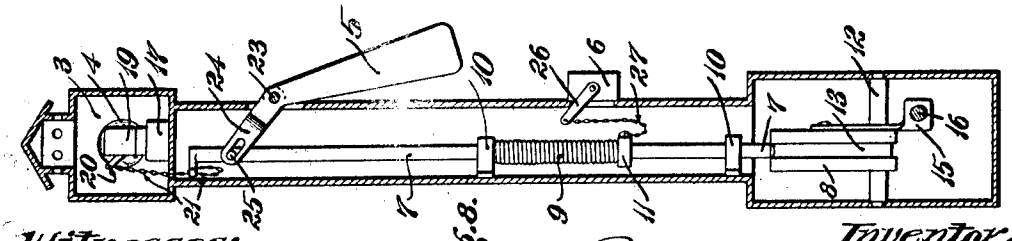


Fig. 8.

Witnesses:
Edgar T. Farmer.
G. A. Pennington

Inventor:
Jeremiah J. Flynn,
By Cornet Cann, his Attys.

UNITED STATES PATENT OFFICE.

JEREMIAH J. FLYNN, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-SIXTH TO ANDREW S. COWIE AND ONE-SIXTH TO JOHN M. GAMBON, OF ST. LOUIS, MISSOURI.

DANGER-SIGNAL FOR RAILROADS.

999,443. Specification of Letters Patent. **Patented Aug. 1, 1911.**

Application filed March 2, 1911. Serial No. 611,872.

To all whom it may concern:

Be it known that I, JEREMIAH J. FLYNN, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Danger-Signals for Railroads, of which the following is a specification.

This invention relates to danger signals for railroads and has for its principal objects to indicate washouts in roadbeds and the settling and giving way of bridges due to washouts or the destruction of bridges by fire.

The invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings which form part of this specification and wherein like symbols refer to like parts wherever they occur,—Figure 1 is a plan view of a section of railroad track and signal device associated therewith according to my invention; Fig. 2 is a side elevation of the track and signal device and a longitudinal section through the roadbed; Fig. 3 is a horizontal section through one of the boxes or housings for the rod-connecting elements, the connecting elements being shown in interlocked position; Fig. 4 is a view similar to Fig. 3, showing the rod-connecting elements disconnected; Fig. 5 is a section on the line 5—5 of Fig. 3; Fig. 6 is a section on the line 6—6 of Fig. 4; Fig. 7 is a detail perspective view of the rod-connecting elements detached; Fig. 8 is a vertical section through the signal tower or stand, showing the signal devices in normal or safety position; Fig. 9 is a view similar to Fig. 8, showing the signal devices in actuated or danger position; Fig. 10 is a view of the signal tower or stand, partly in side elevation and partly in vertical section, the line of section being taken at right angles to that of Fig. 8; and Fig. 11 is a fragmentary vertical section on the same line of section as Fig. 10, showing only the bottom portion of the tower or stand and the signal mechanism in actuated position.

Referring now, more particularly to Figs. 1 and 2 of the drawings, a section of railroad track 1 is illustrated. Located alongside or adjacent to the track, at opposite ends of a section of roadbed liable to be washed out, are two signal towers or stands 2. Mounted on each of the towers is a lamp-box 3, provided with lenses 4 arranged to show the light up and down the track; a semaphore arm 5; and an automatic telegraphic signal device 6 adapted to transmit a message to a distant point through a suitable line wire.

The several signal devices in the tower or stand 2 may be operated either electrically or, as shown, by mechanical means. Slidably mounted in the tower is a reciprocatory bar 7 whose lower end is held in contact with the periphery of an eccentric or cam-disk 8 by a spring 9 which bears at one end against one of the guides 10 for the bar and at its other end against a stop or collar 11 on the bar. The eccentric 8 is fixed on a cross-shaft or spindle 12 journaled in the lower portion of the tower or stand and it has a peripheral groove 13 in which the end of the bar 7 fits. In the groove 13, at the highest point of the cam, is a notch or depression 14 in which the end of the bar 7 is seated when the latter is in raised position, as shown in Figs. 8 and 10, and the disk is on "dead center" or, in other words, when the center of the notch 14 is vertically above the axis of the spindle 12 on which the disk is fixed. Projecting from the eccentric or cam-disk 8 at a point diametrically opposite to the peripheral notch 14 is a tappet or arm 15 which lies normally in the path of a horizontal reciprocatory actuating bar 16 so as to be struck forcibly by it, and thereby rotate the cam-disk and permit the bar 7 to be actuated downwardly in a manner hereinafter more fully set forth.

In the lamp-box 3 is a lamp 17 whose burner 18 is normally covered by a hinged box-lid 19 which is provided with an obviously arranged spring (not shown) whose tendency is to keep the lid closed. This lamp is also provided with a suitable automatic igniting device of an obvious construction and arrangement (not shown) so as to ignite the burner upon the opening of the lid; and the lid serves as a snuffer to automatically extinguish the flame when it is closed.

