No. 874,608. PATENTED DEC. 24, 1907.

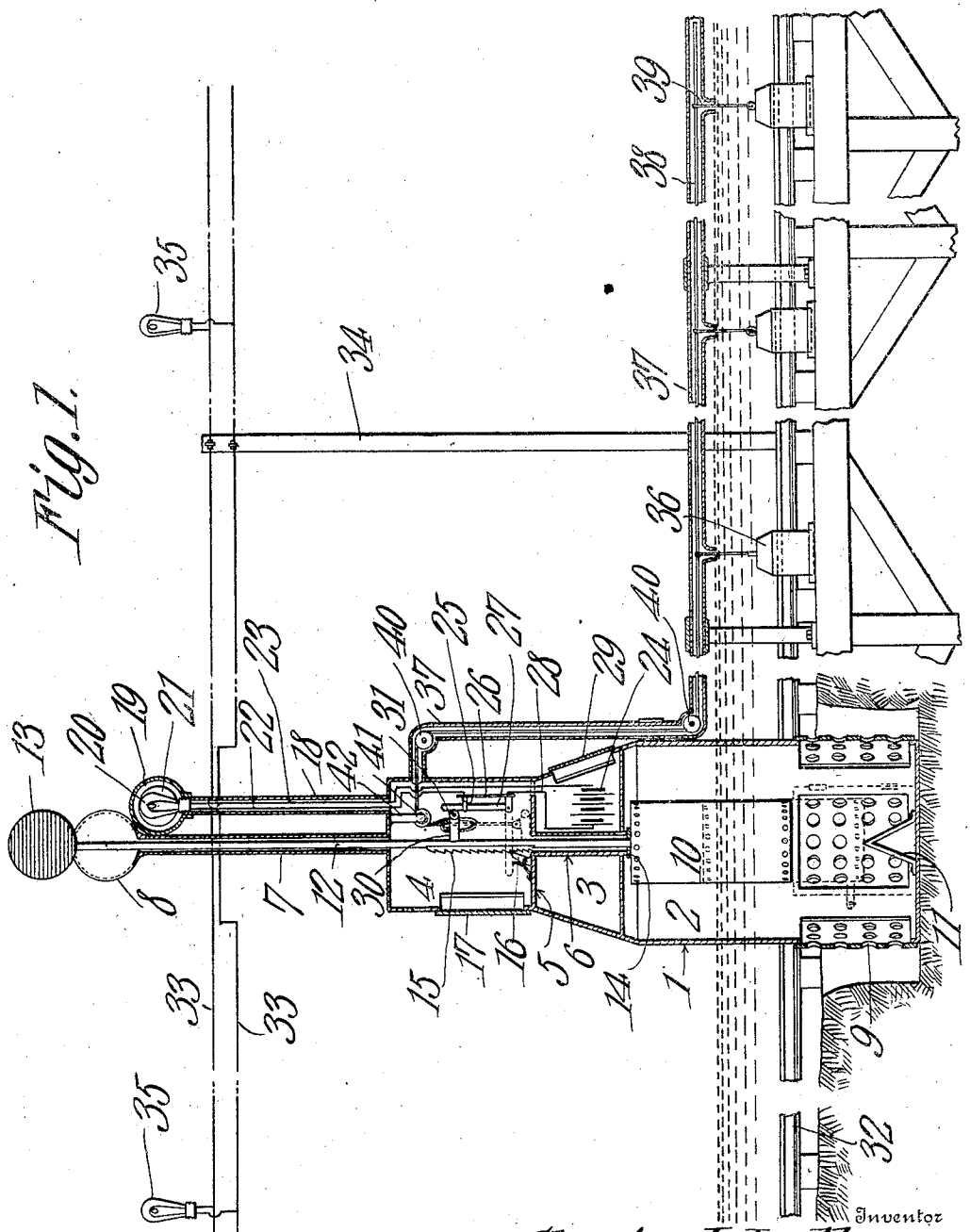
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DANGER SIGNAL.

APPLICATION FILED AUG. 13, 1907.

2 SHEETS--SHEET 1.

Fig. 1.



