Oct. 8, 1929. R. LABORDA 1,731,052

CLIMBING DEVICE

Filed Feb. 16, 1927 2 Sheets-Sheet 1

Fig. 2.

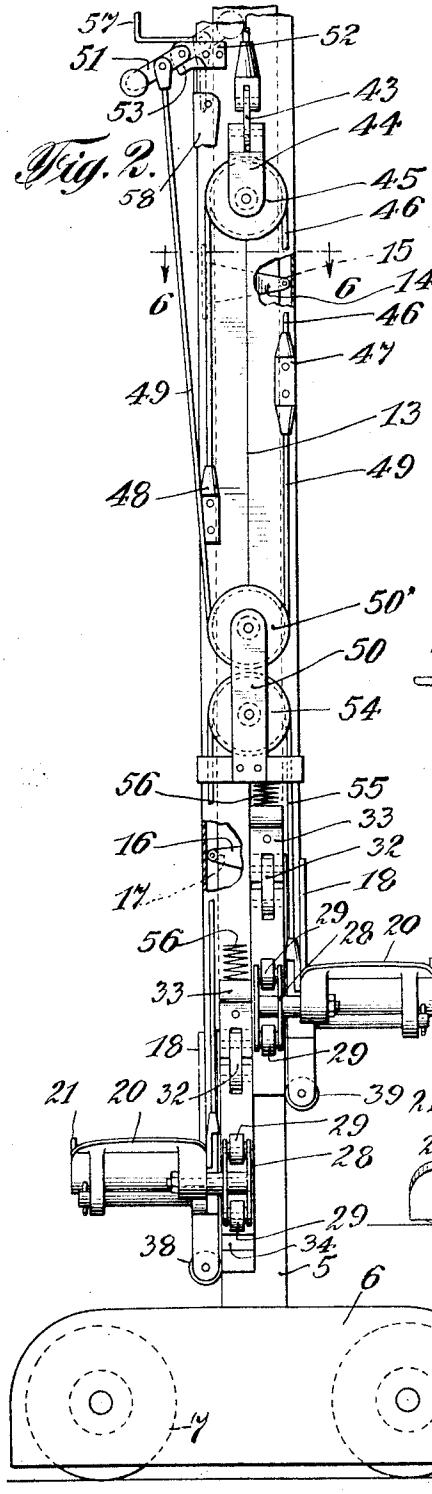


Fig. 1.

