

E. DENNIS.
 LADDER GRIPPING ATTACHMENT FOR SHOES.
 APPLICATION FILED MAR. 22, 1911.

1,059,284.

Patented Apr. 15, 1913.

2 SHEETS—SHEET 1.

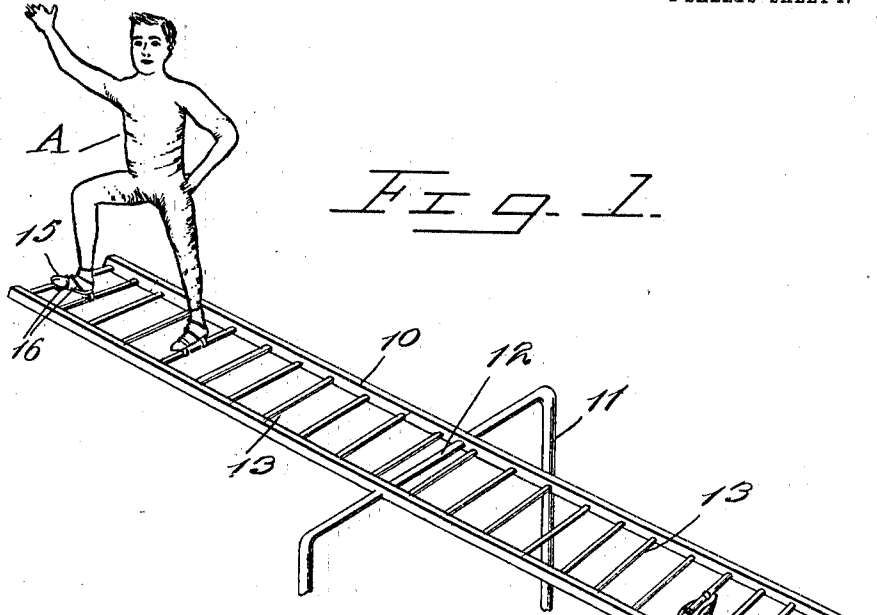


Fig. 1.

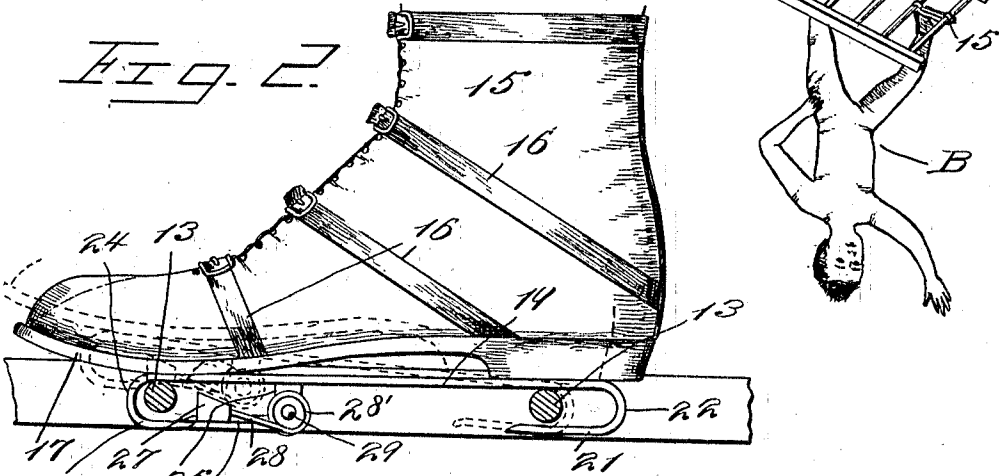


Fig. 2.

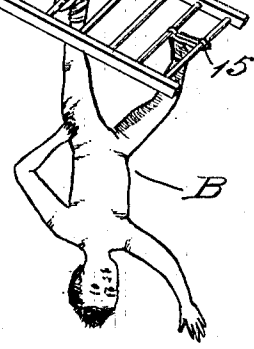


Fig. 3.