Witnesses

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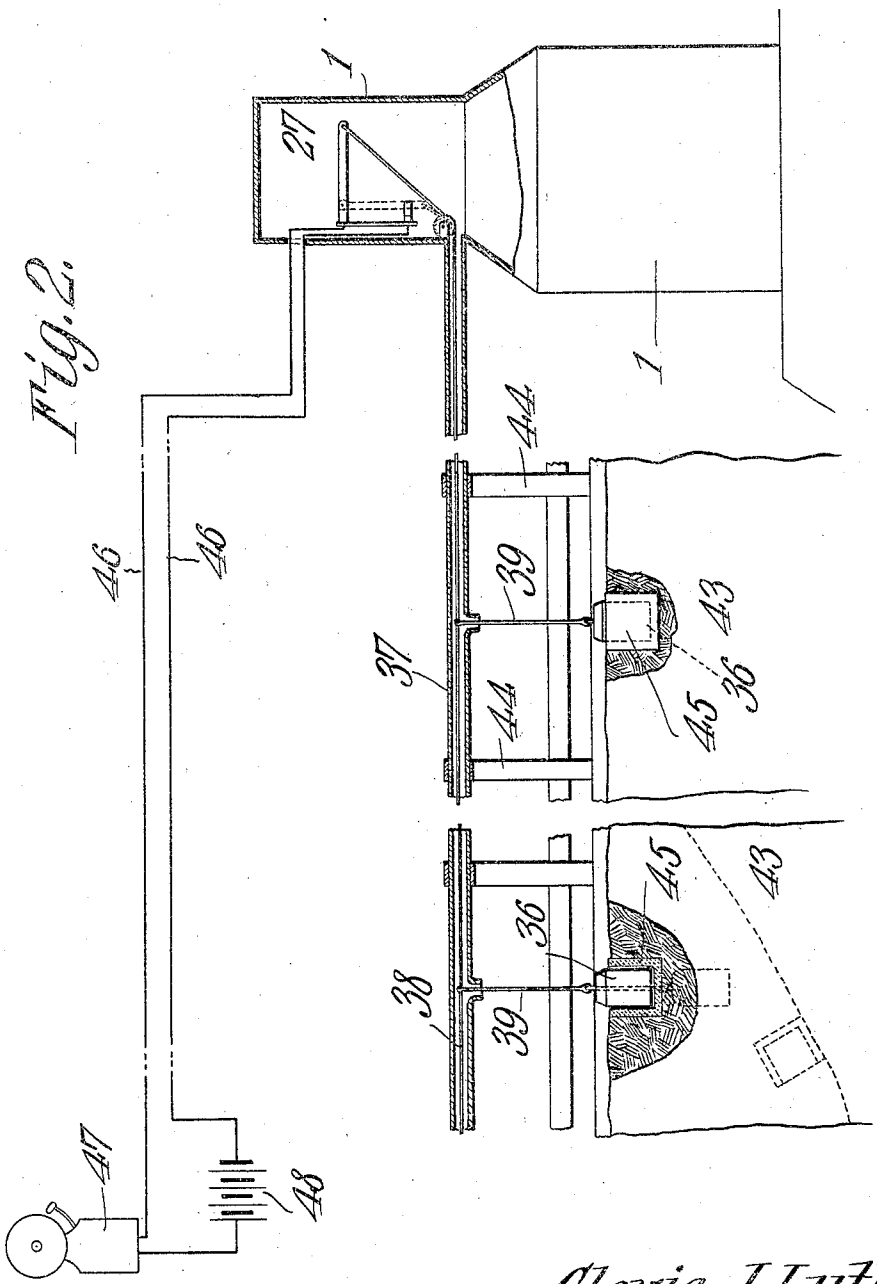
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2 SHEETS—SHEET 2.

Fig. 2.



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DANGER-SIGNAL.

No. 874,608. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed August 13, 1907. Serial No. 388,386

To all whom it may concern:

Be it known that I, CLEVIA J. LUTHER, a citizen of the United States, residing at Desloge, in the county of St. Francois and State of Missouri, have invented a new and useful Danger-Signal, of which the following is a specification.

This invention has reference to improvements in danger signals and is designed more particularly to give notice of dangerous conditions due to inundations or fire.

The invention comprises means responsive to a rise in water level to effect the closure of an electric switch across the terminals of a charged electric circuit whereby electric lamps are lighted up or electric bells are caused to ring, thus giving notice of the existence of dangerous conditions. Furthermore, provision is made whereby a bridge or trestle destroyed in part or in whole by fire, or from other cause, or the washing away of a levee, will also display or sound a danger signal, preferably both adjacent to the point of danger and at some distant point or points. Moreover, provision is made whereby in the case of railroads, both day and night danger signals are displayed should the railroad become inundated, and thereby be dangerous to the passage of trains.

The invention will be fully understood upon consideration of the following description, taken in connection with the accompanying drawing forming part of this specification, in which

Figure 1 is a sectional view of the danger signal apparatus as applied to a railroad and a bridge or trestle connected therewith, with parts shown in elevation and other parts shown diagrammatically. Fig. 2 is a partially diagrammatic view showing the application of the invention for the display of danger signals on the washing away of the levee.