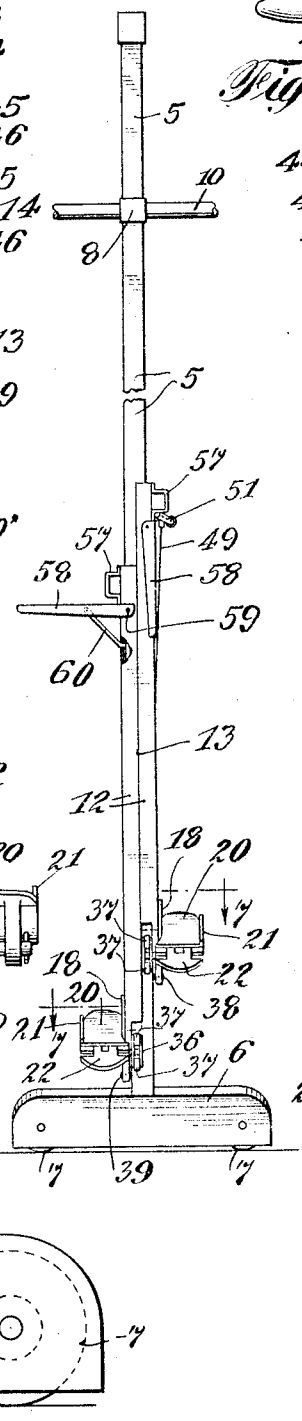
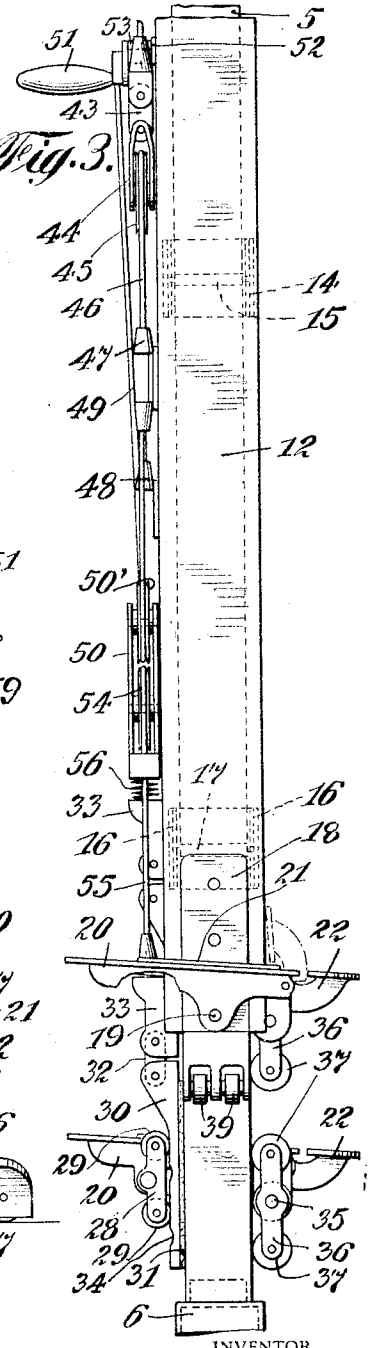


Fig. 3.



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Filed Feb. 16, 1927 2 Sheets-Sheet 2

Fig. 4.

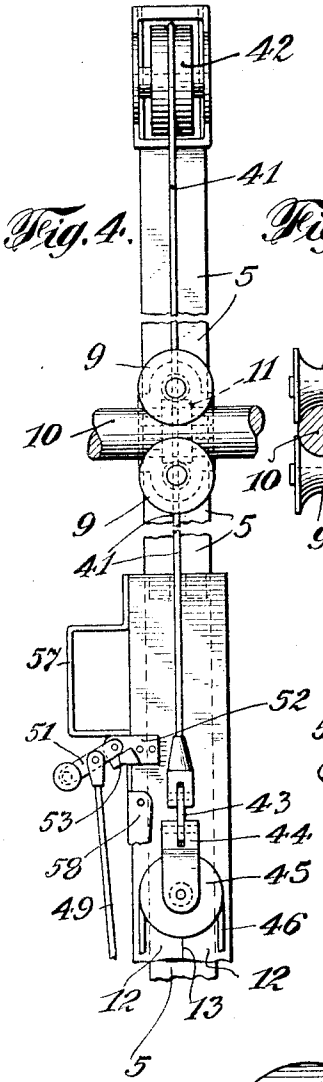


Fig. 5.

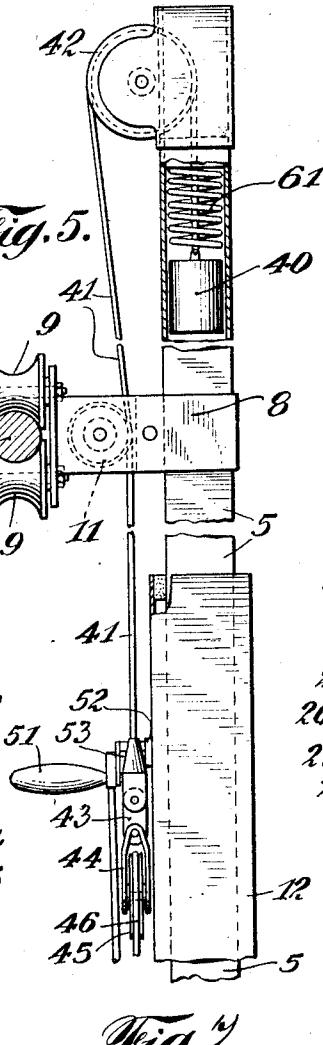


Fig. 6.

