

Nov. 11, 1930.

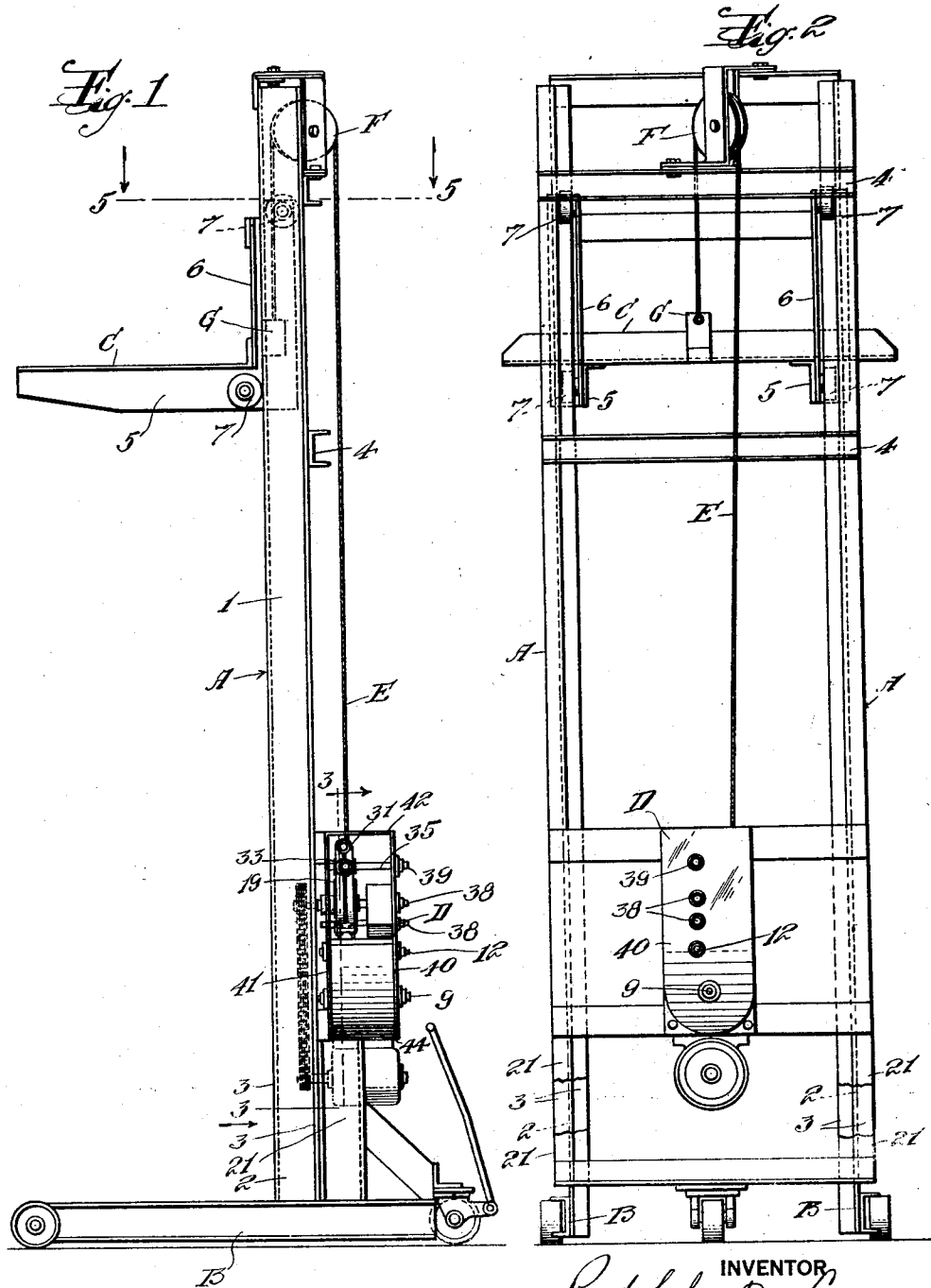
R. DE LAMAR

1,781,104

PORTABLE ELEVATOR

Filed April 10, 1928

2 Sheets-Sheet 1



INVENTOR  
Rudolph De Lamar,  
BY  
E. W. Hucock,  
ATTORNEYS

Nov. 11, 1930.