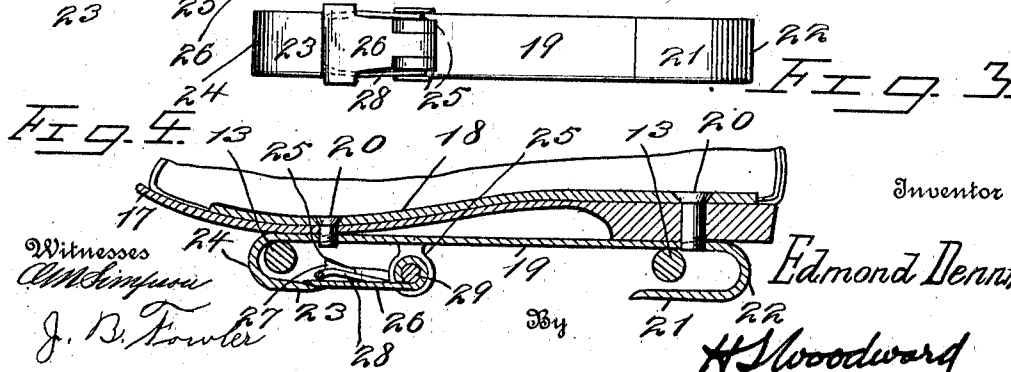


Fig. 4.

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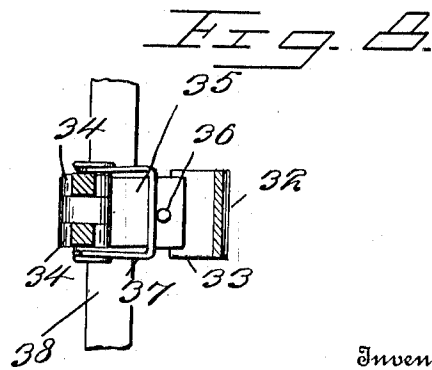
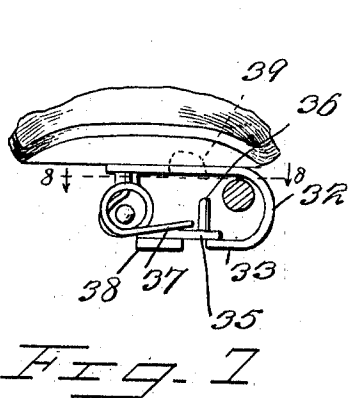
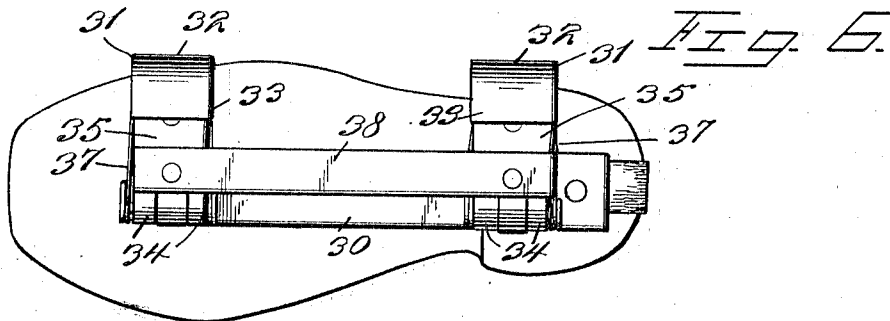
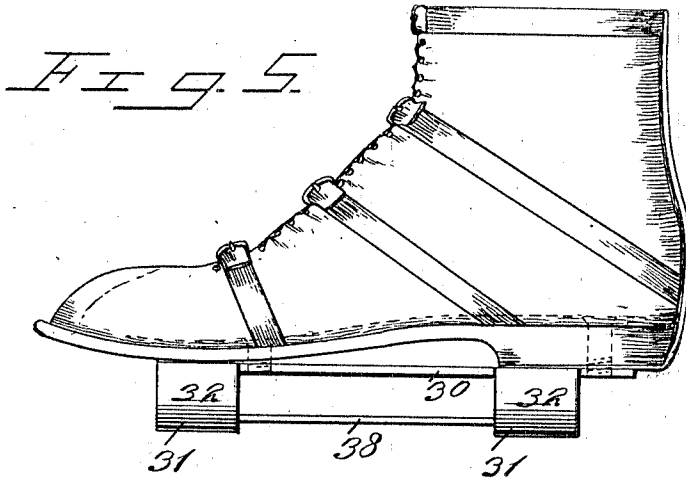
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UNITED STATES PATENT OFFICE.