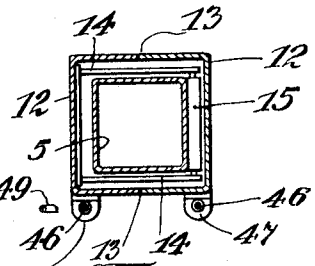


Fig. 9.

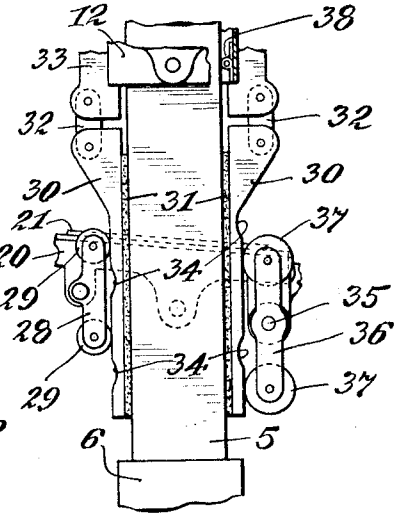


Fig. 7.

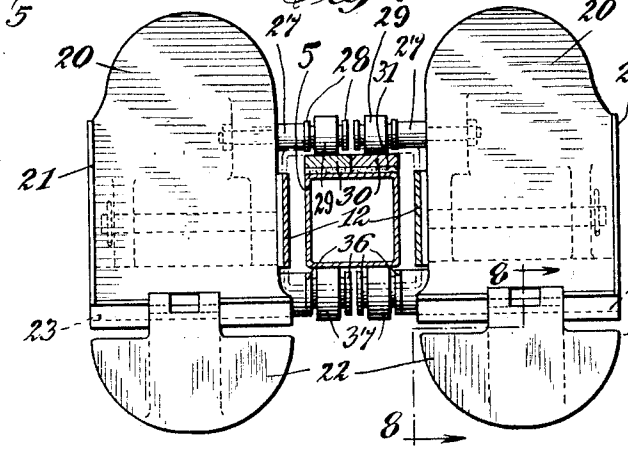
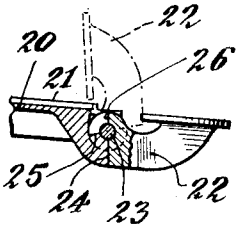


Fig. 8.



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Patented Oct. 8, 1929 1,731,052

UNITED STATES PATENT OFFICE

RICHARD LABORDA, OF BROOKLYN, NEW YORK

CLIMBING DEVICE

Application filed February 16, 1927. Serial No. 168,481.

This invention relates to climbing devices, and has for its primary object to provide certain improvements in the device shown and described in Patent No. 1,585,925, issued to me on May 25, 1926.

It is one of the important objects of the invention to provide a climbing device adapted for use in commercial establishments in place of the usual store ladders which may be operated with great rapidity for the purpose of quickly reaching and removing articles stored upon the higher shelves and which is provided with means automatically acting to insure the absolute safety at all times of the user.

It is one of the detail objects of my invention to provide an improved construction and mounting of the foot pedals or climbing members which are mounted upon opposite sides of the vertical column with improved connecting means between said climbing members and a counterweight or other suitable equivalent means for raising or elevating the climbing members upon the column whereby a step by step movement is imparted to the climbing members as the weight is alternately shifted from one to the other.

Another feature of my present improvements resides in the novel form of friction brake automatically controlled by each climbing member for securely retaining the same in fixed relation to the column under the weight of the operator or user.

Another object of my invention is to provide means in addition to said friction brakes whereby both of the climbing members may be securely held in a stationary position relative to the vertical column regardless of the distribution of the operator's weight thereon.