R. DE LAMAR

1,781,104

PORTABLE ELEVATOR

Filed April 10, 1928

2 Sheets-Sheet 2

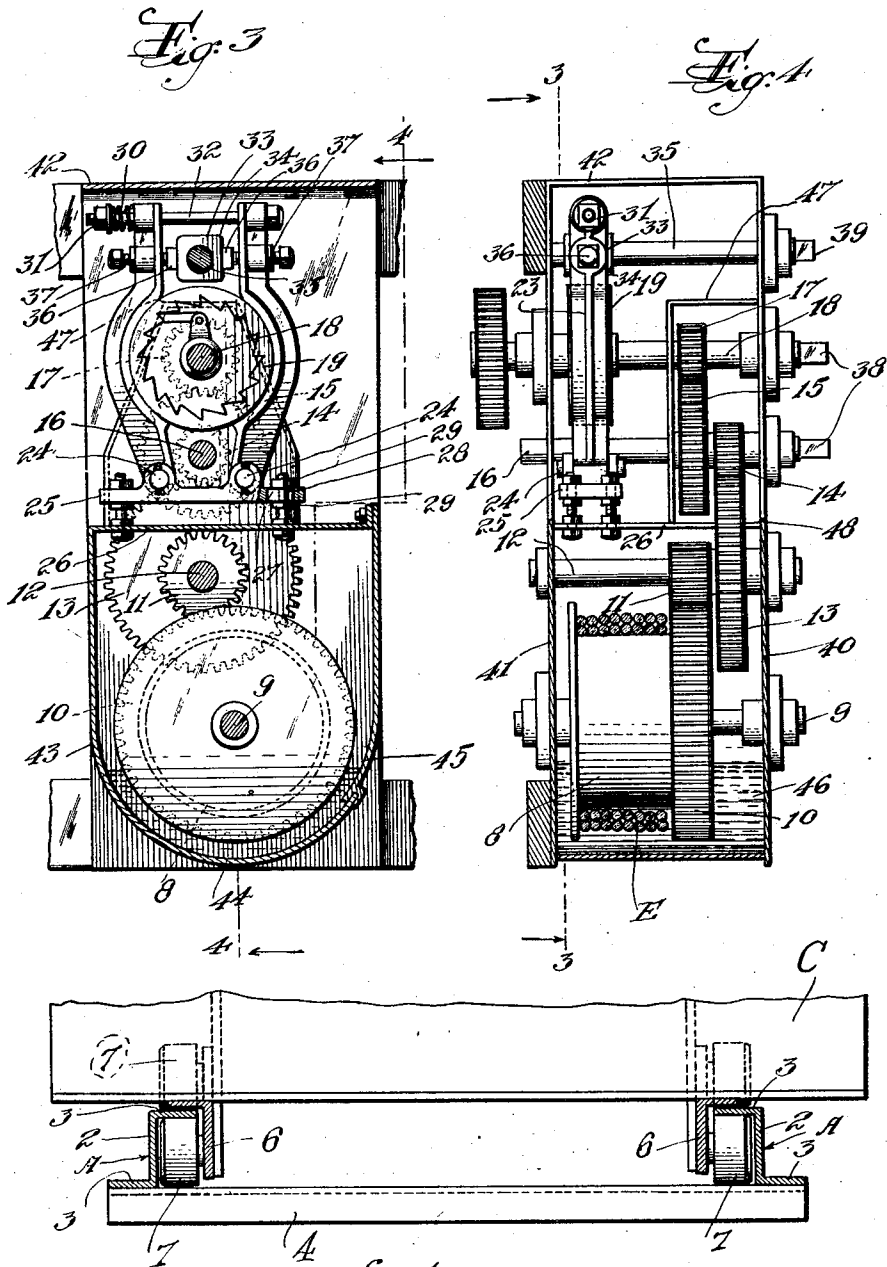


Fig. 5

INVENTOR,  
Rudolph De Lamar,  
BY  
E. H. Look,  
ATTORNEYS

## UNITED STATES PATENT OFFICE

RUDOLPH DE LAMAR, OF NEW YORK, N. Y., ASSIGNOR TO HENRY S. GERMOND, JR., OF BAYONNE, NEW JERSEY

## PORTABLE ELEVATOR

Application filed April 10, 1928. Serial No. 268,905.

This invention relates in general to elevating apparatus and particularly to portable elevators and so-called tiering machines which comprise a portable vertical frame upon which is vertically movable by hoisting apparatus a load-carrying platform. The frames of such elevators are now commonly made of channel bars having their channels in opposed relation, and the load-carrying platform has rollers movable in said channels. The channel bars are connected together by tie bars, and the frames are both longitudinally and transversely braced. In practice it is found that such frames are subjected to torsional or twisting strains due to tendency of the platform to swing in horizontal planes, and no practical bracing has been provided to eliminate this twisting of the frame. Elevator frames which are composed of four angle bars connected together by tie bars and struts and having the rollers of the platform arranged in opposite angle bars, are not so objectionable from the standpoint of twisting or warping of the frame, but a large amount of material and labor are necessary in the construction of such an elevator, and the frame is large and cumbersome.