EDMOND DENNIS, OF FALL RIVER, MASSACHUSETTS.

LADDER-GRIPPING ATTACHMENT FOR SHOES.

1,059,284.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed March 22, 1911. Serial No. 616,205.

To all whom it may concern:

Be it known that I, EDMOND DENNIS, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented new and useful Improvements in Ladder-Gripping Attachments for Shoes, of which the following is a specification.

This invention relates to theatrical appliances, and more particularly to devices for use in aerial athletic exhibitions.

It has for its object to provide a shoe and appliances thereon enabling the wearer to stand upon a ladder or other support with his body inclined in an unbalanced position and to retain the same relative position to the ladder as when standing upright, even when the body of the wearer is inverted and extended downward from the support, the feet of the wearer at all times appearing to rest upon the side of the support adjacent to him.

An important object of the invention is to provide a device to be secured beneath the foot of the wearer, whereby the foot may be secured to a support without the application of any tool or implement, and without necessity for manipulation, and which will operate automatically when the foot is presented to the support in a proper manner.

The present device was evolved for the accomplishment of the above stated objects, and other purposes may be apparent from the following description and from the drawings, in which,

Figure 1 is a perspective view of a ladder mounted for rotation, with two performers thereon in position for rotation, Fig. 2 is a side view of the shoe and attachments for the right foot, in engaged position, Fig. 3 is a bottom view of the attachment detached from the shoe, Fig. 4 is a longitudinal vertical section of the device in use, Fig. 5, is a side view of the equipment for the left foot, Fig. 6 is a bottom view thereof, Fig. 7 is a front view thereof in use, Fig. 8 is a fragmentary detail of the securing device on the left shoe, on the line 8—8 of Fig. 7.

There is shown a ladder 10 carried upon a suitable frame 11, having the transverse shaft 12 engaged revolubly with the ladder. The ladder has a multiplicity of rungs 13, spaced as desired, but preferably at a distance which will bring two adjacent rungs

within the length of a good sized shoe, though this spacing is not essential throughout the ladder. At one end of the ladder stands a performer A, and suspended from the opposite end of the ladder there is a second performer B, both secured in the manner to be described. Upon the right foot of each performer there is engaged a shoe 15, which may be of approximately the usual construction, reinforced by strengthening means, such as the straps 16, secured to or extending beneath the sole 17 of the shoe, and co-engaged over the upper portion of the shoe in a suitable manner. The shoe is perforated centrally of the heel and centrally of the forward sole portion, a suitable anchor plate 18 being disposed within the shoe, the anchor plate having countersunk apertures registered with the openings of the bottom of the shoe. This plate should preferably conform to the shape of the sole, for the comfort of the wearer. A flat strip 19 of heavy sheet metal is engaged beneath the sole of the shoe, having threaded apertures therethrough registered with respective openings through the bottom of the shoe, suitable securing screws 20 being engaged through the anchor plate and the bottom of the shoe and screwed home in the threaded apertures in the strip 19. The latter plate may be termed a hook plate, its rear end being curved inwardly to form an elongated bill 21 extending parallel with the adjacent inner portion of the plate, its bight portion 22 being curved, as shown, for snug engagement with a ladder rung at times. The extremity of the bill 21 may be turned slightly outward to facilitate the entrance of a rung thereunder, as will be subsequently described. The forward end of the plate 19 is similarly curved inward to form a bill 23 a little less than half the length of the bill 21, the respective bight portion being also curved for the reception of a ladder rung. It should be noted that the rear hook is somewhat lighter than the one in front, that is to say, the metal is made thinner intermediately of the bill at the rear end, or the forward bill thickened, for a purpose to be subsequently described. Two ears 25 are carried at each side of the plate, spaced a proper distance from the bill 23, and pivoted therebetween is a keeper member 26 extending forwardly and inwardly of the tip of the bill 23 and having