With the above and other objects in view, the invention consists in the improved climbing device and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have disclosed one simple and practical embodiment of my present improvements and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is a front elevation illustrating one embodiment of my improved climbing device;

Fig. 2 is a rear elevation thereof, the upper end portion of the column being omitted;

Fig. 3 is a side elevation;

Fig. 4 is a rear elevation of the upper part of the device omitted from Fig. 2;

Fig. 5 is a side elevation of the upper portion of the device omitted from Fig. 3;

Fig. 6 is a detail horizontal section taken on the line 6—6 of Fig. 2;

Fig. 7 is a horizontal sectional view taken on the line 7—7 of Fig. 1;

Fig. 8 is a detail section taken on the line 8—8 of Fig. 7, and

Fig. 9 is an enlarged detail elevation showing a modified form of the braking means for one of the climbing members.

Referring in detail to the drawings, 5 designates the tubular metal column, preferably of rectangular form which is suitably mounted and supported at its lower end upon a carriage indicated at 6, the wheels or rollers 7 of which are arranged to travel upon a suitable metal track or wear plate fixed to the floor surface. In spaced relation to the upper end of said column a U-shaped metal bracket 8 is suitably fixed and preferably positioned at right angles to the column, the spaced arms of the bracket extending rearwardly therefrom and supporting upper and lower rollers 9 which are engaged with the upper and lower sides respectively, of a fixed horizontally extending guide rod 10. Between these rollers and the column 5 a guide sheave indicated at 11 is rotatably mounted between the spaced arms of the bracket for a purpose which will be hereinafter disclosed.

At the opposite side portions of the column 10 the elongated longitudinally extending channel shaped members 12 are arranged, each of these members being of U-shaped cross sectional form and the walls thereof laterally spaced from the corresponding walls of the column 5. The front and rear walls of the members 12 are in abutting contact with each other at their longitudinal edges as in-

dicated at 13. To the lateral or side wall of one one of the members 12 and to the inner face thereof the horizontally disposed arms 14 are secured adjacent the upper end of said member and project therefrom between the front and rear walls of the members 12 and the corresponding walls of the member 5. A roller 15 is mounted between the other ends of said arms and has contact upon one of the lateral side walls of the column 5. A similar pair of arms 16 are fixed to the other member 12 adjacent to its lower end and project in the opposite direction with respect to the arms 14 and the roller 17 mounted between the ends of said arms 16 has rolling contact upon the other lateral or side wall of the column 5. Thus the edges 13 of these members 12 are held in contacting engagement with each other and the members prevented from separating laterally and moving out of operative relation to the column 5.

To the side wall of each of the members 12 at its lower end a suitably formed bracket 18 is riveted or otherwise securely fixed and carries a laterally projecting pivot stud or pin 19 upon which the foot pedal or climbing member 20 is oscillatably supported. As herein shown, this climbing member includes a body member to receive the forward portion of the foot which is preferably provided at its outer longitudinal edge with an upstanding flange 21 and a pivoted heel receiving member 22 suitably connected with one end of the member 20 by the pivot pin 23, said member 20 having a stop flange 24 with which a part of the member 22 engages to limit the pivotal movement of said member in one direction to its normal position substantially in the plane of the body member 20, said part 24 and the member 22 also being provided with angularly extending shoulders 25 and 26 respectively which are adapted to contact and limit the swinging movement of part 22 upwardly to an inoperative position as shown in dotted lines in Fig. 8 of the drawings. Thus, these heel portions of the climbing members may be moved from their protruding position into close relation with the members 12 so that they will not obstruct the passageway between the store counters and the wall.