Extending from the hinged side of the lid 19 is a lever-arm 20 which is connected to one end of a chain 21 whose opposite end is attached to the bar 7. This chain is normally slack when the bar 7 is raised as shown in Fig. 8 to permit the lid 19 to close and is of sufficient length to pull the lid 19 open when the bar 7 is moved to its lower position, as shown in Fig. 9.

The semaphore arm 5 is pivoted, as at 23, and provided with an extension 24 which has a slot-and-pin pivotal connection with the bar 7, as at 25, so that the semaphore arm is normally in safety position and is swung up to danger position when the bar 7 is lowered.

The automatic telegraphic mechanism may be of any suitable or desirable type and contained within a box 6. An operating handle 26, such as is usually employed on all automatic telegraphic call or alarm boxes, is connected to one end of a chain 27 whose opposite end is attached to the bar 7. Thus, when the bar 7 is lowered, the lever or operating handle 26 is pulled, thereby winding and actuating the transmitting mechanism within the box. When the bar 7 is restored to normal position, the operating handle also returns to normal position.

The above mentioned horizontal reciprocatory bar 16 which coöperates with the tappet 15 on the cam-disk 8 is mounted on standards 28; and sleeved on said bar between one of the standards and a fixed collar 29 on the bar is a spring 30 adapted to move the bar against the tappet 15 and throw the high side of the cam from under the bar 7 and permit it to drop, as shown in Fig. 11. The spring-pressed horizontal bars 16 associated with the two signal towers or stands 2 are connected by a sectional rod, wire or chain 31, of such length that the bars 16 are retracted and held against the tension of the springs 30, which latter hold the sectional rod or connecting element 31 taut.

At intervals throughout the distance between the two signal stands or towers are located boxes 32; and working in these boxes are the respective coupling devices for the sectional rod or connecting element which is attached to the two horizontal signal-actuating bars 16. The coupling devices for the respective sections of the rod or connecting element 31 each comprise two counterpart interengaging or locking elements 33. These elements preferably comprise blocks which are substantially rectangular or square in transverse section and are provided with coöperating chamfered or beveled faces 34 arranged so that when pulled endwise in opposite directions, the tendency is for said blocks to separate laterally. Each of the blocks 33 is provided with inwardly projecting ears or lugs 35 so that the several sections of the connecting rod 31 may be coupled in exact alinement. Preferably, the boxes 32 are provided with longitudinal ribs 36 on the inner faces of their top, bottom and side walls.

One side of the walls 37 of the respective boxes is hinged as at 38 so as to swing outwardly, and said hinged side is normally closed by a pivoted or other suitable latch member 39. Connected to the respective latches 39 through chains or other flexible connections 40 are weights 41 which are embedded solidly in the roadbed, with the chains somewhat slack. The latches 39 are preferably incased by suitable housings 42 and the chains 40 are passed through pipes or tubes 43 depending from said housings and extending into the ground for a considerable distance to prevent tampering with the chains or latches. So, too, it is preferable to incase the several sections of the connecting rod 31 in pipes or tubes 44 extending between the respective boxes 32 and the housings 45 for the actuating bars 16. It is also preferable to connect the several chains 40 in tandem by horizontal chains 46 and attaching a series of weights 47 to said chains 46 by short chains 48. Preferably, the series of weights 47 are gradually increased in size from the respective weights 41 to the weights at the middle of the chains 46.

When the coupling elements 33 are engaged as shown in Fig. 3 of the drawings and the doors 37 of the boxes are closed and engaged by the latches as shown in Fig. 5, the sectional rod 31 is held taut by the springs 30 on the horizontal bars 16 and said bars are held in normal retracted position as shown in Fig. 10.

Should a washout occur in the roadbed at the places where the several weights are embedded or should the ground become softened so as not to sustain the weights, the weights will drop or sink and pull upon the respective chains to which they are attached and release the latch of the adjacent box 32, whereupon the door 37 is released and the pull exerted on the sectional rod 31 by the springs 30 will cause the two coupling members 33 to separate as shown in Fig. 4 and thereby breaking the continuity of the rod 31 and permitting the two horizontal bars 16 to move forcibly into contact with the tappets 15 on the respective cam-disks 8. It is, of course, understood that the several boxes 32 are of sufficient lengths to permit the coupled members 33 to slide intact therein and permit the two divisions of the rod 31 to move in opposite directions. The sudden releasing of the particular coupling members 33 and forcible impact of the bars 16 against the tappets 15 on the cam-disks 8, throws said cam-disks so that the bars 7 are actuated by their springs and the several signal devices in the tower or stands 2 are actuated to danger position.

To restore the connecting rod 31 and bars 16 to normal position it is preferable to screw-thread the bar 16 near its inner end and place a nut 49 thereon and provide the same with a hole 50 to receive a spanner wrench. By this arrangement the nut may be turned on the bar 16 and impinged

against the standard 28 so as to draw the bar 16 against the tension of its spring 30. The coupling of the several rod sections 31 may be then easily effected and the doors 37 of the several boxes 32 closed and locked. After the coupling of the rod sections is effected the nut 49 is unscrewed to the position shown in Fig. 10 and the sectional rod 31 is then held taut by the springs 30. The cam-disk may then be restored to the position shown in Figs. 8 and 10 and the signal devices are thereby restored to normal position.

