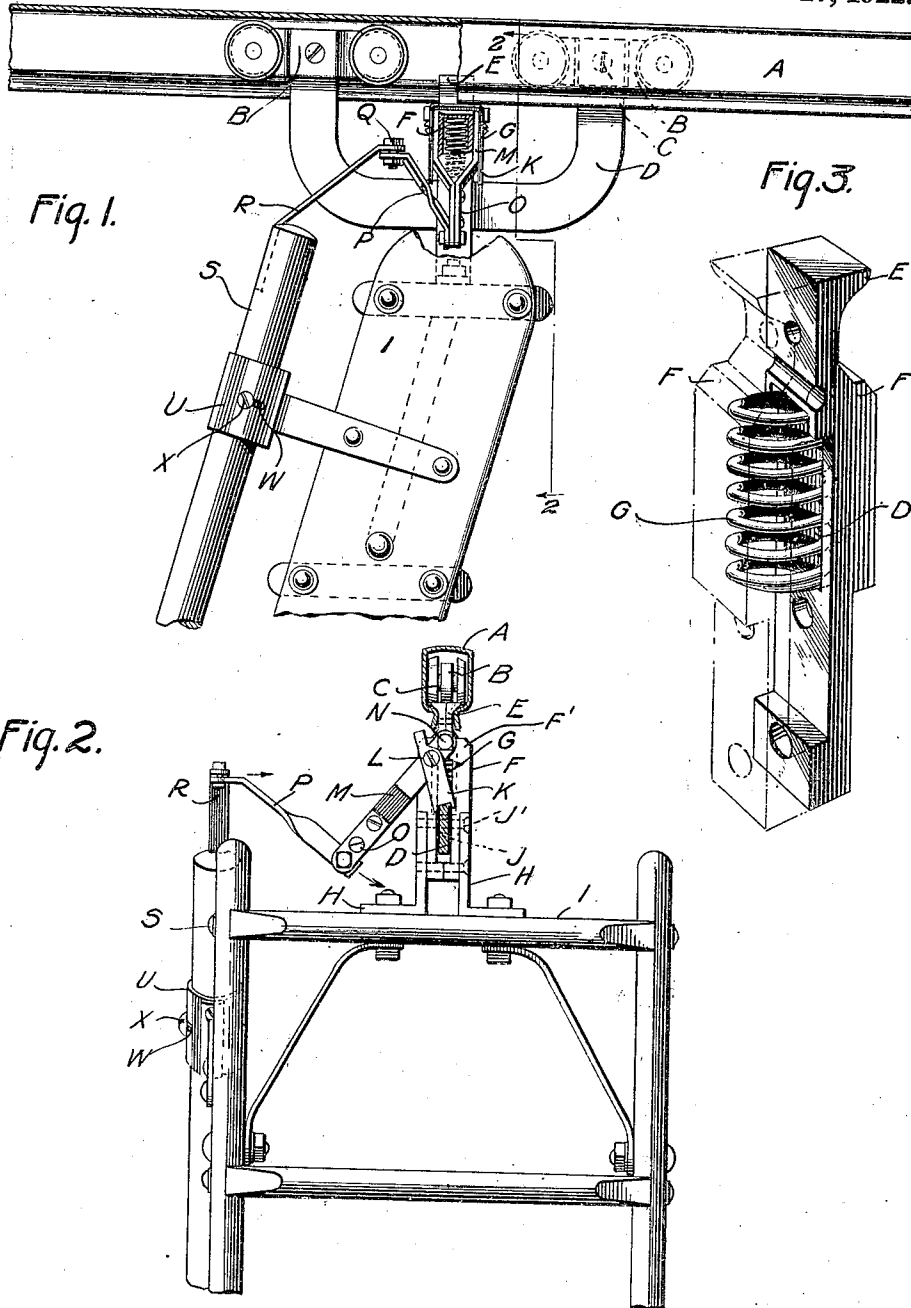


1,431,921.

Patented Oct. 17, 1922.



Inventor:
 Harry F. Barnes.

by

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UNITED STATES PATENT OFFICE.

HARRY F. BARNES, OF ORANGE, NEW JERSEY, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

BRAKE FOR ROLLING LADDERS.

Application filed December 11, 1920. Serial No. 430,006.

To all whom it may concern:

Be it known that I, HARRY F. BARNES, residing at Orange, in the county of Essex and State of New Jersey, have invented certain Improvements in Brakes for Rolling Ladders, of which the following is a specification.

This invention relates to new and useful improvements in rolling ladders and more particularly to that class of rolling ladders which are suspended from an overhead track and are used in telephone exchanges, stores and the like where it is necessary to have ready access to machine parts and shelves normally out of reach. The primary object of the invention is to provide a ladder of this type having a brake which is automatically applied by the weight of a person using the ladder and also automatically released upon the removal of said weight. It further relates to a manually operative means for releasing the brake to permit a person using the ladder to move the same from place to place without first having to descend.