To the other or forward end of each of the body members 20 an inwardly projecting pivot stud 27 is fixed and upon the same the spaced vertically positioned bars 28 are loosely mounted intermediate of their ends. Between the upper and lower ends of these spaced bars 28, the rollers 29 are journalled and are adapted for rolling contact upon the outer side of a brake shoe 30 lined with friction material 31 which is adapted to engage the rear side wall of the column 5 below the corresponding wall of the member 12. The upper end of the brake shoe 30 is connected by a link 32 with the bifurcated lug 33 which is fixed to the lower end of the member 12. The outer side face of the brake shoe 30 is provided at vertically spaced points with the cavities or recesses 34 which are adapted to receive the respective upper and lower rollers 29 in the oscillating movement of the climbing member in one direction to thereby relieve the frictional pressure of the brake shoe against the side wall of the column and thus permit of the free vertical movement of the climbing member and the member 12 relative to said column. When however, the climbing member is rocked in the opposite direction to move the rollers 29 out of the recesses or cavities 34 to substantially the position shown in Fig. 3 of the drawings, it will be apparent that the brake shoe 30 is forced inwardly to cause the lining 31 thereof to exert a frictional braking pressure against the wall of the column, thereby securely holding the climbing member against shifting movement relative to the column.

At the opposite side of the column 5, the member 20 of each climbing device is also provided with an inwardly extending pivot stud 35 upon which spaced vertically positioned bars 36 are pivoted intermediate of their ends, rollers 37 being mounted in the upper and lower ends of said bars and contacting directly with the side wall of the column 5. However if desired, as shown in Fig. 9 of the drawings, I may also provide at this side of the column an additional brake shoe for each of the climbing members, substantially of the same construction as above described. Further, as shown in this figure, I may provide the side walls of the members 12 at their lower ends with suitable anti-friction rollers 38 mounted upon the inner faces thereof for contact with the side walls of the column.

The brackets 18 are also preferably provided with parts extending downwardly below the respective members 12 and in which additional anti-friction rollers 39 are mounted for engagement with the opposite side faces of the column. Thus the greatest ease and freedom of movement of the climbing members and the members 12 will be obtained.

A counterweight 40 is vertically movable within the column 5 and the cable or other flexible element 41 connected with this counterweight is trained over a sheave or pulley 42 suitably journalled upon the rear side of the column 5 at its upper end, said cable extending downwardly over the front side of the guide sheave 11 mounted in the bracket 8 and having its lower end connected by the link 43 with the hanger 44 in which a sheave or pulley 45 is journalled. A second cable or flexible element 46 extends around the upper part of this sheave 45, one end thereof being suitably secured to a bracket member 47 fixed to the rear side wall of one of the members 12, while the other end of said cable is connected

with a similar bracket 48 secured to the corresponding wall of the other member 12. A third cable or flexible element 49 is connected at one of its ends with the bracket 47 and is trained around the pulley or sheave 50′ mounted in the upper end of a frame 50 which is free to move vertically relative to the members 12 and the column. The cable 49 extends upwardly from the sheave 50′ and has its other end pivotally connected to a lever 51 at a point intermediate of its ends, one end of said lever being pivotally connected to a bracket 52 fixed to the rear side of one of the members 12. The pivotal movement of said lever in each direction is limited by a shoulder 53 formed on said bracket.

In the frame 50 a second guide pulley or sheave 54 is mounted and a fourth cable or flexible element 55 is engaged with this sheave, one end of this cable being suitably attached or connected to the part 20 of one of the climbing members adjacent its forward end, and the other end of said cable being similarly connected to the other climbing member.

At the upper end of each bracket 33 I preferably provide a compression spring 56 which is adapted to contact with the lower end of the frame 50 and yieldingly limit the upward movement of each climbing member and the member 12 with respect to said frame.

I also preferably provide at the upper end of each of the members 12, a suitably formed handhold 57 and below said bracket member a suitable collapsible bracket or shelf 58 is pivotally connected with the member 12 at one of its ends as indicated at 59. A supporting rod or brace 60 for said bracket is pivoted at one end to the bracket and the other end thereof is adapted to be fitted into an opening or engaged with other suitable means on the member 12 to sustain said bracket in a horizontally projecting position as shown at the left hand side of the drawings in Fig. 1. This bracket or shelf provides a convenient means upon which the desired articles may be piled and supported.

