(No Model.) 2 Sheets—Sheet 1.

W. F. CRANE & G. H. REYNOLDS.

INCLINED HOIST.

No. 368,325. Patented Aug. 16, 1887.

Fig 1.

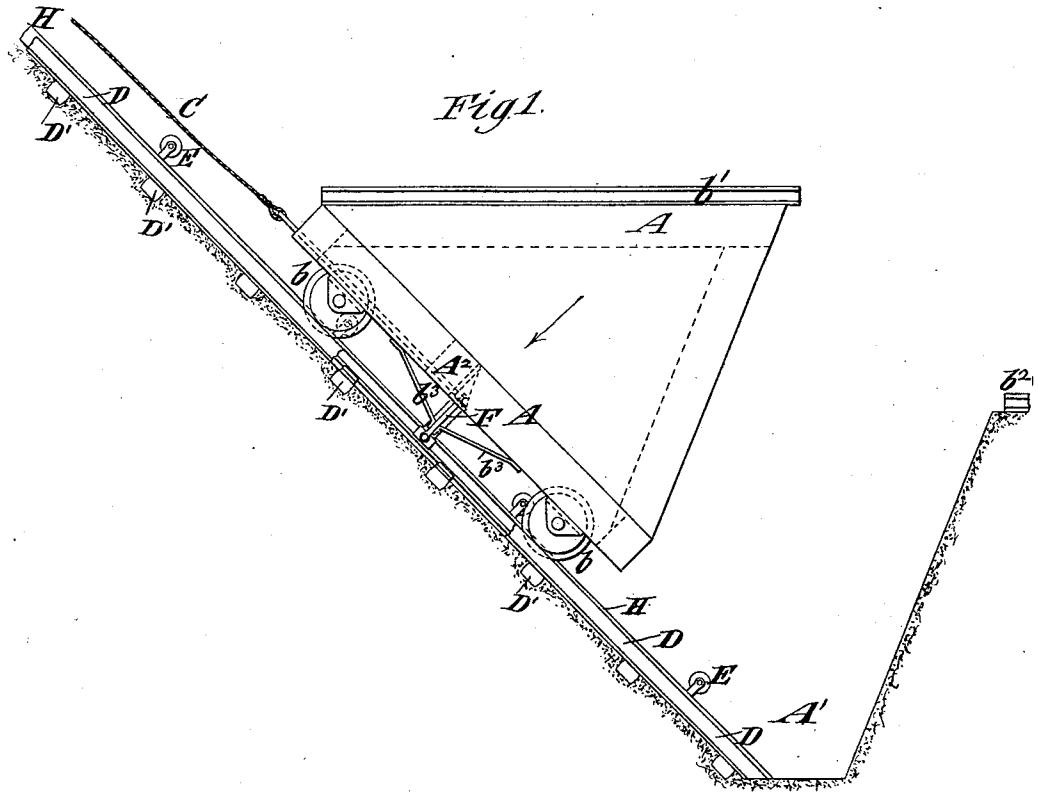
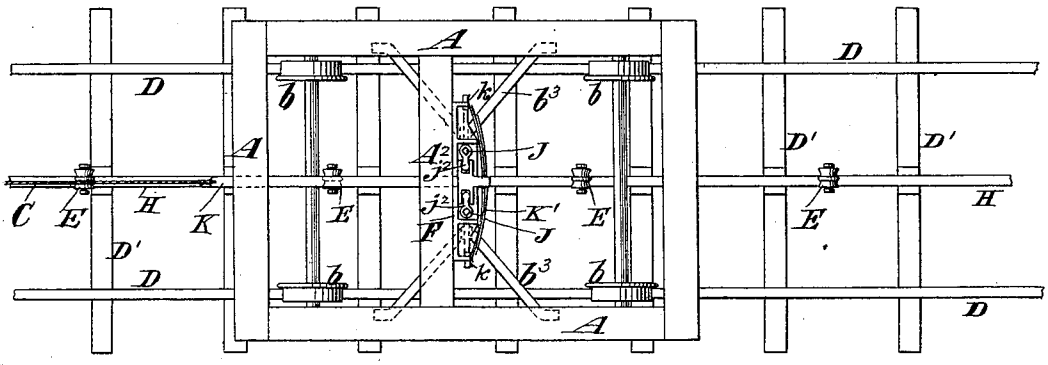


Fig 2.



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2 Sheets—Sheet 2.

(No Model.)

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Fig. 3.

