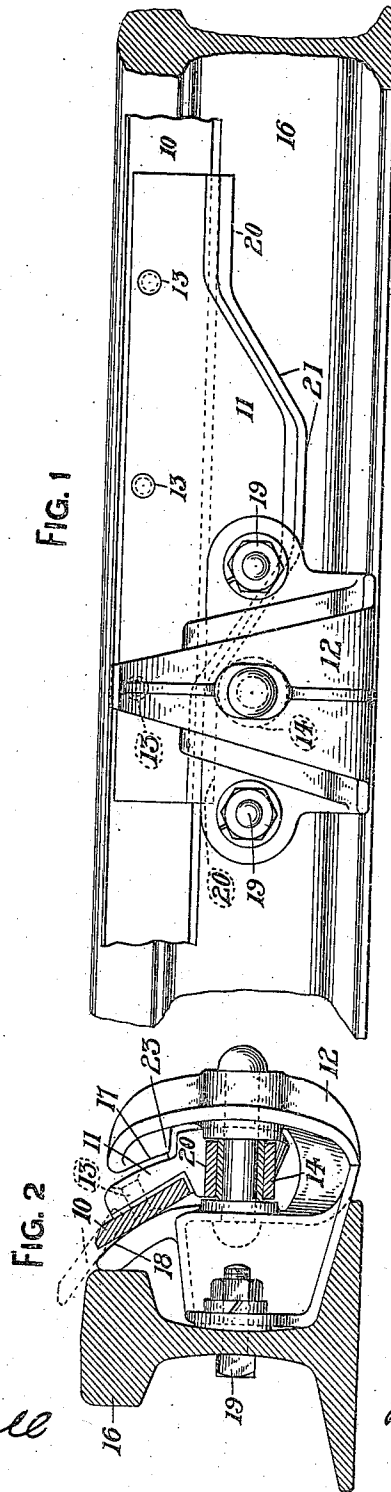


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A. C. LIVERMORE.
DETECTOR BAR.
APPLICATION FILED NOV. 11, 1910.

Patented May 2, 1911.
2 SHEETS-SHEET 1.



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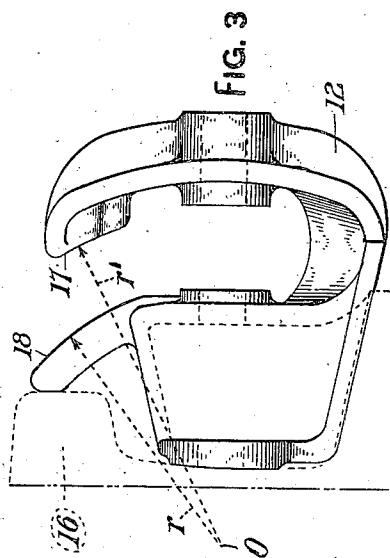
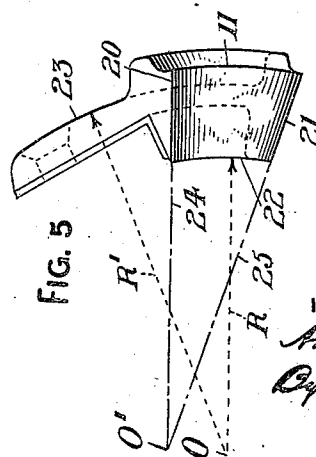
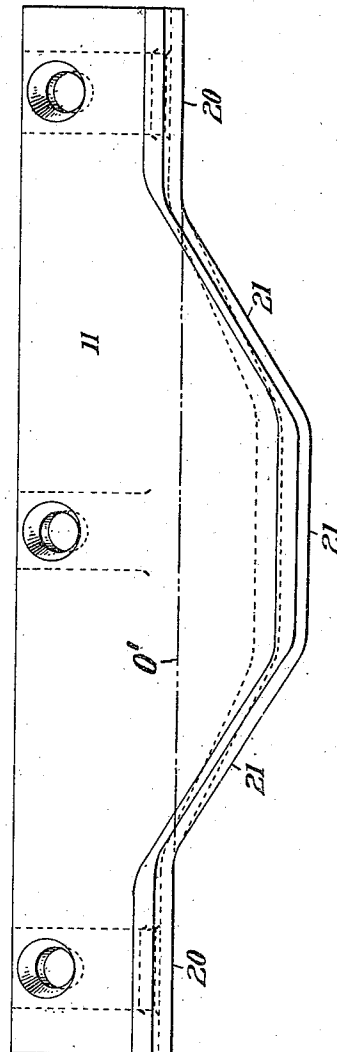


FIG. 4



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UNITED STATES PATENT OFFICE.

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DETECTOR-BAR.

991,073.

Specification of Letters Patent.

Patented May 2, 1911.

Application filed November 11, 1910. Serial No. 591,854.

To all whom it may concern:

Be it known that I, ARTHUR C. LIVERMORE, a citizen of the United States, and resident of the borough of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Detector-Bars, of which the following is a specification.

My invention relates to detector bars and to the supports or "clips" used in connection therewith.