Accordingly, one object of my invention is to provide a portable elevator having a frame embodying novel and improved features of construction whereby twisting or warping of the frame is reduced to a minimum, and a maximum of strength and resistance to strains in all directions is obtained with a minimum amount of material and labor cost. This object is accomplished in one manner by the use of a metal bar for the side of the elevator frame which has a main web and two flanges integral with and projecting from said web in opposite directions at opposite longitudinal sides of the web. One of said flanges is utilized as the guideway for the platform rollers, one roller

of the platform being arranged at each side of said flange.

Other objects of the invention will more fully appear from the following description in connection with the accompanying drawings, in which corresponding and like parts are designated throughout the several views by the same reference characters. Referring to said drawings,

Figure 1 is a side elevation of a portable elevator embodying my invention;

Figure 2 is a front elevation thereof;

Figure 3 is an enlarged vertical sectional view through the hoisting apparatus, taken on the line 3—3 of Figure 1;

Figure 4 is a side elevation of the apparatus shown in Figure 3, viewing the same from the line 4—4, and

Figure 5 is an enlarged horizontal sectional view, taken on the line 5—5 of Figure 1.

Specifically describing the illustrated embodiment of the invention, the reference character A designates the main vertical frame of the elevator which is mounted upon a horizontal base B in the form of a wheeled truck. The frame A comprises two vertical so-called "Z-bars" 1 each of which comprises a web 2 having at opposite longitudinal edges thereof flanges 3 disposed at right angles to the plane of the web and extending in opposite directions. These bars 1 are arranged in spaced relation, with the webs parallel and one of the flanges 3 of each of the bars extending toward the corresponding flange of the other bar, as clearly shown in Figure 5 of the drawings. The bars 1 are connected together at spaced points in their length by tie bars 4.

Mounted on the bars of frame A to move vertically up and down is a load-carrying platform C which has a load-receiving portion 5 and a supporting arm 6 arranged at right angles to the portion 5 and carrying at opposite ends thereof a pair of substantially

cylindrical rollers 7, one roller of each pair being arranged upon each side of the corresponding flange 3, as clearly shown in Figures 1 and 5 of the drawings. The platform C is actuated up and down on the frame A by a hoisting apparatus generally designated D to which is connected a cable E which passes over a pulley F at the top of the frame A and has its other end connected as at G to the platform C.

It has been found in practice that the frame A of an elevator so constructed is substantially rigid in all directions, and there is practically no twisting motion or swinging of the frame in any direction even with the platform fully loaded and at the top of the frame. This is believed to be due to the fact that the two flanges 3 arranged at right angles to the web 2 reinforce said web against any twisting out of its plane, and the plane of the web 2 being in the direction of the strains imposed upon the frame by the platform, effectively holds the frame against lateral swinging. In other words, any torsional or twisting strain on the web 2 of the bar 1 must tend to throw the longitudinal edges of the web out of parallel and into curves which are parts of helixes, and these tendencies are almost entirely counteracted by the flanges 3, the planes of which are disposed substantially parallel to the planes of such strains on the web 2.

The hoisting apparatus D comprises a hoisting drum 8 mounted on the shaft 9 and around which is wound the cable E. A gear 10 is connected to the drum and meshes with a pinion 11 on a shaft 12 connected to a gear 13 which in turn meshes with a pinion 14 fast connected to a gear 15 on a shaft 16. The gear 15 meshes with a pinion 17 on a shaft 18 upon which is rotatable a brake drum 19. The interior of the drum has a ratchet 20 with which cooperates a spring pawl 21 carried by an arm 22 fixed upon the shaft 18.

A pair of brake shoes 23 surround the brake drum and are independently connected at their lower ends by pins 24 to a bracket 25 which is adjustably mounted on the partition 26 of a housing for the hoisting mechanism. This bracket 25 has a plurality of slots 27 through which pass bolts 28 carrying nuts 29 at opposite sides of the bracket. The bolts 28 are fast connected to the partition 26 in any suitable manner. With this construction it will be observed that the brake shoes 23 may be adjusted vertically and horizontally with respect to the drum 19 by adjustment of the nuts 29 on the bolts and by horizontal sliding of the bracket 25 relatively to said bolts. It is thus possible to provide accurate contact of the brake shoes with the brake drum and to compensate for wear. The other ends of the brake shoes are influenced toward each other so as to force the brake shoes into contact with the drum by means of a compression

spring 30 which is interposed between one of the brake shoes and a nut 31 on a bolt 32 which connects the two brake shoes. For actuating the brake shoes out of engagement with the drum 19 I provide a substantially square actuating block 33 which has round corners 34, said block being mounted on a rotatable shaft 35. This block 33 cooperates with bearing heads 36 mounted on the ends of screws 37 adjustably mounted in the respective brake shoes. The brake shoes are normally in contact with the drum 19 under the influence of the spring 30, and the block 33 is normally disposed with two vertical parallel sides in slightly spaced relation to the respective bearing heads 36. Upon rotation of the shaft 35 the block 33 is rotated so that diagonally opposite corners thereof are brought into contact with the bearing head 36, so as to force the brake shoes away from the drum. When the shaft 35 is released the spring 30 returns the brake shoes to normal position. This brake mechanism is claimed in my copending application Serial No. 363,784, filed May 17, 1929.