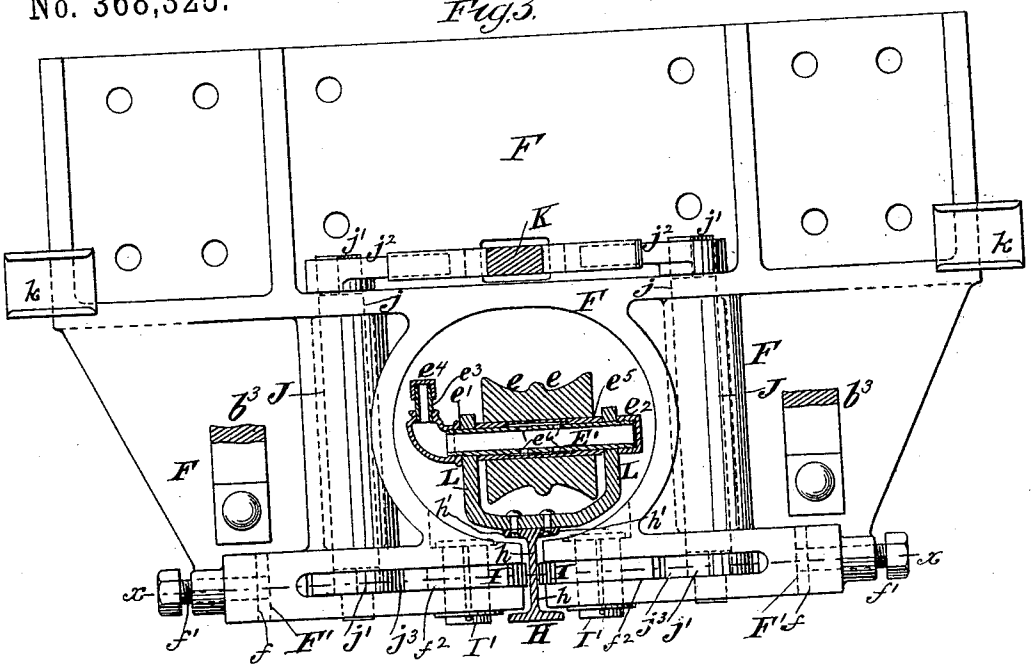


Fig. 5.

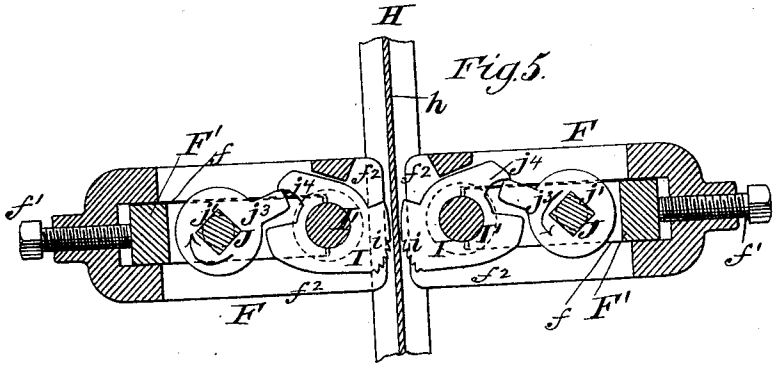
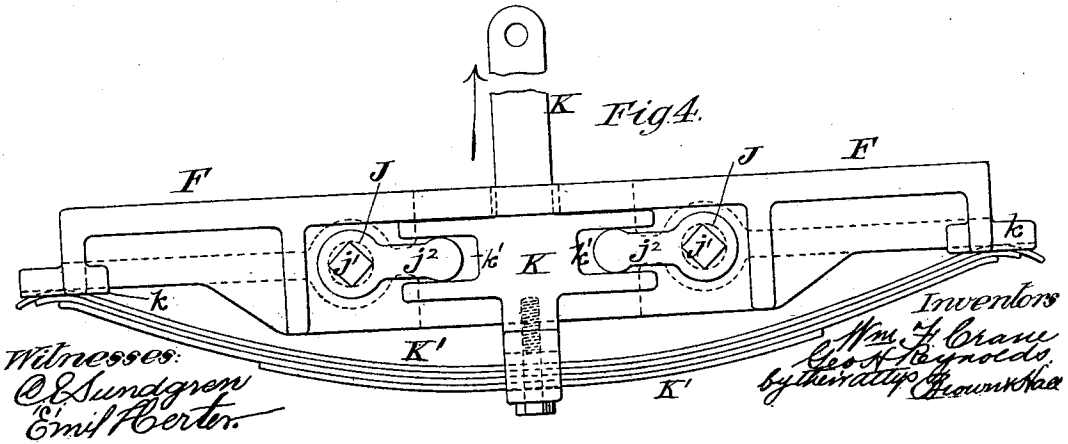


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM F. CRANE AND GEORGE H. REYNOLDS, OF NEW YORK, N. Y., ASSIGNORS TO THE CRANE ELEVATOR COMPANY, OF CHIGAGO, ILLINOIS.