I will describe a detector bar and a detector bar "clip" embodying my invention, and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a view showing in side elevation, a portion of a railway rail and a portion of a detector bar and a support or "clip," embodying my invention. In this view the detector bar is shown in its usual position, below the level of the top of the rail. Fig. 2 is an end elevation, partly sectioned, of the apparatus shown in Fig. 1, and showing in dash lines the detector bar in its upper position, partially over the head of the rail. Fig. 3 is a view showing the support or "clip" in end elevation. Figs. 4 and 5 are front and end elevations respectively of the motion plate shown in Figs. 1 and 2.

Similar reference characters refer to similar parts throughout the several views.

Referring now to Figs. 1 and 2, 16 designates a portion of a railway rail, 10 a portion of a detector bar, 11 a motion-plate secured to the bar, and 12 a support or "clip" for the detector bar which support or "clip" is secured to the rail in any suitable manner, as for example by means of bolts 19. It will be understood that the detector bar 10 is provided with a plurality of motion plates 11 and with a plurality of supports or "clips" 12, one for each motion plate.

The detector bar, it will be understood, is reciprocated, longitudinally, and in its opposite longitudinal movements the lower cam face of each motion-plate 11 travels on a roller 14 suitably journaled in the adjacent support 12 to move the detector bar upward, and over the head of the rail in the arc of a circle.

When the bar is in its normal or lower position, a portion 20 of the cam surface of the motion-plate 11 rests on the roller 14, as indicated in Figs. 1 and 2. As the bar

is moved parallel with the rail, a portion 21 of the cam surface of the motion plate 11 rides on the roller 14, causing the bar to rise upwardly in the usual manner. In a detector bar embodying my invention, however, these longitudinal and upward movements are accompanied by a movement of the detector bar in the arc of a circle over the head of the rail. The detector bar when in its highest and extreme position assumes substantially the position indicated in dash lines in Fig. 2. As here shown, I produce this movement in the arc of a circle by forming the inside faces 17 and 18 of the upper portion of the supporting bracket 12 (see Fig. 3) in the form of arcs of circles whose center is at the point 0. These faces therefore serve as guides to the motion plate 11 whereby the latter and the bar 10 are constrained to move upward and over the head of the rail 16. To accommodate the motion-plate 11 to movement between the curved guiding faces 17 and 18, I prefer to construct the surfaces 22 and 23, which bear on the guiding faces of the support 12, in the form of arcs of circles having a center 0 (see Fig. 5) which corresponds to the center 0 of the guiding surfaces 17 and 18 in Fig. 3. That is, the radius of curvature R of the surface 22 of the motion-plate 11 is the same as the radius r of the face 18 of bracket 12, and the radius of curvature R' of the surface 23 is slightly less than the radius r' of face 17, to permit of free movement of the motion plate 11 between the faces which guide it.

The bearing surfaces or cam surfaces 20 and 21 of the motion-plate 11 are preferably constructed in such form that they will rest flatly on the surface of the roller 14 throughout the movement of the motion plate. I may best explain the construction of these cam surfaces 20 and 21 by assuming them to be formed of an infinite number of lines perpendicular to the longitudinal direction of the movement of the motion plate. These lines are not parallel, but on the contrary they all pass through a center line $0'$, as indicated in Figs. 4 and 5. In other words, the line $0'$, is a "line center" for the lines forming the surfaces 20 and 21. This line center $0'$ is elevated above the common center 0 a distance equal to the radius of the roller 14. Hence the construction is such that the surfaces 20 and 21 will rest flatly

upon the roller 14 at all points in the movement of the detector bar.

Having thus described my invention, what I claim is:

5 1. In combination with a railroad rail; a detector bar; a support therefor having curved surfaces for constraining the detector bar to a movement in the arc of a circle over the head of the rail; a roller; and a
10 motion plate secured to the detector bar and having a cam surface adapted to ride upon the roller and to thereby move the detector bar upward when the bar is moved longitudinally, the cam surface being formed to
15 present a flat bearing surface to the roller at all times during the movement of the detector bar.

2. In combination with a railroad rail; a detector bar; a support therefor having
20 curved surfaces for constraining the detector bar to a movement in the arc of a circle over the head of the rail; a roller; and a motion plate secured to the detector bar and having a cam surface adapted to ride upon
25 the roller and to thereby move the detector bar upward when the bar is moved longi-

tudinally, said motion plate having curved surfaces to correspond to the curved surfaces of the support.

3. In combination with a railroad rail; 30 a detector bar; a support having curved surfaces for constraining the detector bar to a movement in the arc of a circle over the head of the rail; a roller; and a motion plate secured to the detector bar and having 35 a cam surface adapted to ride upon the roller and to thereby move the detector bar upward when the bar is moved longitudinally, the said cam surface being formed to present a flat bearing surface to the roller 40 at all times during the movement of the detector bar, and the side faces of said motion plate being curved to correspond to the curved surfaces of the support.

In testimony whereof, I have signed my 45 name to these specifications in the presence of two subscribed witnesses.

ARTHUR C. LIVERMORE.

Witnesses:

H. S. BEAKES,

JOHN S. HOLLIDAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