check lugs 27 formed a spaced distance from the bight 24, whereby a ladder rung may be held snugly between the lugs and bight of the hook at times. The lugs are arranged to project past each side of the plate when the keeper is depressed thereagainst, and the ears 25 supporting the keeper are of such a length that when depressed the keeper will be inclined toward the plate at such an angle that when the device is pressed downwardly upon a ladder rung the inclined keeper will force the rung forwardly into the forward hook. A spring member 28 is engaged between the plate and the keeper to hold the keeper in closed position against the bill 23, yieldably for inclination as described. The spring 28 comprises a single piece of wire bent into U-shape, a helix 28' being formed intermediately in each arm, the extremity of the wire being extended a slight distance beyond the helix and engaged against the plate 19, in a forwardly direction, the bight portion of the spring being engaged against the inner face of the keeper 26. The helices of the spring are engaged upon the pivot member 29 holding the keeper 26 in place.

The right foot equipped as described is disposed outwardly of the performer upon the rotating ladder. As each performer ascends with rotation of the ladder, he sways his body inward toward the axis of rotation so that his body will resist less the upward movement of the adjacent arm of the ladder through the action of gravity. Upon reaching the zenith of this movement, the body is swayed outward farther from the axis of rotation of the ladder and an unbalanced force is produced under the action of gravity, acting in the direction of rotation. When the weight of the performer is added to the strain of centrifugal force as the respective end of the ladder moves downward, the resultant force applied through this foot is greater than that exerted through the inner foot at any time. The safety of the performer is thus greatly increased by making it possible to support the outer foot upon two rungs of the ladder.

Figs. 5 to 8 inclusive illustrate the left foot equipment, which for the comfort of the performer and for the reason that this device sustains less strain than the first described one, is arranged to extend transversely of the ladder, and engage but one rung thereof. The shoe and reinforcing means shown in these figures may be the same as that first described, and though the upper portion of this shoe in normal use sustains a greater tensile strain than the other, it is advisable to have the other equally strong to take a similar strain in case this device fails in its function for any reason, as has happened in use on at least one occasion. This left foot device includes

an anchor plate similar to the one described and engaged with the shoe and an exterior hook plate 30 in the same manner as first described. The hook plate in this device is provided with two hooks 31, extending laterally therefrom toward the outer side of the shoe, and including the bight portions 32 and bills 33. These hooks are preferably spaced adjacent the ball and heel receiving portions of the shoe. They may be formed integrally with the plate 30, by stamping or otherwise, if desired, or may be formed of separate pieces of metal secured to the plate. Formed on the opposite side of the plate from the hooks there are respective pairs of ears 34, between which are pivoted keepers 35 lying within the bills 33 at their ends and having stop lugs 36 and being engaged by springs 37, these elements and the bight 32 all having the same functional relation as the parts 23 to 28 inclusive above described. These two keepers are connected in rigid relation by the longitudinal bar 38. In this form of the device the springs are shown with their end portions engaged in suitable perforations in the plate 30 rather than being supported by the keeper pivots, and the lugs 36 are located intermediately of the keepers, suitable openings being formed at 39 through the hook portions and the shoe sole for their reception.

It will be seen that in use the entrances to the hooks will be presented to the outer end of the ladder, with the left foot in the natural position which it tends to assume when the right foot is extended outwardly of the other and longitudinally of the ladder.

