

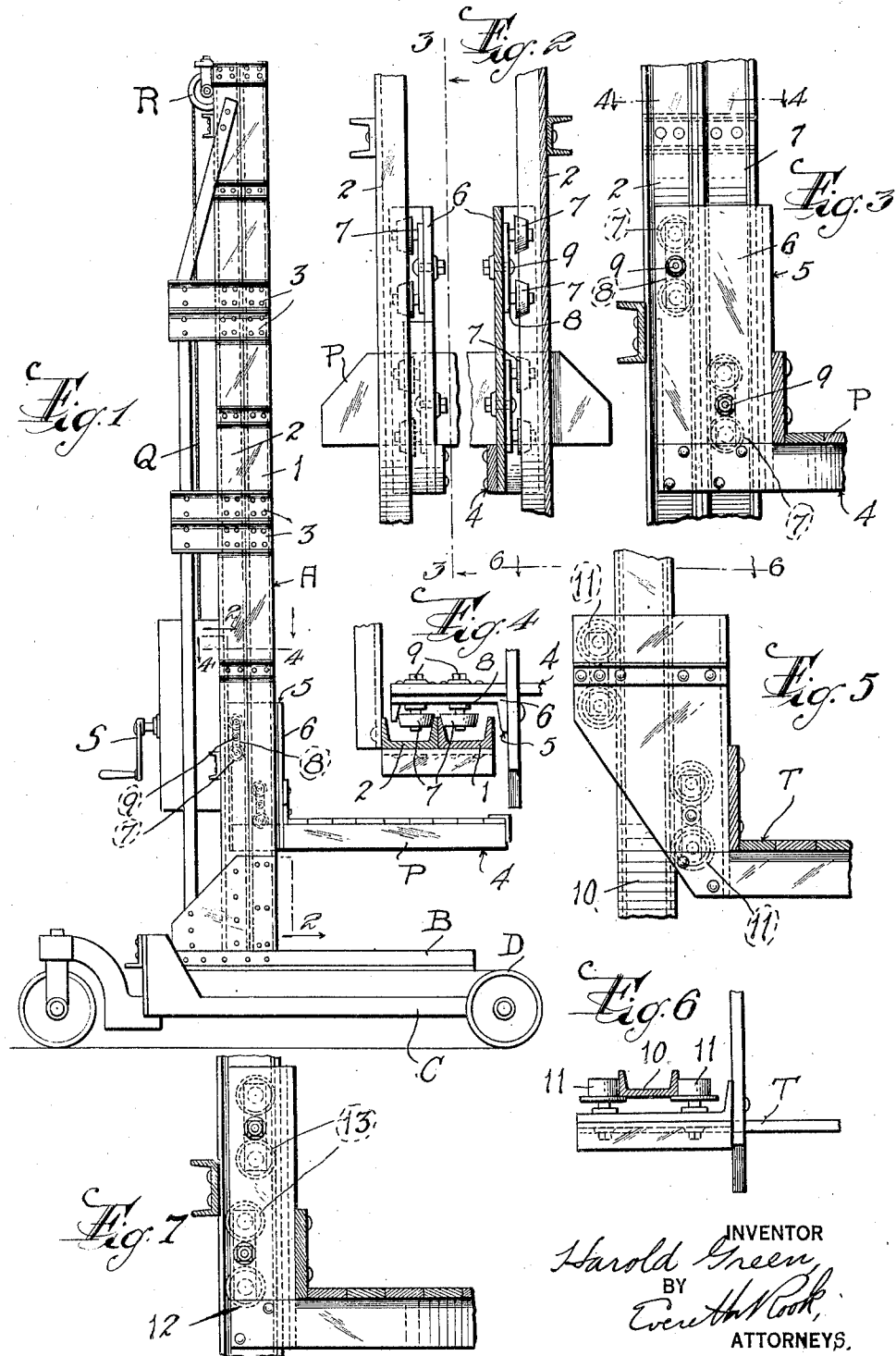
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PORTABLE ELEVATOR

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PORTABLE ELEVATOR.

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This invention relates in particular to that type of portable elevator generally known as a tiering machine and which includes a vertical frame on which is mounted for vertical movement a platform or load support which is raised or lowered usually by a cable hoist also mounted on said frame.

In such machines the frame usually includes two opposite channel bars with the channel sides facing each other, and the load support is usually L-shaped with a roller at each end of one arm at each of opposite sides thereof arranged for rolling movement in the channel of the corresponding channel bar. The other arm of the load support projects at substantially right angles to the frame and directly receives the load. In operation of such machines, action of gravity upon the load support forces the rollers at one end of the load support against one flange of the corresponding channel bars and the rollers at the other end against the other flanges of said channel bars so that in time with the platform heavily loaded and repeatedly moving up and down, the flanges of the channel bars become spread apart and permit looseness or play of said rollers in the channels and if not promptly repaired or replaced will allow the load support to fall bodily out of the frame, whereby the efficiency of the machine is materially reduced or the machine rendered useless.

The primary object of the present invention is to provide a machine of the general character described embodying novel and improved features of construction for mounting the load support in the vertical frame to overcome the above-mentioned objections to known machines.