While the device is shown in connection with the roadbed, obviously, the boxes 32 may be placed on a bridge and the weights arranged on a suitable support so as to effect the uncoupling of the rod sections 31 upon the giving away or settling of the bridge due to washouts or destruction by fire. It is also obvious that the device admits of considerable modification without departing from my invention. Therefore, I do not wish to be limited to the specific construction and arrangement shown.

What I claim is:

1. A danger signal for railroads comprising a signal stand located adjacent to the track, an operating device for the signal associated with the stand, said operating device being held in normal inactive position by a sectional connecting element extending lengthwise of the track in proximity thereto, means for connecting the respective sections of said connecting element, and means for disconnecting said connecting element upon the giving way of the roadbed.

2. A danger signal for railroads comprising two signal stands located respectively at opposite ends of a section of track and in proximity to said track, an operating device associated with each of said stands for actuating the respective signals, a sectional connecting element secured at its opposite ends to the respective signal-operating devices and adapted to hold them in normal inactive position, releasable coupling elements connecting the respective sections of the connecting element, and means for disconnecting said coupling elements upon the giving way of the roadbed.

3. A danger signal for railroads comprising a signal stand located in proximity to the track, a spring-pressed device associated with the stand for effecting the actuation of the signal, means for normally holding said spring-pressed device retracted, said means comprising a sectional connecting element extending lengthwise of the track in proximity thereto, the respective sections of said connecting element being coupled together by interengaging coupling elements adapted to separate when a pull is exerted lengthwise of said sectional connecting elements, releasable means for normally holding said coupling elements against separation, and a device arranged to effect the release of said coupling elements upon the giving way of the roadbed.

4. A danger signal for railroads comprising two signal stands located respectively at opposite ends of a section of track and in proximity to said track, a spring-pressed device associated with each of said signal stands and adapted to effect the actuation of the signals, means for normally holding said spring-pressed devices in retracted position, said means comprising a sectional connecting element extending lengthwise of the track in proximity thereto, coupling elements for the respective sections of said connecting element, said coupling elements being arranged in counterpart pairs and having opposed cam faces adapted to effect the separation of said coupling elements when the sections of the connecting elements are pulled lengthwise in opposite directions, a releasable device for normally holding said coupling elements against separation, and a device arranged to effect the release of said coupling elements upon the giving way of the roadbed.

5. A danger signal for railroads comprising a signal stand, a signal device mounted on said stand, a vertical reciprocatory element mounted on said stand and connected to said signal device so as to actuate the same, a cam-disk adapted to normally support said reciprocatory element in raised position, a tappet on said cam-disk, a spring-pressed element adapted to move forcibly against said tappet to actuate said cam-disk and effect the lowering of said reciprocatory element, and means for normally holding said spring-pressed actuating element in retracted position, said means comprising a normally taut sectional element whose adjoining sections are respectively connected by a coupling device comprising a pair of interengaging elements adapted to separate when a pull is exerted on said connecting element, releasable means for normally holding said coupling elements intact, and a weight supported in fixed position on the roadbed and connected to said releasable means so as to effect the release of the coupling elements upon the giving way of the roadbed.

6. A danger signal for railroads comprising two signal stands located respectively at opposite ends of a section of track and in proximity to said track, a spring-pressed device associated with each of said signal stands and adapted to effect the actuation of the signals, means for normally holding said spring-pressed devices in retracted position, said means comprising a sectional connecting element secured at its opposite ends to the respective spring-pressed signal-actuating devices and extending lengthwise

of the track in proximity thereto, the adjoining sections of said connecting element being respectively connected by a pair of interengaging coupling elements adapted to separate when said sectional connecting element is pulled, releasable means for normally holding said coupling elements intact, and weights normally supported in fixed position on the roadbed and connected to the respective releasable holding devices for said coupling elements, whereby the coupling elements are disconnected upon the giving way of the roadbed.

7. A danger signal for railroads comprising a signal device, an operating device for the signal, said operating device being held in normal inactive position by a continuous sectional element, releasable means for connecting the adjoining sections of said continuous sectional element, and means for disconnecting the respective sections of said continuous sectional element upon the giving way of the roadbed.

8. A danger signal for railroads comprising a signal device, an operating device for the signal, said operating device being held in normal inactive position by a continuous sectional element extending throughout the length of a section of track, releasable means for connecting the adjoining sections of said continuous sectional element, and weights supported by the roadbed and connected to said releasable means so that the sections of said continuous sectional element are disconnected upon the giving way of the roadbed.

Signed at St. Louis, Missouri, this 27th day of February, 1911.

JEREMIAH J. FLYNN.

Witnesses:

G. A. PENNINGTON.

M. A. SHELTON.