In use, the right foot is presented downwardly to engage one rung of the ladder transversely of the plate 19 and forwardly of the bill 21, the foot being slipped forwardly until the rung is engaged against the bight 22, when, by pressing the toe downwardly, an outer rung will be brought against the keeper 26, which in yielding allows entrance of the rung to the forward hook and presents an inclined face which acts as a fender to force the rung forwardly, the foot thus being moved rearwardly until the keeper 26 is freed to move into closed position, the inner rung being moved slightly toward the outer end of the bill 21, but not being disengaged therefrom. The foot is thus securely held upon the two rungs and may be released by pressing the keeper 26 inward and moving the foot forward until the forward rung is disengaged, then moving it rearwardly until the rear or inner rung is clear of the bill 21.

The left foot is secured by one diagonal movement of the foot outwardly and downwardly to bring the rung against the keepers 35 and into the hooks 31, its release being effected by pressing against the bar 38 to allow passage of the rung outwardly over

the keepers 35 and moving the foot inwardly of the ladder.

The bill 21 of the right foot device is made weaker than the forward hook 23, in order that, in case the left foot becomes detached or disengaged, when the body of the performer flies outward by reason of the high speed usually attained, the heel of his right foot will not be held by the bill 21 so forcibly as to injure his right limb, but will bend, allowing the foot to pivot on the front hook as engaged with the outer rung, and give the performer an opportunity to grasp the ladder as soon as his momentum has decreased sufficiently.

It will of course be understood that these devices need not be attached to the right and left shoes respectively as described, but the relation may be reversed if desired. It will also be understood that the two forms need not essentially be used together, but that one form may be applied to both feet, if desired, to suit different kinds of performances, but the relation described is preferable for the particular act in which its use is demonstrated in the specification.

What is claimed is:

1. In a device of the class described, the combination with a pair of shoes of support engaging members carried by one shoe and adapted to engage supports extending transversely of the shoe and spaced longitudinally thereof, and support engaging members carried by the other shoe, for engagement with a support member extending longitudinally of the shoe for the purpose described.

2. A device of the class described comprising a plate adapted to be secured to the bottom of a shoe and having one end bent inwardly to form a hook bill in spaced relation with an intermediate portion of the plate, said plate having its opposite end similarly bent to form a shorter bill, and means to close the space beneath the short bill movable yieldably in one direction to allow entrance of a support and adapted to hold it against casual disengagement.

3. A device of the class described adapted for engagement upon the foot of a person, including spring pressed relatively movable elements arranged to yield to a support under inward movement thereof to engaged position therebetween and adapted to coact to

prevent casual disengagement of the support.

4. In a device of the class described, the combination with a shoe, of an elongated hook member and a short hook member in spaced opposed relation with the first, whereby one of two fixedly spaced support members may be positioned in the longer hook during and after engagement of the other support in the short hook.

5. In a device of the class described, the combination with a shoe of relatively movable support engaging members on the sole thereof yieldable to a support for entrance of the support between said members, and arranged and adapted to hold a support against casual disengagement.

6. The combination of a shoe, a hook on the sole thereof adapted to receive a support therein, a keeper adapted to hold a support in the hook and yieldable thereto under pressure, and resilient means to hold the keeper in operative position.

7. The combination of a shoe, an elongated hook upon the bottom, a short hook in spaced opposed relation to the first, and means on the short hook yieldable in one direction to allow a support to enter the hook, and adapted to retain it therein, whereby one of two fixedly spaced supports may be held in the longer hook during and after engagement of the other support in the short hook, and both hooks be held engaged with the respective supports under operation of the means on the short hook.

8. In a device of the class described, a plate, a hook carried thereby having its bill spaced from the plate, and a spring pressed keeper pivoted on an axis spaced longitudinally outward of the bill and from the plate and adapted to engage the inner side of the bill, being yieldable to a support under pressure, and adapted to engage the plate adjacent the bill, whereby when pressed upon a support the latter will be fended into the hook and held.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDMOND DENNIS.

Witnesses:

FRED MARTEL,
BARNET GLUCKMAN.