INCLINED HOIST.

SPECIFICATION forming part of Letters Patent No. 368,325, dated August 16, 1887.

Application filed April 6, 1887. Serial No. 233,860. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. CRANE and GEORGE H. REYNOLDS, both of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Inclined Hoists, of which the following is a specification.

Our invention relates to cars which are designed for use on inclined railways, and which are provided with safety-dogs which, in case of the hoisting-rope parting, grip a T-shaped, I-shaped, or flanged safety-rail placed between the track-rails and prevent the car from running backward and from overturning.

An important object of our invention is to provide for more certain and sure operation of the two safety-dogs by the same spring applied to the draw-bar.

A further object of our invention is to construct and arrange the cable-supporting sheaves so that they will be capable of longer wear than heretofore, and so as to permit of their adjustment to support the cable upon either of two corresponding cable seats or grooves with which they are formed.

In carrying out our invention we secure between the track-rails a safety-rail of I-shaped transverse section, or having lateral flanges at or near the top, and on which are secured at intervals in its length cable-supporting sheaves, and a car provided with safety-dogs arranged to engage opposite sides of the web of the rail, and a draw-bar for the attachment of the hoisting-cable, and to which a safety-spring is applied for throwing both safety-dogs into action on the parting of the cable.

The invention consists in novel combinations of parts, which are hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a portion of an inclined hoist embodying our invention. Fig. 2 is a plan or face view of the car-frame and railway, looking in the direction of the arrow, Fig. 1, at right angles to the plane of inclination. Fig. 3 is an elevation in a plane at right angles to the line of the rails, showing upon an enlarged scale a frame which carries the safety devices, and which is secured upon the car; and Figs. 4 and 5 are respectively a plan of such frame and a horizontal section upon about the plane of the dotted line x x, Fig. 3.

Similar letters of reference designate corresponding parts in all the figures.

A designates the car, which is provided with supporting-wheels b, and which, by means of a rope or cable, C, is drawn upward along track-rails D, supported upon suitable sleepers or timbers, D'. At the bottom of the hoist is a pit or recess, A', in which the car A may be lowered to such a position that the rails b' upon the car will be coincident with stationary rails b^2, and from the stationary rails b^2 a loaded wagon may be run onto the rails b' on the car A, or an empty wagon may be run from the car A onto the stationary rails b^2. In the movements of the car the cable C runs upon cable-supporting sheaves E, which are arranged between the track-rails D, and are supported and constructed as we shall shortly describe.

Extending transversely across the car, and transversely to the line of the track-rails D, is a frame or casting, F, which may be strongly bolted to one of the cross-timbers A^2 of the car A, and which may be additionally sustained by braces b^3, extending from it to the car body or frame. The frame F, which may be a strong iron casting, supports the safety devices, which we shall now proceed to describe.

In case of the hoisting-cable C parting, it is desirable not only to prevent the downward movement of the car A along the track-rails D, but also to prevent the car from overturning backward, either of which accidents would be almost equally disastrous.

Between the track-rails D is a safety-rail, H, which has at or near the top laterally-projecting flanges, and with the web or portion of this rail H, below the flange, the safety dog or dogs of the car engage. In this example of our invention the safety-rail H is made in the form of an I-beam, and there are upon the car oppositely-arranged safety-dogs I, which usually have toothed faces and which engage with the web h of the safety-rail below its top flanges, h'. It will therefore be seen that the safety-dogs I serve both to prevent the downward

movement of the car along the track-rails and to prevent the car from overturning backward in case of the parting of the hoisting-cable C.

We have shown the safety-dogs I as having toothed or other faces *i*, constructed to engage strongly with the web *h* of the safety-rail H, and these dogs are constructed with pivots or journals I′ and are operated by means of rock-shafts J. The rock-shafts J are journaled at *j* in the frame F, and at their lower ends are journaled in bearing-blocks F′, which are fitted to slide toward and from each other in vertical slots or slideways *f* formed in the frame F. The bearing-blocks F′ form half the bearings for the dog-pivots I′, and they may be adjusted in the slots or slideways *f* by means of set-screws *f*′. At their upper and lower ends the rock-shafts J are squared, as at *j*′, or otherwise constructed to receive upon their upper ends laterally-extending arms j^2, and to engage at their lower ends with toes j^3. The frame F and the bearing-blocks F′ are both of them constructed with horizontal slots f^2, which receive the dogs I and their operating-toes j^3, as best shown in Fig. 5, and the toes j^3 engage with notches j^4 formed in the safety-dogs I.

