

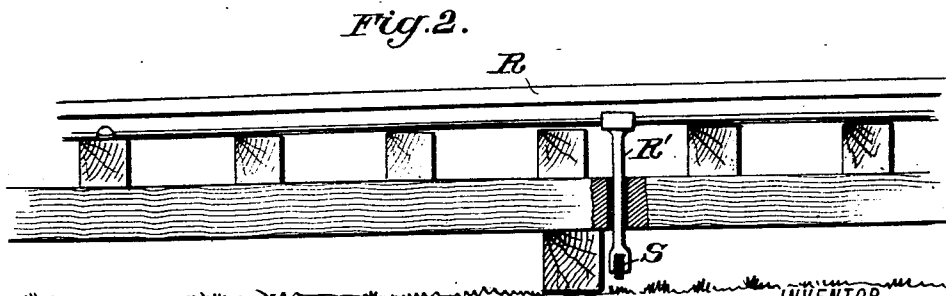
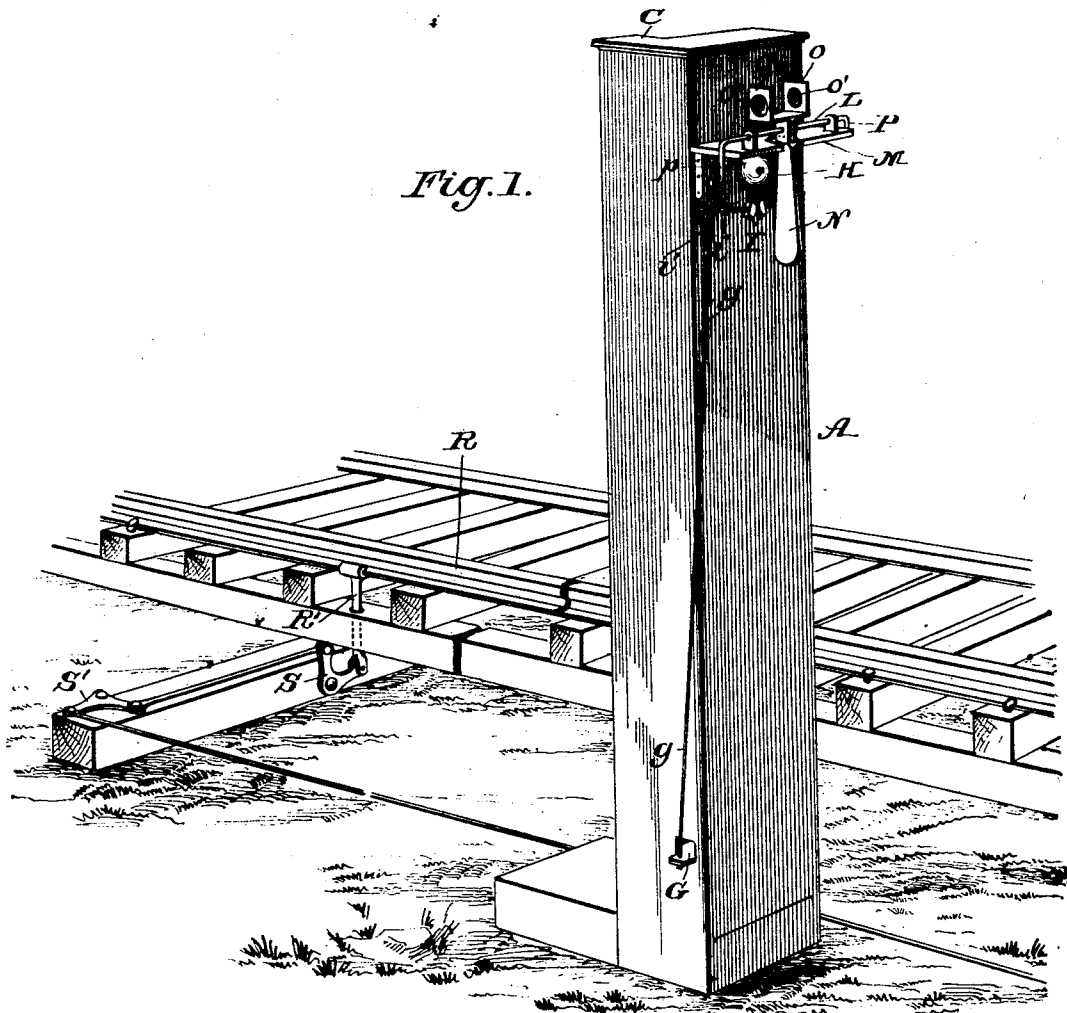
(No Model.)

