No. 708,998. Patented Sept. 16, 1902.

H. L. CHURCH.

CATTLE GUARD FOR RAILWAY TRACKS.

(Application filed Sept. 7, 1901.)

(No Model.)

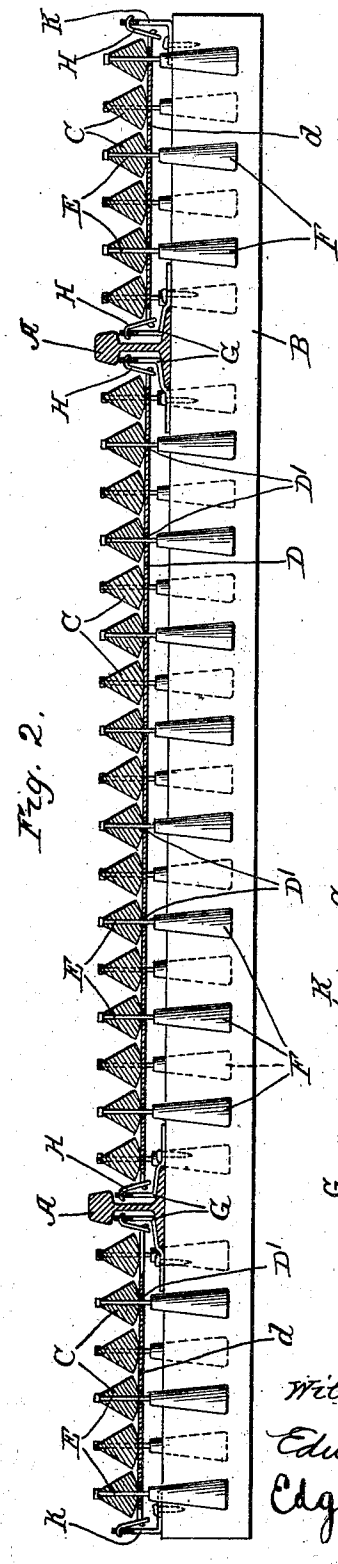


Fig. 2.

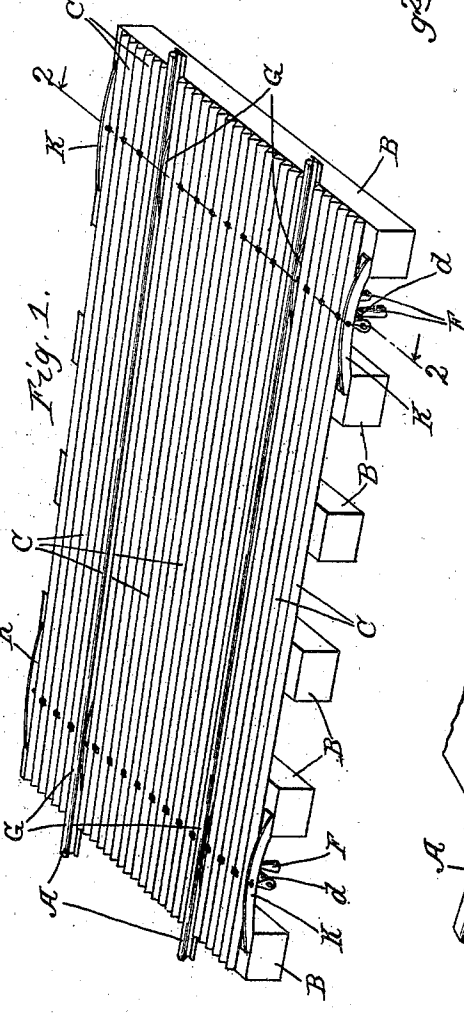


Fig. 1.