From the above description it will be seen that any turning movement of the rock-shafts J in the direction of the arrows shown in Fig. 5 will bring the toothed or otherwise constructed face *i* of the dogs I into engagement with the web *h* of the safety-rail.

Guided in the upper portion of the frame F is a draw-bar, K, to which the hoisting-cable C may be connected, and to which is applied a spring, K′, having its ends resting in seats *k* provided upon the frame F. A pull upon the draw-bar K in the direction indicated by the arrow in Fig. 4 will compress the spring, and through the laterally-extending arms j^2 of the rock-shafts J, which engage notches or recesses *k*′ in the draw-bar, the safety-dogs I will be held inoperative and in the position shown in Fig. 5. When the cable C breaks, the spring K′, by its resilience, will move the draw-bar in the direction opposite to that indicated in Fig. 4 by the arrow, and will turn the rock-shafts J in the directions indicated by the arrows in Fig. 5, in order to bring the safety-dogs I into operative position to automatically engage the web *h* of the safety-rail H, and by engaging with such safety-rail will stop the downward movement of the car, and will also prevent it from overturning backward.

The cable-supporting sheaves E are best shown in Fig. 3. Each is journaled or supported in a hanger or yoke, L, which may be riveted or otherwise permanently secured to the top of the safety-rail H, and, as here shown, each sheave E has two circumferential grooves or cable-seats, *e e*, and is so supported that one of said grooves or seats will be substantially central over the safety-rail H and between the two track-rails in the line of the cable C. We have shown a hollow pin or journal, E′, which may be secured in proper position in the hanger or yoke L by means of a shoulder, *e*′, bearing against one end of the hanger or yoke and the cap e^2, secured upon the opposite end of the journal E′. This journal has an upward extension, e^3, closed by a cap, e^4, and, being hollow, is adapted to contain a a considerable quantity of oil. We have shown the sheave E as having a lining or bush, e^5, which turns upon the pin or journal E′, and through holes e^6 in the pin or journal oil is delivered to the contact or bearing surfaces of the sheave E and the journal or pin E′. When one cable seat or groove *e* of the sheave E becomes too much worn for proper use, the cap e^2 may be removed and the sheave reversed in its yoke or hanger L end for end, so as to bring the other groove or seat *e* into operative position.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in an inclined hoist, and with the track-rails thereof, of a safety-rail secured between the track-rails and made in the form of an **I**-beam, or having laterally-projecting flanges near the top, a car provided with safety-dogs arranged to engage the web of the safety-rail on opposite sides thereof, a draw-bar connected with the safety-dogs, and a spring applied to the draw-bar and serving to move the draw-bar and throw the dogs into action on the parting of the hoisting-cable, substantially as herein described.

2. The combination, in an inclined hoist, and with the track-rails thereof, of a safety-rail secured between the track-rails, and to which are secured at intervals in its length cable-supporting sheaves, and a car provided with a safety dog or dogs arranged to engage the safety-rail, substantially as herein described.

3. The combination, with the track-rails of an inclined hoist and a car arranged to move thereon, of the cable-supporting sheaves E, provided with double grooves or cable-seats, and yokes or hangers in which the sheaves are supported nearer one track-rail than the other, and in which the sheaves are reversible end for end to bring either groove or cable-seat into position for use, substantially as herein described.

4. The combination, with the inclined track-rails and safety-rail, of a car running on the track-rails and having secured to its under side a frame, as F, rock-shafts journaled in said frame and having connected with their lower ends safety-dogs for gripping the safety-rail, and a spring-actuated draw-bar engaging the upper ends of the rock-shafts, substantially as herein described.

5. The combination, with the car A and a frame, F, depending therefrom, of the pivoted safety-dogs I, the rock-shafts J, journaled in said frame and having at their lower ends toes engaging the dogs and at their upper ends laterally-projecting arms, and a spring-actuated draw-bar, K, guided in said frame and engag-

ing the rock-shaft arms, substantially as herein described.

6. The combination, with the car A and a frame, as F, depending therefrom, of the pivoted safety-dogs I, adjustable blocks F, sliding in said frame and forming half-bearings for the dogs, the rock-shafts J, journaled in said frame and blocks and having at their lower ends toes engaging the dogs and at their upper ends laterally-projecting arms, and a spring-actuated draw-bar engaging the arms of the rock-shafts, substantially as herein described.

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