2 Sheets—Sheet 1.

W. S. WOODS.
RAILROAD CROSSING SIGNAL.

No. 586,471.

Patented July 13, 1897.



WITNESSES:
Jos. A. Ryan
P. B. Turpin.

INVENTOR
William S. Woods
BY *Munn & Co.*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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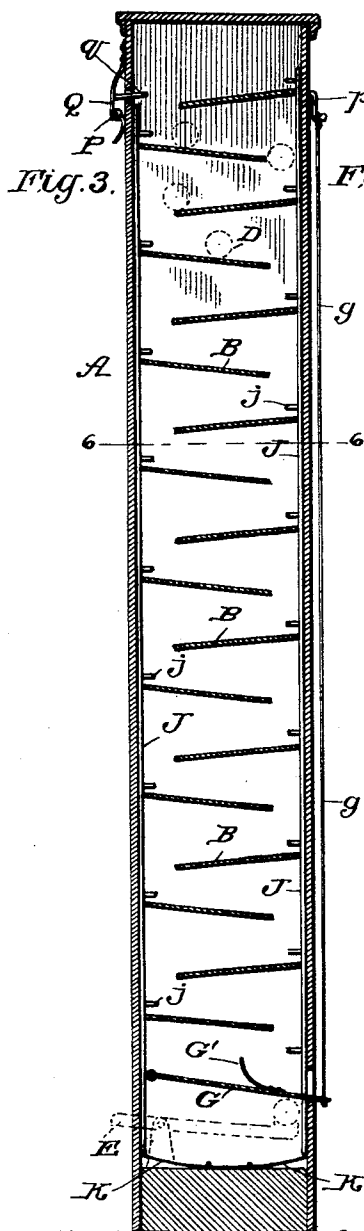


Fig. 3.

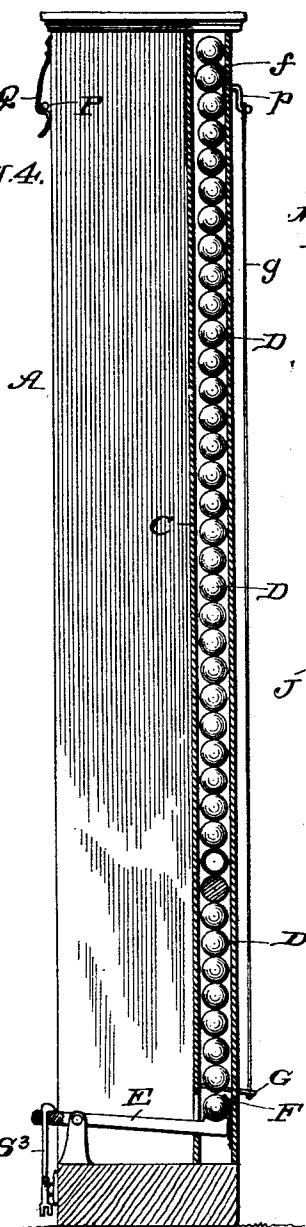


Fig. 4.

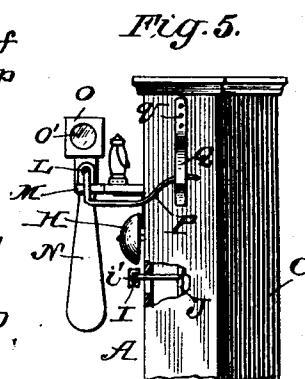


Fig. 5.