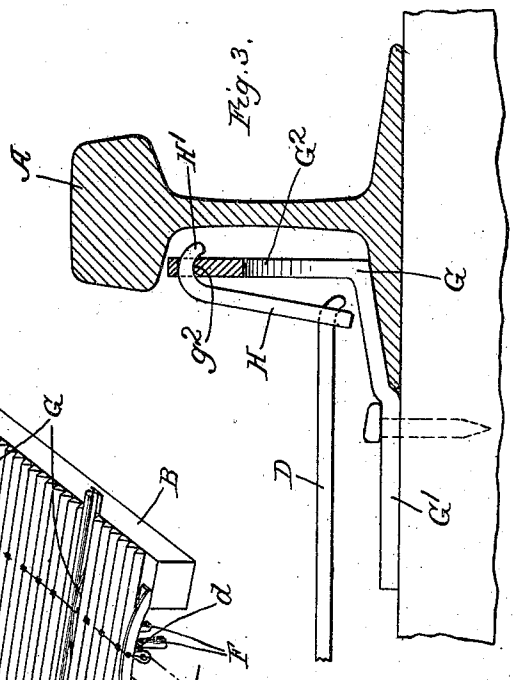


Fig. 3.

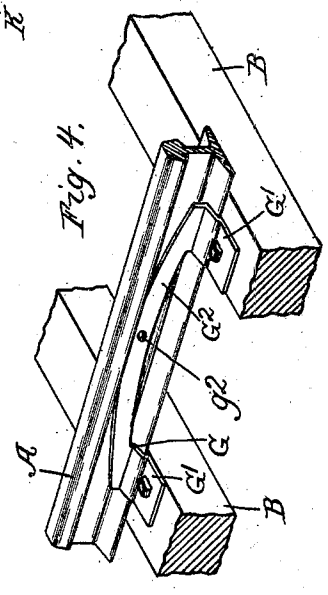


Fig. 4.

Witnesses,
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UNITED STATES PATENT OFFICE.

HIRAM L. CHURCH, OF CHICAGO, ILLINOIS.

CATTLE-GUARD FOR RAILWAY-TRACKS.

SPECIFICATION forming part of Letters Patent No. 708,998, dated September 16, 1902.

Application filed September 7, 1901. Serial No. 74,596. (No model.)

To all whom it may concern:

Be it known that I, HIRAM L. CHURCH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cattle-Guards for Railway-Tracks, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved cattle-guard for railway-tracks.

It consists of the characteristics and features of construction set out in the claims.

In the drawings, Figure 1 is a perspective view of my improved cattle-guard. Fig. 2 is a transverse vertical section at the plane indicated by the line 2 2 on Fig. 1. Fig. 3 is a detail view, on an enlarged scale, of the devices for supporting the tread-rail. Fig. 4 is a detail perspective view showing a bracket from which the tread-rail-supporting bars are suspended.

A A are the track-rails.

B B B are the cross-ties.

C C C are the tread-rails of my improved cattle-guard, occupying space between the track-rails and for a short distance outside of them, as is customary in such devices. These tread-rails are of the form in cross-section shown in Fig. 2, having their lower ends downwardly convex, the rails being preferably sectoral in form, so that they present an angle, preferably an acute angle, directly upward to receive the tread of any animal attempting to cross the guard. By reason of this form the tread-rails are adapted to rock upon their support, whatever that support may be, coming to position of rest normally at substantially the middle point of the convex lower edge—that is, with the middle point resting on the support and the acute angle directly upward.

D D are transverse bars upon which the convex lower edges of the tread-rails rest, said bars constituting thereby the immediate support for said rails, on which the latter rock laterally when disturbed. The tread-rails are provided with loose attachments to the supporting-bars D, such attachments being effected by means of bolts E, set through the tread-rails, being rigid therewith and extending through apertures D′ in the bars D, which are sufficiently elongated to allow for the lateral movement of the bolt in the rocking movement of the rail. As a means of more certainly insuring the restoration of the tread-rails to their normal position—that is, with the angle upward and the middle point of their convex lower edge resting on the support—counterpoises F F F, &c., are secured to the lower ends of the bolts E, constituting heads of the bolts, preventing their escape from the bars D, and being sufficiently enlarged toward the lower part (preferably) to materially lower the center of gravity of the entire mass, consisting of the rail and its counterpoise-weights. The effect of this rocking construction is to render the tread-rails very unstable under the tread of an animal attempting to cross the cattle-guard and in the majority of instances to thereby alarm the animal attempting to cross and cause it to retreat after having once set foot on the unstable rail. To increase this sense of instability and the alarm which it will cause, the transverse bars D D are preferably suspended, so that they become sway-bars, having a swinging movement longitudinally of the tread-rails and the track, so that to the lateral rocking movement of the tread-rails there will be added a tendency to yield longitudinally and to reciprocate back and forth as the animal attempts to walk across them, the composite movement resulting from the lateral rocking and the longitudinal reciprocation being one which produces the impression of very great instability.