From the foregoing description, the several new features of my improved climbing device will be fully understood. The feet of the operator are firmly placed upon the two climbing members at opposite sides of the column and when the weight is placed upon one foot and the forward end of the foot tilted downwardly, the brake shoe 30 of the climbing member will be caused to firmly engage the wall of the column 5. At the same time, the other foot is lifted, and the counterweight 40 moving downwardly within the column, through the several cable and pulley connections with the said member, will obviously move the same upwardly together with the member 12 to which it is connected while the other member 12 remains stationary. By alternately shifting the weight from one foot to the other in this manner, a step by step upward movement is obtained until the operator has reached the desired elevation. In order to descend, the operation of the pedals is reversed and they are alternately forced downwardly under the weight of the operator. The upward movement of the counterweight 40 is preferably yieldingly cushioned by means of the spring 61 arranged within the upper end of the column 5.

It is also possible to hold the two pedals ator may stand in an upright position thereon by swinging the lever 51 from the position shown in full lines in Fig. 2 to the dotted line position whereby the point of connection of the cable 49 to said lever is disposed inwardly of the pivot 53 of the lever and pull on the cable through said lever lifts pulleys 50′ and 54 and tilts the pedals 20 so as to apply the brakes. There is thus provided a means for operating the brakes 30 independently of foot pressure on the pedals to fixedly lock the climbing mechanism in a stationary position on the column 5.

In the foregoing description and the accompanying drawings, I have illustrated a practical embodiment of the invention which has given excellent results in practice. However, it is to be understood that the several novel features of my disclosure might also be embodied in various other alternative mechanical forms, and I accordingly reserve the privilege of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. In a climbing device, a supporting column, two members movable along said column, a foot pedal pivotally mounted upon each of said members, means connected with said members and operatively controlled by the foot pedals for imparting a step by step movement to said members alternately along said column, a brake shoe pivotally connected to each of said members and opposed to one side of the column, and means operated by each pedal and bearing against the respective brake shoe upon oscillatory movement of the pedal in one direction.

2. In a climbing device, a supporting column, two members movable along said column, a foot pedal pivotally mounted upon each of said members, means connected with said members and operatively controlled by the foot pedals for imparting a step by step movement to said members alternately along said column, a brake shoe pivotally connected to each of said members and opposed to one side of the column, a pair of vertically spaced rollers carried by each pedal to travel upon one face of the brake shoe and adapted to hold said brake shoe in frictional braking engagement with the wall of the column and said face of the brake shoe being provided with

spaced recesses to receive said rollers to permit of the pivotal movement of the shoe out of braking engagement with the column.

3. In a climbing device, a supporting column, a pair of independently movable members extending longitudinally of the column, a foot pedal pivotally mounted upon the lower end of each of said members, means operatively controlled by said foot pedals for imparting an alternate step by step movement to said members, and each of said foot pedals including a body section and a heel section pivotally connected thereto and movable into and out of extended relation to the body section of the pedal.

4. In a climbing device, a supporting column, longitudinally extending channel shaped members embracing and entirely closing said column and having their walls spaced from the corresponding walls of the column, antifriction means carried by each of said members slidably cooperating with the column to hold the opposed edges of the channel flanges in contact with each other, a foot pedal pivotally mounted upon the lower end of each of said members, and means controlled by said foot pedals for imparting an alternate step by step movement to said channel members along the column.

5. In a climbing device, a supporting column, longitudinally extending channel shaped members embracing and entirely closing said column and having their walls spaced from the corresponding walls of the column, means carried by each of said members slidably cooperating with the column to hold the opposed edges of the channel flanges in contact with each other, a foot pedal pivotally mounted upon the lower end of each of said members, a vertically movable frame, relatively movable flexible connections between said channel members and the frame and between said frame and the foot pedals, and additional means operatively connected with said members adapted to impart an alternate step by step movement thereto along the column upon the operation of said pedals.