More specifically, the invention consists in the combination with a track, a truck movable on the track and a ladder depending therefrom, of a locking member or brake which serves to secure the truck against movement on the track which is actuated by a limited downward movement of the ladder, the brake being held in the released or inoperative position by a spring or other means acting to counterbalance the weight of the ladder when it is not in use.

To these and other ends the invention consists in certain combinations of parts as will be more fully described hereinafter, all the novel features being pointed out in the claims appearing at the end of the specification.

In the drawings,

Fig. 1 is a view showing in side elevation the upper portion of a ladder structure illustrating a proposed embodiment of my invention;

Fig. 2 is a front elevation taken along line 2—2 of Fig. 1.

Fig. 3 is a detail perspective view of one of the sections comprising the locking member.

Similar reference letters in the several figures indicate similar parts.

In carrying out my present invention, the ladder is supported at its upper end, or sus-

pended, from a truck movable along an overhead track which, it will be understood may be mounted on brackets or other suitable supports. In the illustration, the track, indicated by A, is shown as being of tubular form and slotted along its lower side forming a passage for the depending yoke D of the truck which is preferably provided with pairs of supporting rollers or carriages B, B to which the yoke is attached by bolts C. The pairs of rollers are separated sufficiently to accommodate the locking or brake member which is interposed relatively thereto and serves to secure the truck against movement.

The braking member is adapted to be automatically operated whenever weight is applied to the ladder, as by a person stepping thereon, and to this end it is movably mounted on the truck so as to have a limited vertical movement. The ladder is directly attached to the braking member, the weight of the ladder being counterbalanced so that when it is not occupied or the weight is removed therefrom, the brake is released, thus allowing the truck to be easily shifted along the track.

In the drawings, the ladder I is shown suspended from the locking member F by means of suitable brackets H. These members fastened together in this fashion are yieldingly supported on the yoke D so as to allow a limited movement relatively thereto. This yielding attachment is shown as being obtained through the action of a resilient element cooperating with the yoke and by means of an elongated slot J in the yoke D which serves as a guide for the bolt J', passing through the member F and the yoke, serving also to prevent longitudinal movement of the locking member F on the yoke.

The locking member is supported for a limited vertical movement on the yoke and to this end it is composed of two similar sections F' embracing opposite sides of the yoke bar D and provided with a recess D' enclosing an expansible coil spring G which rests upon the upper edge of yoke bar D and serves to normally hold the locking member F elevated. This spring is sufficiently strong to counteract the weight of the ladder.

From this construction, the mode of operation of the brake will be readily understood. When a weight is placed upon the

ladder, both the ladder and the braking member F are moved downward as far as the slot and pin connection (J and J') will allow. This movement forces the wedge shaped braking head E into engagement with the inner surface of the track and secures the ladder against movement. When the weight is removed from the ladder the spring G which was compressed as a result of the downward movement of the ladder lifts the ladder forcing the braking member upward to the opposite limit of the before-mentioned slot and pin connection and simultaneously moves the head E out of engagement with the track.

Means are provided for releasing the brake when the ladder is weighted comprising a hand rail which is supported to allow it a limited movement which may be utilized to release the locking member by lifting the ladder with the weight of the occupant. In the illustrations I have shown the hand rail S as journaled in suitable bearing brackets U and cooperating with the truck and brake by suitable operating connections such as a series of toggle levers K, M and P. The lever K is U-shaped and at the lower ends of its side pieces engages the upper edge of the yoke D at opposite sides of the locking member as shown in Fig. 1. The lever M is bifurcated and its two arms are pivoted to the lever K at the point L and to the locking member as indicated at N, whereby when the outer end of the lever is moved downwardly the locking member and the ladder attached thereto will be elevated sufficiently to release the brake shoe E. Attachment between the lever M and the hand rail S is effected by a link P and an angularly disposed lever arm R, the amplitude of movement of which is limited by the oscillation of the hand rail which is governed by the screw X in the slot W of the supporting bracket U.

A person desiring to release the brake while occupying the ladder uses the manual release for this purpose. A twist of the handrail S is transmitted over the lever system P, M and K as indicated by the arrows in Fig. 2. The action of the lever M lifts the ladder using the yoke D as a fulcrum, thus disengaging the brake head E from the track.

What is claimed is:

1. The combination with an overhead track and a truck movable thereon, of a ladder carried by the truck and a brake actuated by a weight placed upon the ladder.

2. The combination with an overhead track and a truck, movable thereon of a ladder having a limited movement on the truck, a brake movable into and out of engagement with the track by the movement of the ladder and means normally tending to disengage said brake from the track.