For the purpose of suspending the bars D, I provide the brackets G, having a base G′, adapted to be spiked to a tie and to extend up over the base-flange of the track-rail to a point underneath the tread or head of the rail, the bracket extending thence directly upward in the upright portion or standard G^2 nearly to the under surface of the head of the rail and having an eye g^2, in which is pivoted a link H, whose hooked end H′ is inserted through the eye, the lower end of the link which hangs above the base of the bracket having an eye in which is engaged loosely the slightly-hooked end of the bar D. This construction is duplicated at the inner side of each of the track-rails, and the length of the transverse bars D being such that when

such ends are engaged with the lower ends of the links said lower ends are held inward—that is, slightly converging—and trending away from the upright standard of the bracket the transverse bars are rendered unstable longitudinally, as well as adapted to swing laterally from the upper pivot of the pendent links. This longitudinal movement of the transverse bars gives a lateral movement to the tread-rails superadded to the lateral movement due to their rocking, as described. Preferably the brackets G are long enough to reach from tie to tie and to be fastened thus to two ties, and the base portion G' and the upright portion G^2 may be cut away between the ties, as seen in Fig. 4, the pivot-aperture for the link H being made about midway between the two ties, as seen in Fig. 4. This brings the transverse bars D at a position overhanging the interval between the ties at about the middle of said interval, so that the space between the ties can be utilized for the counterpoise-weights F on the ends of the bolts E, which attach the tread-rail to said transverse bars. Brackets G are also secured to the outside of the rails, and at a suitable distance outward therefrom corresponding brackets K K, &c., are mounted upon the ties, as seen in Fig. 1, and provided with pivot-apertures for links H, by which the short transverse bars *d*, corresponding perfectly to the longer bars D, which extend over the space between the track-rails, are suspended and adapted to support the tread-rails which form the guard outside the track-rails. In order to further increase the instability or capacity to produce a sense of instability of the tread-rails, alternate rails or alternate groups of said tread-rails may be connected to the transverse supporting-bars at opposite ends, one rail or group of tread-rails being supported at one end to the supporting-bar at that end and the next rail or group of rails being connected to the supporting-bar at the opposite end. The effect of this alternation of connections would be to permit one rail or group of rails to obtain a reciprocating movement, due to the swinging of the sway-bars in one direction, while the next rail or group of rails might be swinging in the opposite direction, so that the two feet of the animal attempting to cross the guard would find the supports yielding in opposite directions longitudinally in addition to being unstable laterally.

One important advantage of the structure above described consists of the protection afforded against the lifting of the guard from the supports by which it is held in the track, either by the suction of the train or by any accidental pending rope or chain which may be dragging from the running-gear of the train in a position rendering it liable to catch the tread-rails of the guard. It is well known that the suction of a rapidly-moving train is sufficient in some instances to lift an amount of weight equal to an entire section of such a cattle-guard and cause it to become entangled with the running-gear, to the destruction at least of the gear and often of the portion of the train with which it becomes engaged, with the additional danger that the parts of the guard may be thrown across the track-rails and derail the train. My construction prevents these dangers, first, by reason of the fact that the brackets from which the structure is suspended stand alongside the rails and have the pivotal connections of the suspending links H overhung by the tread or "ball" of the rail. As a further means of preventing the detachment of the suspending links by upward lifting of the guard structure the links are connected to the brackets in eyes formed in the latter, so that direct upward movement could not occur even if it were not guarded by the overhanging rail. Independently of the fact that the bracket made in bridge form, as described, adapted to span the distance between two consecutive ties gives opportunity for the counterpoise to depend between the ties, this form of bracket is of advantage in that it allows space for the link H to swing laterally with respect to the track, the lower end of said link, with which the transverse bars D are connected, being thus afforded opportunity to pass in under the bar of the bracket to which the pivotal connection of the upper end of the link is made and also allowing room for the end of the bar, which for security extends through the link, to swing endwise without being limited by the web of the track-rail.

I claim—

1. A cattle-guard for railway-tracks, comprising tread-rails; suspended and oscillating transverse supports for such tread-rails; and means for retaining the said rails loosely on such supports.