6. In a climbing device, a supporting column, two channel members embracing said column and completely enclosing the same, means for retaining said channel members in assembled relation to the column with the opposed edges of the channel flanges in sliding contact with each other, a foot pedal pivotally mounted upon the lower end of each of the channel members, a brake device associated with each foot pedal and cooperating with the wall of the column operated by a tilting movement of the pedal, a vertically movable frame, a pair of pulleys mounted in said frame, a flexible element movable around one of the pulleys and connected at its ends with the respective channel members, a second flexible element movable around the other pulley and connected at its ends with the respective pedals, and additional means operatively connected with the channel members and controlled by the operation of said pedals to impart an alternate step by step movement to said members along the column.

7. In a climbing device, a supporting column, two channel members embracing said column and completely enclosing the same, means for retaining said channel members in assembled relation to the column with the opposed edges of the channel flanges in sliding contact with each other, a foot pedal pivotally mounted upon the lower end of each of the channel members, a brake device associated with each foot pedal and cooperating with the wall of the column operated by a tilting movement of the pedal, a vertically movable frame, a pair of pulleys mounted in said frame, a flexible element movable around one of the pulleys and connected at its ends with the respective channel members, a second flexible element movable around the other pulley and connected at its ends with the respective pedals, a counterweight within said column, a pulley and a flexible connection between said pulley and the counterweight, and a flexible element engaged around said pulley and connected at its opposite ends to the respective channel members to impart an alternate step by step movement to said members in the operation of the pedals.

8. In a climbing device, a supporting column, two channel members embracing said column and completely enclosing the same, means for retaining said channel members in assembled relation to the column with the opposed edges of the channel flanges in sliding contact with each other, a foot pedal pivotally mounted upon the lower end of each of the channel members, a brake device associated with each foot pedal and cooperating with the wall of the column operated by a tilting movement of the pedal, a vertically movable frame, a pair of pulleys mounted in said frame, a flexible element movable around one of said pulleys and connected at one of its ends to one of the channel members, a lever pivotally mounted at one end upon one of the channel members, the other end of said flexible element being connected to said lever in spaced relation to the pivot thereof, said lever being operable to adjust said flexible element and move the frame vertically to thereby simultaneously tilt the pedals and lock said brake devices in braking engagement with the column, a second flexible element movable around the other pulley and connected at its ends with the respective pedals, and additional means operatively connected with the channel members and controlled by the operation of said pedals to impart an alternate step by step movement to said members along the column.

9. In a climbing device, a supporting column, two members movable along said col-

umn, a foot pedal pivotally mounted upon each of said members, means connected with said members and operatively controlled by the foot pedals for imparting a step by step movement to said members alternately along said column, a brake shoe pivotally connected to each of said members and opposed to one side of the column, means carried by the pedals engaged respectively directly with the brake shoes for moving the same into braking engagement with the column upon tilting movement of the pedal in one direction under foot pressure, and additional hand operated means connected with the foot pedals for simultaneously tilting the same and holding the brakes in applied position independently of foot pressure upon said pedals.

10. In a climbing device, a supporting column, two members movable along said column, a foot pedal pivotally mounted upon each of said members, a vertically movable frame, relatively movable flexible connections between said members and the frame and between said frame and the foot pedals, means operatively connected with said members to impart an alternate step by step movement thereto along the column upon the operation of said pedals, a brake shoe connected to each of said members and opposed to one side of the column, means carried by each pedal directly coacting with the respective brake shoes to urge the same into braking engagement with the column upon tilting movement of the pedal in one direction under foot pressure, and hand operated means for adjusting said flexible connection between said frame and the members to move said frame relative to said members and simultaneously tilt the pedals to lock the brake shoes in their effective braking positions.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

RICHARD LABORDA.