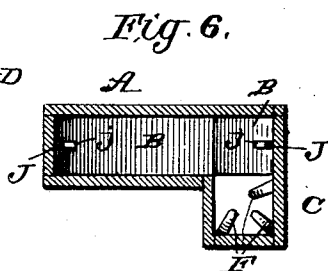


Fig. 6.

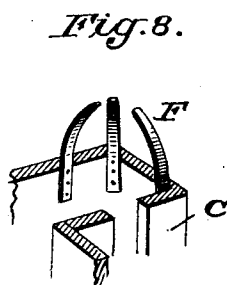


Fig. 8.

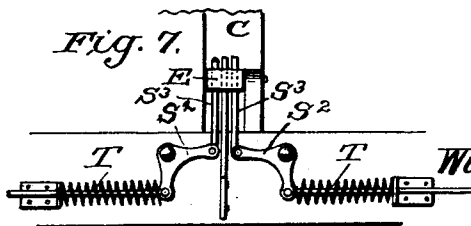


Fig. 7.

WITNESSES:
Jos. A. Ryan
P. B. Durpin

INVENTOR
William S. Woods.
BY *Munn & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM S. WOODS, OF SULPHUR SPRINGS, INDIANA.

RAILROAD-CROSSING SIGNAL.

SPECIFICATION forming part of Letters Patent No. 586,471, dated July 13, 1897.

Application filed March 27, 1897. Serial No. 629,523. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. WOODS, residing at Sulphur Springs, in the county of Henry and State of Indiana, have invented a new and useful Improvement in Railroad-Crossing Signals, of which the following is a specification.

My invention is an improvement in signals for railroad-crossings, and has for its object to provide a simple economical construction which will operate efficiently in all weathers and will give the signal with certainty on the approach of a train; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a signal constructed according to my invention. Fig. 2 is a detail side elevation, part in section, of a portion of the track. Fig. 3 is a vertical longitudinal section on about line 3 3, Fig. 1. Fig. 4 is an elevation, part in section, of the signal-box. Fig. 5 is a detail side view of the upper portion of the signal-box. Fig. 6 is a cross-sectional view on about line 6 6, Fig. 3. Fig. 7 is a detail side view showing the connection between the tripping devices and the lever for elevating the balls, and Fig. 8 is a detail view.

In carrying out my invention I seek to provide means whereby the descent of a ball or balls in a suitable ballway will sound the signal. I also provide means whereby such ball as it descends will cause the visual signal to be exposed, thus furnishing both a visual and an audible signal. The signal-box A has a suitable frame or casing and is provided with a ballway down which the balls roll and with signal devices having portions projecting adjacent to the ballway in position to be operated as the ball descends. In carrying out this feature of my invention I form the ballway with a series of consecutive cross-partitions or baffle-plates B, inclined reversely and extending from one side of the case nearly to the other and arranged at their lower ends to discharge upon the upper end of the next lower plate. By extending the signal-box vertically and increasing or decreasing the number of baffle-plates the length of time during which the signal may be sounded may be increased or decreased as

desired. Adjacent to the ballway I provide a ball-holding chamber C, arranged to contain a column of balls D, which rest at their lower ends on a suitable elevating device, preferably a lever E, as shown. At its upper end the ball-holding chamber is arranged to discharge into the upper end of the ballway, and at the lower end of the ballway it discharges into the lower end of the ball-holding chamber, so the balls are used in a circuit, being forced up the ball-holding chamber, discharged one at a time into the upper end of the ballway, pass down the latter, and are resupplied to the ball-holding chamber at the lower end thereof.

From the foregoing it will be seen that each operation of the lever E lifts the column of balls one step, the lever then falling to position to receive another ball. To hold the elevated balls up, I provide a detent F, which may consist, as shown, of several spring-tongues, which permit the balls to be forced upward by the lever, but prevent their falling back when the lever moves back to position for another operation. I also provide a detent device *f* at the upper end of the ball-holding chamber to prevent the balls from passing out too freely, as it might happen in operation that the lever would throw the column of balls up with such force as to discharge more than one ball at each operation. For this reason I prefer to use the detent *f*, which serves as a check and limits the number of balls discharged at each operation of the device.