2. A cattle-guard comprising tread-rails having their lower edges downwardly convex in cross-section; transverse supports for such rails, on which their convex edges rest and are adapted to rock laterally; and means for retaining the tread-rails loosely on said supports, with lateral freedom for their rocking movement.

3. A cattle-guard comprising tread-rails having their lower edges downwardly convex; suspended and transverse oscillating supports for such rails, and means for retaining said rails loosely on their oscillating supports, with freedom for oscillating movement of the supports and lateral rocking movement of said rails.

4. A cattle-guard comprising tread-rails having their lower edges downwardly convex, whereby they are adapted to rock laterally on their supports; supports extending transversely under the convex edges of such tread-rails; and counterpoises depending rigidly from the tread-rails respectively, below the surface of the supports on which the said rails rock.

5. A cattle-guard comprising, in combination with the track-rails, brackets rigid with the rails adjacent thereto; sway-bars suspended from the upper ends of said brackets, extending transversely of the track between the rails, and tread-rails extending parallel with the track-rails, lodged on the sway-bars and loosely connected thereto, to permit said bars to swing laterally, giving the tread-rails longitudinal movement.

6. A cattle-guard for railway-tracks, comprising brackets rigid with the track-rails; sway-bars pivoted on such brackets and extending transversely with respect to the track-rails; tread-rails lodged on the sway-bars, having their lower edges downwardly convex, whereby they are adapted to rock laterally on said bars; and means connecting them loosely to the bars to permit such rocking movement of the tread-rails and oscillating movement of the sway-bars.

7. A cattle-guard for a railway-track, comprising two sway-bars pivotally supported near the level of the tread of the track-rail, depending therefrom, and extending parallel with each other transversely of the track; tread-rails lodged upon said transversely-extending sway-bars, alternate tread-rails having loose connections with one of the sway-bars, and the remaining alternate rails having like loose connections with the other sway-bars; whereby alternate tread-rails are adapted to be moved longitudinally in opposite directions.

8. A cattle-guard for a railway-track comprising parallel sway-bars suspended so as to extend transversely of the track and to oscillate longitudinally thereof; tread-rails lodged on said sway-bars, alternate groups of such tread-rails being loosely connected to one sway-bar and the remaining alternate groups being loosely connected to the other sway-bar.

9. A cattle-guard for a railway-track, comprising upstanding brackets inside the track-rails respectively; links suspended from the upper ends of the said brackets and depending between the brackets; bars pivotally connected to the lower ends of said links, and extending across the track from link to opposite link; said transverse bars being shorter than the distance between the pivotal supports of the upper ends of the links, whereby the links are caused to trend away from their supporting-brackets respectively, affording room for lateral oscillation of the links, and longitudinal reciprocation of the transverse bars supported thereby, in addition to the lateral swinging movement of said bars.

10. A cattle-guard for a railway-track, comprising tread-rails and suspended and oscillating transverse supporting-bars for such tread-rails; brackets having feet or bases adapted to be secured to consecutive ties, and a connecting-bar extending parallel with the track-rail from side to side; links suspended from such connecting-bars, and at their lower ends carrying the said tread-rail-supporting bars; the said tread-rails lodged upon such supporting-bars being adapted to roll thereon and provided with counterpoises which swing in the interval between the ties.

11. A cattle-guard for a railway-track, comprising tread-rails and suspended, oscillating transverse supporting-bars for said rails, and brackets from which such bars are suspended lodged on the base-flanges of the track-rails.

12. A cattle-guard for a railway-track, comprising tread-rails and suspended and oscillating transverse supporting-bars for said rails, and brackets from which such bars are suspended, having the point at which the suspension is made overhung by the cap or tread of the rail.

13. A cattle-guard for a railway-track, comprising tread-rails and suspended, oscillating transverse supporting-bars for said rails, brackets from which such bars are suspended mounted between the track-rails, and links by which the bars are suspended from the upper part of the brackets, the latter being cut away between their supports at the lower part under the point of suspension of the links, permitting the latter to swing in between the supports.

In testimony whereof I have hereunto set my hand, at Lincoln, Nebraska, this 29th day of August, 1901.

HIRAM L. CHURCH.

In presence of—
JOHN M. STEWART,
FRANK H. WOODS.