3. The combination with an overhead track and a truck movable thereon, of a brake serving to secure the truck against movement, a ladder attached to said brake and means for moving the ladder to release the brake.

4. The combination with an overhead track and a truck movable thereon, of a locking member serving to secure the truck against movement and a ladder having a limited movement on the truck to actuate said locking member.

5. The combination with an overhead track and a truck movable thereon, of a braking member serving to secure the truck against movement and having a movement on the truck, a ladder cooperating with the braking member and tending to actuate it and means for counterbalancing the weight of the ladder.

6. The combination with an overhead track and a carriage thereon, of a ladder suspended below the carriage and having a limited movement relative thereto and a locking member cooperating with and movable into and out of engagement with the track by the movement of the ladder on the carriage.

7. The combination with a track, a carriage and a ladder suspended beneath said carriage and having a limited movement relatively thereto, of a brake attached to the ladder and cooperating with the track upon the downward movement of the ladder on the carriage.

8. The combination with an overhead track, a truck movable thereon having spaced supporting rollers, and a ladder, of a brake member supporting the ladder arranged to have a limited movement on the truck between the rollers and to engage the track when weight is placed upon the ladder.

9. The combination with an overhead track, a truck movable thereon, a locking member mounted on the truck and movable into and out of engagement with the track, a ladder suspended on said member and means for normally counterbalancing the weight of the ladder serving to hold the locking member out of engagement with the track.

10. The combination with an overhead track, a truck movable on said track, and a ladder on said truck, of a brake attached to the ladder and operating to secure the truck against movement when the ladder is weighted, means for normally holding the brake in an inoperative position and means for releasing the brake while the ladder is weighted.

11. The combination with an overhead track, a truck movable on said track, having spaced roller carriages, and a ladder supported and movable vertically on said truck, of a locking member cooperating with the

track between said carriages, and resilient means counterbalancing the ladder and operating to hold the brake in a normally inoperative position.

5 12. The combination with an overhead track, a truck thereon, of a brake on the truck cooperating with the track and a ladder depending from said brake and movable relatively to the truck to lock the ladder
10 when the same is weighted and a compression spring counteracting the weight of the empty ladder to release the brake.

13. The combination with an overhead track and a depending truck member longitudinally movable thereon, of a locking device on said member cooperating with the track, and a ladder depending from said locking device and supported for independent movement on the depending truck member.
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14. The combination with an overhead track and a truck movable thereon, of a ladder, a braking member fastened thereto, said braking member cooperating with the track
25 and having a limited movement on said truck; a lever system operating on the truck and the braking member for disengaging the latter from the track.

15. The combination with an overhead track and a truck movable thereon having a depending yoke portion, of a member, serving to lock the truck, comprising two sections located at opposite sides of the yoke and arranged to have a limited vertical
30 movement thereon, a ladder attached to said member and means cooperating with the yoke and member serving normally to counter-balance the weight of the ladder.

16. The combination with an overhead track and a truck movable thereon having a depending yoke portion, of a member for locking the truck comprising two corresponding portions straddling the yoke and provided with an elongated recess affording a
45 limited vertical movement of the member on the yoke, a spring enclosed between said portions of the member serving to yieldingly support it and a ladder attached to said member.

50 17. The combination with a tubular slotted track, a truck therein having a depending yoke spaced below the track, of a braking

member comprising two corresponding sections located at opposite sides of the yoke and having elongated recesses allowing a
55 limited movement of the member on the yoke, said sections at their upper ends extending into the track slot and being provided with inclined surfaces adapted to engage the proximate edges of the track slot,
60 means acting to normally hold the brake member in inoperative position and a ladder attached to said member.

18. The combination with an overhead track, a truck thereon and a ladder carried
65 by the truck, of a member for locking the truck, a hand rail mounted for oscillatory movement on the ladder and operating connections between said rail and member for releasing the latter.
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19. The combination with an overhead track, a truck thereon and a braking member serving to secure the truck against movement and having a limited movement thereon, of a ladder attached to the braking member and normally tending to actuate it, a
75 hand rail movably mounted on the ladder and connections between it and the brake for releasing the latter.

20. The combination with an overhead track, a truck thereon, and a braking member serving to secure the truck against movement and having a limited movement thereon, of a ladder attached to the braking member and normally tending to actuate
80 it, of an oscillatory hand rail, and means operated by the rotary movement of the latter to raise the ladder and release said brake.
85

21. The combination with an overhead track, a truck movable thereon, a locking member for securing the truck against movement on said track, a ladder depending from said truck and having a limited movement thereon, of an oscillatory hand rail and a
90 toggle lever connection between the truck and the hand rail operating to release said locking member when the rail is rotated in one direction.

In testimony whereof, I have signed my
100 name to this specification this 7th day of December, 1920.

HARRY F. BARNES.