In the lower end of the signal-box I arrange a tilting bar G, on the swinging end of which the ball falls just before it passes into the ball-holding chamber. This bar has on its upper side a stop G', which prevents the ball from rolling up the bar G. This tilting bar serves to readjust the visual signal in the manner more fully described hereinafter.

The audible signal is shown as a bell H, arranged to be struck by hammers I, pivoted between their ends at *i* and connected or engaged at *i'* with a vertically-sliding rod J, which has, within the signal-box, projections *j*, arranged between the lower discharge ends of each baffle-plate and the upper end of the baffle-plate next below, so the ball as it falls from one baffle-plate onto the other will strike

upon the projection *g*, depress the rod J, and sound the bell, producing a series of rings as the ball travels the ballway. I have shown the bell with two hammers and provide two slide-rods J, one at each side of the signal-box; but manifestly good results would be secured with the use of one slide-rod J. The slide-rods J rest at their lower ends on springs K, which press them upward and serve to hold them normally elevated and yet permit their operation by the descending balls, as will be understood from Fig. 3.

The visual signal is shown as having a rock-shaft L journaled adjacent to a shelf M, on which a lamp or lantern may be placed. On this shaft are secured the semaphore or signal arm N and the light-frames O, which have the panes O' of red glass. When the visual signal is exposed, the signal-arm N swings horizontally outward and the frames O turn inward on opposite sides of a lamp or lantern placed on the shelf M. I weight the rock-shaft so it will normally turn to position to expose the visual signals, and to hold it in such position I provide it with a crank-arm P, which swings into engagement with a detent Q, having a projection *q*, arranged in position to be struck by the descending ball, preferably just as the latter reaches the lower end of the first baffle-plate, as shown in Fig. 3. As the ball descends it will strike projection *q*, release the detent, and permit the visual signal to swing into exposed position, where it will remain until the ball depresses the tilting bar G, which is connected by a rod *g* with a crank *p* on the rock-shaft L, arranged in such manner as to readjust the said shaft to the position shown in Fig. 1.

The lever E may be operated in any suitable manner by an approaching train. For such purpose I have shown the track with an elevated portion R, which may be depressed by the passing train and will operate by the connection R' to tilt a bell-crank lever S, which connects with intermediate bell-crank levers S' and S², the latter being connected with the lever E by a slide-rod S³. This slide-rod as shown in Fig. 4 is preferred because it may be operated to tilt the lever E and yet will not be moved by the operation of such lever by another slide-rod when a double connection is made with the lever E, as shown in Fig. 7. Springs T serve to take up slack in the connections between the bell-crank levers, as will be understood from Fig. 7.

In the operation of my signal on double-track railroads the balls are all made heavy, so each one will operate the signaling devices, because the trains always approach the crossing from the same directions on the same tracks; but on single-track railroads, where the trains approach the crossing from both directions on the same track, they would operate the signals both on approaching and after leaving the crossing if all the balls were heavy. Therefore on such single-track railroads I provide alternate light and heavy

balls, so the train approaching the crossing will throw a heavy ball into the ballway to operate the signal, but will as it leaves the crossing throw a light ball into the ballway, which will pass down without operating the signal.

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

1. A signal comprising a main frame or casing having a ballway, a signal and devices connected therewith and projecting adjacent to the ballway whereby to be operated by a ball as it descends therein, substantially as described.

2. A signal comprising a ballway, a ball or balls to descend therein, a signal, and devices whereby the signal will be operated by the descent of a ball within the ballway substantially as described.

3. In a signal a main frame or casing having a consecutive series of inclined cross-partitions or baffle-plates forming a ballway and devices connected with the signal and projecting into said way, adjacent to said partitions or baffle-plates, whereby to be operated by the ball descending therein, substantially as described.

4. In a signal, a casing, a main frame having a ballway through which the balls may descend and a ball-holding chamber in which a column of balls may be held, the upper end of such chamber discharging into the ballway substantially as described.

5. In a signal, the combination of the ballway, the ball-holding chamber communicating at its upper and lower end with the ballway and means for lifting said column of balls by which to discharge the uppermost one into the ballway, substantially as described.