Referring to the drawings, there is shown a casing 1 composed of metal or other suitable material and suitably shaped to form three superposed chambers, 2, 3 and 4, the chambers 2 and 3 being separated by a horizontal partition 4, and the chambers 3 and 4 being separated by a horizontal partition 5, while the chambers 2 and 4 are connected by a central tube 6 passing through the chamber 3. Rising from the top of the casing 1 is a tube or pipe 7 terminating at the upper end in a stationary guard disk 8, to be hereinafter referred to.

The lower end of the cylinder 2 is provided with a number of perforated plates or grids 9 through which water reaching the level of the chamber 2 may enter the latter. Within the chamber 2 there is a float 10 which may be in the form of a cylinder, as shown, or may be otherwise shaped, as desired, and normally this float rests by gravity upon a support 11 in the bottom of the chamber 2.

Extending upward from the float is a rod 12 passing through the tube 6 and up through the chamber 4 and into and through the pipe 7 and beyond the upper end of the same where it carries a target 13 which may, if desired, be in the form of a disk and painted red, so that, when displayed, it may denote the presence of danger. The length of the rod 12 is such that when the float 10 is resting upon the support 11, the target 13 is behind the guard 8, or, more properly, between two guards 8, since there are a pair of such guards suitably spaced apart upon the top of the rod 7, so that when the target is between said guards, it is invisible. Now, should water reach the grids 9, it will flow into the chamber 2, and, should it continue to rise, the float 10 will ultimately be lifted, thus causing the target 13 to be displayed above the guard 8. Surrounding the rod 12 at the point where it rises from the float 10 there is a washer 14 of leather, rubber, or other suitable material, which, when the float has been raised by the inflowing water to a sufficient extent to fully display the target 13, closes the lower end of the tube or pipe 6 and thereby prevents any inflow of the water into the chamber 4.

The rod 12 carries a rack bar 15 in the path of which is a spring actuated pawl 16 within the chamber 4 and pivotally supported upon the partition 5. Now, when the float rises, the rack bar moves freely past the pawl 16, but the return movement of the float is prevented by the pawl 16. The danger signal is therefore held in the displayed position until released therefrom by the withdrawal of the pawl 16 from the teeth of the rack bar 15. To permit access to the pawl 16, the chamber 4 is accessible through a door or closure 17 provided in the walls of said chamber 4. Rising from the top of the

casing 1 there is another pipe 18 at the upper end of which there is provided a receptacle 19 for an electric lamp 20, and in the sides of the receptacle 19 are bull's eyes 21 which may be made of red glass, so that the lamp 20 when lighted will cause the display of red light signals.

The terminals of the lamp 20 are connected by conductors 22, 23, one to a battery 24 housed within the chamber 3 and the other to one terminal or jack 25 of a switch 26, the switch arm 27 of which is connected by a conductor 28 to the other terminal of the battery 24. Access is had to the battery 24 through a door 29 in one side of the chamber 3.

Fast upon a rod 12 is a horizontally projecting arm 30 at the free end of which there is a roller 31. When the float 10 is in its lowermost position, the switch arm 27 may be moved to open the circuit and will then lie horizontally above the arm 30. Now, when the float 10 is caused to rise by an influx of water into the chamber 2, the arm 30 moves upward with the rod 12 and the roller 31 engages the arm 27 near its pivot point. The continued upward movement of the float 10 will ultimately cause the switch arm to move into engagement with the jack 25, thus closing the circuit of the lamp 20, and the latter being fed by the battery 24 will glow, thus showing beams of red light through the bull's eyes 21.

In the drawing, Fig. 1, is shown a portion of a railroad track 32 which is supposed to be located on low ground subject to inundation, and adjacent to the track, or at least within the zone subject to inundation, there is located one of the casings 1 with the float 10, target 13, and lamp 20. For convenience of illustration, the target 13 and lamp 20 are shown as visible in planes at right angles to the length of the track 32, but, in practice, these parts will be placed in their proper relation to the track so as to be visible to an engine man on a train approaching the point of danger, the red target being used for day signals and the lamp being used for night signals. Now, it is desirable that in the case of dangerous conditions, that danger signals be displayed at distant points, say, for instance, at the nearest railway station on either or each side of the danger zone. For this reason, there are branched off from the conductors 22 and 23 other conductors 33 which may be mounted upon poles 34 located at convenient points, and these conductors may be carried to distant lamps 35 which will light up when the circuit is closed by the switch 26. If the distance is considerable, the other batteries may be located at the distant stations and suitably connected up to charge the line when the switch 26 is closed, or other sources of current than batteries may be used. In practice, when batteries are used, I prefer to employ storage batteries.