The hoisting apparatus has been illustrated for manual operation, each of the shafts 16 and 18 being provided with a polygonal end portion 38 to receive a suitable crank handle for rotating the shafts, and the shaft 35 is formed with a similar polygonal end 39 to receive the crank handle; but a motor may be employed if desired.

In operation, to raise the platform C, a crank (not shown) is applied to either shaft 16 or 18 and rotated in the proper direction, which through the gears 17, 15, 14, 13, 11 and 10 causes rotation of the drum 8 and winding of the cable E thereon. During this operation the pawl 21 passes freely over the ratchet teeth 20, but when the crank is released the pawl engages one of the teeth 20 so as to hold the platform in the elevated position. To permit the platform to descend, the crank is applied to the shaft 35 which is rotated and through movement of the block 33 moves the brake shoes out of contact with the brake drum 19. Backward rotation of the shafts 16 and 18 and the cable drum 8 is thus permitted and the platform C descends by gravity.

The shafts 16, 18, 12 and 9 may be journaled in any suitable manner upon the frame, but preferably are associated with a housing or casing for the hoisting mechanism, said casing being shown in the present instance as comprising front and rear walls 40 and 41 in which said shafts are journaled, said walls being connected at the top by a wall 42 and at the bottom and part of one side by a wall 43. The intermediate partition 26 also connects said front and rear walls. The wall 43 has a portion thereof substantially concentric with and spaced from the drum 8, as indicated at 44, and a removable cover 45 supplements the

wall 43 in completely enclosing the drum 8. The space provided between the wall 43 and the front and rear walls 40 and 41 beneath the drum 8 is constantly filled with oil 46, and the drum and gear 10 constantly dip in said oil. This oil is splashed upwardly by the drum and gear during operation thereof onto the pinion 11, gear 13, pinion 14, gear 15 and pinion 17. The pinion 17, gear 15 and pinion 14 are enclosed within a supplemental or auxiliary casing 47 which communicates with the oil chamber through the opening 48 in the partition 26 through which the oil is thrown upwardly onto the pinion 14, etc. Above the partition 26 no side walls are provided in the housing for the reason that free access to the brake mechanism is desirable, and it is not desirable to enclose the brake mechanism within the same casing as the gears for the reason that oil on the brake would be very detrimental.

While I have shown and described the invention as embodied in one specific form of apparatus, it will be understood that this is primarily for the purpose of illustrating the principles of the invention and that many modifications and changes may be made in the details of construction of the apparatus without departing from the spirit or scope of the invention. Therefore, I do not desire to be understood as limiting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. An elevating apparatus comprising a vertical frame including a pair of spaced bars each having a web parallel to the web of the other and a pair of flanges extending in opposite directions at substantially right angles to said webs, a load-carrying platform having a set of rollers mounted to run on one flange of each bar, the rollers of each set being disposed at opposite sides of the respective flange, and means for raising and lowering said platform.

2. An elevating apparatus comprising a base, a vertical frame mounted thereon including a pair of spaced bars each having a web parallel to the web of the other and a pair of flanges extending in opposite directions at substantially right angles to said webs, a plurality of tie bars connecting one flange of one bar to the corresponding flange of the other bar, a load-carrying platform having a set of rollers mounted to run on the other flange of each bar, the rollers of each set being disposed at opposite sides of the respective flange, and means for raising and lowering said platform.

3. An elevating apparatus comprising a base, a vertical frame mounted thereon including a pair of spaced bars each having a web parallel to the web of the other and a pair of flanges extending in opposite directions at

substantially right angles to said webs, said bars being disposed with one flange of one bar extending toward the corresponding flange of the other bar and in the same plane, a plurality of tie bars connecting the other flanges of said bars, a load-carrying platform having a set of rollers mounted to run on the first-mentioned flange of each bar, the rollers of each set being disposed at opposite sides of the respective flange, and means for raising and lowering said platform.

RUDOLPH DE LAMAR.

80

85

90

95

100

105

110

115

120

125

130