6. An apparatus substantially as described, comprising a main frame or casing having a ballway and a ball-holding chamber, and a signal having a device projecting into the said ballway for operation by the ball descending therein, substantially as described.

7. An apparatus substantially as described, comprising a main frame, a casing having a ballway, an audible signal, a visual signal and devices whereby the descent of balls in the ballway will operate both signals, substantially as shown and described.

8. An apparatus substantially as described, comprising a main frame or casing having a ballway, a ball-chamber and alternate light and heavy balls in said chamber, the signal and means by which the heavy balls will in their descent operate the signals, substantially as described.

9. An apparatus substantially as described, comprising the main frame or casing having the reversely-inclined cross-partitions or baffle-plates projecting from its opposite ends and discharging at their lower ends onto the upper end of the next lower plate, the signal and devices connected with the signal and

projecting into the path of the balls descending on said plates or partitions, substantially as described.

10. In an apparatus substantially as described, the combination of the main frame or casing having the ballway, the signal, a slide-rod arranged to operate said signal and devices spaced apart on said rod and arranged for operation at intervals by the ball as the latter descends in the ballway, substantially as described.

11. In an apparatus substantially as described, the combination of the main frame or casing having a ballway, the slide-rod having a plurality of projections arranged for engagement by the balls descending in said ballway the bell and the bell-hammer arranged for operation by said slide-rod, substantially as shown and described.

12. An apparatus substantially as described, comprising the casing having the ballway, the ball-holding chamber discharging at its upper end into said ballway, a lever arranged at one end beneath the ball-holding chamber, and adapted to elevate the column of balls therein and means whereby said lever may be operated, substantially as described and shown.

13. The combination in an apparatus substantially as described, of the frame or casing having a ballway and a ball-holding chamber adapted to contain a column of balls and arranged to discharge into said ballway, the elevating device for lifting the said column of balls and the detent above said device for permitting the passage of the ball resting on said device and for holding the column of balls elevated when lifted, substantially as described.

14. In an apparatus substantially as described the combination of the visual signal, the rock-shaft supporting such signal and having a crank-arm, a rocking bar connected with said crank-arm and arranged to be operated by a descending ball, and a ball-operated detent for said rock-shaft substantially as described.

15. An apparatus substantially as described, comprising the casing having a main portion and a lateral offset forming a ball-holding chamber, discharging at its upper end into the main portion, the baffle-plates in the main portion, the lever operating in the lower por-

tion of the ball-holding chamber, the signal and the signal-operating devices, projecting into the casing in position for operation by the balls, substantially as described.

16. An apparatus substantially as described, comprising the casing the slide-rods having projections extending in the casing the reversely-inclined partitions or baffle-plates, the springs bearing beneath the slide-rods, the balls and means for supplying the balls, substantially as described.

17. In an apparatus substantially as described, the combination of the main frame or casing the signal rock-shaft having a crank at one end for engaging the detent and a crank at its opposite end for connection with the readjusting-bar, the plates or partitions in the casing forming a ballway, the tilting bar at the bottom of said casing, connections between said bar and the crank of the rock-shaft and means for discharging the balls into the ballway, substantially as described.

18. An apparatus substantially as described, comprising the main frame or casing having the ballway, the ball-supporting chamber, the ball-elevating lever, the signal devices arranged for operation by the descending balls, and the trip devices, arranged for operation by the passing train and connected with the ball-elevating lever, substantially as described.

19. An apparatus substantially as described comprising a ballway having a series of sections or stations, a ball or balls descending therein, a signal and devices at each station whereby the ball descending will repeatedly operate the signal substantially as described.

20. A signal comprising a frame or case having a series of baffle-plates forming a ballway, a ball descending in said ballway and a signal arranged to be operated by the ball as it descends said way substantially as described.

21. An apparatus substantially as described comprising a casing, a ball descending therein and a signal arranged to be repeatedly operated by said ball in its descent substantially as described.

WILLIAM S. WOODS.

Witnesses:

SOLON C. KEMON,
PERRY B. TURPIN.