Now, in railroads subject to inundations, there is more or less amount of trestle work, or there may be one or more bridges. Such trestle work or bridge if made of wood may be destroyed in part or in whole by fire, or may be washed away whether of wood, stone or metal. In order to provide for the display of either day or night signals in case of the partial or total destruction of the bridge or trestle, there is placed upon each span of the bridge or trestle, or at other points thereon, one or more weights 36. Extending along the bridge or trestle adjacent to the weights is a pipe 37 ultimately connected to the casing 1 at the chamber 4. Within the pipe 37 is a wire 38 having branch connections 39 to the weights 36. Since it may be necessary, in order to bring the pipe 37 to the chamber 4, to provide said pipe with more bends or elbows, said bends or elbows may contain pulleys 40 around which the wire 38 passes, and within the chamber 4 there is another pulley 41 mounted upon brackets 42, and the wire 38 passes over this pulley 41 and is connected to the arm 31 before referred to. Now, let it be supposed that the float is resting upon the support 11, and that the parts are all in the path of safety. Let it be further supposed that a section of the bridge or trestle is destroyed by fire, or from any other cause. Under such conditions, the respective one of the weights 36 will fall by gravity and pull the wire 38 with it. The weight 36 is made sufficiently massive to overcome the weight of the float 10 and pull the rod 12 up until the float 10 comes in contact with the bottom of the pipe 6. This will display the target 13 and also light the lamp 20. If the conditions be such that the wire 38 or one of the connections 39 carrying the weights be broken when the weight descends, the pawl 16 will hold the target 13 in displayed condition until such time as a suitably authorized attendant may again set the target at safety. Since it may be at times desirable to gain access to the chamber 2, one of the grids 9 may be in the form of a door, as indicated in dotted lines in Fig. 1.

Referring now to Fig. 2, the device is shown as more particularly adapted for displaying danger signals should a break occur in a levee. In this figure, the levee is diagrammatically indicated at 43 and the pipe 37 is shown as supported upon posts 44 erected at intervals along the levee. The weights 36 may be each contained in a suitable box or casing 45 which may be sunk in the surface of the levee. The wire 38 in this instance enters the casing 1 and is connected directly with the switch arm 27. Electric conductors 46 lead from the switch to a distant point and there include an electric bell

47 and a suitable source of electric energy conventionally indicated at 48 and may consist of a storage battery or a primary battery, or a suitable dynamo.

It will be understood, of course, that the lamps 35 shown in Fig. 1 may be replaced by bells, or that both lamps and bells may be used together. Furthermore, the structure more particularly adapted for indicating breaks in levees may form a part of the structure shown in Fig. 1 where a railroad may be endangered by the break in the levee.

What is claimed is:—

1. A danger signal comprising a float, a target carried thereby, means for hiding said target when the float is in its lowermost position, an electric switch separate from the float and parts carried thereby but within the path of and actuated by the float when raised or lifted, and an electric circuit including said switch and electric translating devices capable of producing signals.

2. A danger signal comprising an electric circuit, a switch in said circuit, a float, connections between the float and switch for closing the latter when the float is lifted, a target carried by the float, electric signal indicating devices rendered active on the closure of the electric circuit, and gravity operated means located upon and supported by structures subject to dangerous conditions, and a common connection between all the gravity means and the electric switch whereby the latter is operated when any one of the gravity means becomes active.

3. A danger signal comprising an electric circuit, a switch in said circuit, a float, connections between the float and switch for closing the latter when the float is lifted, a target carried by the float, electric signal indicating devices rendered active on the closure of the electric circuit, and gravity operated means located upon and supported by structures subject to danger conditions, and a common connection between all the gravity means consisting of a wire separately connected to each gravity means and also connected to that part of the float structure operating to engage the switch.

4. A danger signal comprising a casing having a chamber communicating with the exterior of the casing, a float within said chamber, a rod carried by said float, a target carried by said rod, means carried by the casing for hiding the target, a pawl and ratchet detent for permitting the float to rise but preventing its return movement, an electric switch within the casing, an arm carried by the rod for engaging said switch to close the same, an electric lamp carried by the casing, a source of current carried by the casing, and electric connections from the source of current including the lamp and switch.

5. A danger signal comprising a casing having a chamber communicating with the exterior of the casing, a float within said chamber, a rod carried by said float, a target carried by said rod, means carried by the casing for hiding the target, a pawl and ratchet detent for permitting the float to rise but preventing its return movement, an electric switch within the casing, an arm carried by the rod for engaging said switch to inclose the same, an electric lamp carried by the casing, a source of current carried by the casing, and electric connections from the source of current including the lamp and switch, a pipe or conduit leading from the casing and along a structure subject to dangerous conditions, weights located on and supported by said structure, a wire connected to the arm carried by the rod and leading to the pipe or conduit, and branch connections from the wire to each of the weights.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CLEVIA J. LUTHER.

Witnesses:
E. F. MORRIS,
J. L. WHITENER.