Another object is to provide a machine of the character described embodying a novel and improved construction which at the same time provides a frame adapted to support heavy loads, and load support guides of a strength and durability commensurate with those of said frame, whereby a strong and durable machine is produced with efficient use of a minimum of material.

Further objects are to provide in such a machine a frame including a pair of vertical and parallel channel bars at each side thereof fixedly secured together with their channels facing inwardly and adjacent flanges abutting, and a load support having

said rollers mounted thereon so that the rollers at one end are arranged to roll in one of said channel bars at each side and the rollers at the other end are arranged in the other of said channel bars, whereby the pressure of said rollers incident to a load on said support is assumed by the two abutting flanges of each of said pairs of channel bars and one of said flanges reenforces the other; to provide such a machine which is simple and inexpensive, and to obtain other results and advantages as may be brought out by the following description.

Referring to the accompanying drawings, in which the same reference characters designate corresponding and like parts throughout the several views,

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

Figure 2 is an enlarged fragmentary partial front elevation and partial sectional view on the line 2—2 of Figure 1, showing the mounting of the load support or platform in the frame;

Figure 3 is a transverse vertical sectional view, taken on the line 3—3 of Figure 2;

Figure 4 is a horizontal sectional view, taken on the line 4—4 of Figure 3;

Figure 5 is a view similar to Figure 3 showing a modified construction;

Figure 6 is a horizontal sectional view, taken on the line 6—6 of Figure 5, and

Figure 7 is a view similar to Figure 6 showing another modified construction.

Specifically describing the present embodiment of the invention, the reference character A designates the vertical frame of the elevator which is preferably mounted on a turntable B rotatable on a truck C having wheels D whereby the elevator may be moved from place to place as desired. This construction is broadly old and no claim to novelty is made.

In accordance with the invention the frame A comprises two pairs of channel bars each consisting of bars 1 and 2, one pair at each side of the frame in spaced relation with the channels of the opposite bars facing inwardly of the frame. Each of the bars of each pair has one flange arranged in abutting relation to one flange of the other bar throughout its length, as clearly shown in Figure 3. The bars 1 and 2 of each pair may be held in this relation in any suitable manner, but for the purposes of simple il-

illustration the bars are shown as secured together by short sections 3 of channel bars riveted to the channel bars 1 and 2. The bars 1 and 2 may be of a length to extend the full height which it is desired to construct the frame A, but it is within the scope of the invention to form the frame of a plurality of sections of channel bars arranged end to end and separably, telescopically or hingedly connected whereby the frame may be extended or collapsed as desired.

A load support or platform P is mounted between the two pairs of channel bars for vertical movement in the frame A to elevate a load. The platform P is substantially L-shaped and may be of any suitable construction with one arm 4 arranged horizontally and the other arm 5 disposed vertically and carrying means for supporting the platform in the frame A. In the present instance, the arm 5 is provided at opposite sides with channel bars 6 of a width greater than the combined width of the two frame channel bars 1 and 2. A pair of rollers 7 is secured between the flanges of each of the bars 6 at each end thereof, the rollers 7 of each of said pairs being journaled at opposite ends of a lever 8 which is pivotally connected intermediate its ends as at 9 to the corresponding bar 6. The pairs of rollers 7 are so disposed on the corresponding bars 6 that one pair on each of the bars 6 is arranged within the channel of each of the frame bars 1 and 2. Each of the pairs of rollers 7 on each of the bars 6 thus engages one of the abutting flanges of the frame channel bars 1 and 2. Obviously, the one of said pair of rollers 7 on each of the bars 6 at the lower end of the corresponding bar will be arranged in the inner frame channel bar 1 while the other pair of rollers 7 will be arranged in the outer channel bar 2, so that the platform P is supported on the rollers which provide an anti-friction carriage for the platform in its movements up and down on the frame A.

Any suitable hoisting or elevating apparatus may be utilized for raising and lowering the platform P, and for simplicity in illustration the hoisting apparatus is schematically illustrated and includes a cable Q mounted on a pulley R at the top of the frame A with one end secured to the platform P and the other end connected to a winding drum (not shown) actuated by a crank handle S.

With such a construction, it will be observed that the parallel frame bars 1 and 2 at each side of the frame A reenforce each other and adapt the machine for elevating heavy loads. At the same time, the use and the particular arrangement of the parallel channel bars 1 and 2 secured together with abutting flanges, provides a reenforced track or guide for the platform P. In this connection, it should be noted that the pressure or

strains exerted by the load on the platform P upon the pairs of rollers 7 on each of the arms 6 are applied to the abutting flanges of the frame bars 1 and 2 in opposite directions, one set of rollers directly applying the strain to one of said abutting flanges and the other set of rollers directly applying the strain to the other of said flanges. The two abutting flanges thus reenforce each other and any tendency of one set of rollers to bend outwardly or otherwise distort the one of said abutting flanges which it engages, will be offset and counteracted by the other set of rollers the strain upon which is directed oppositely to that of the first-mentioned set of rollers. It should further be noted that the utilization of a pair of rollers at each end of each of the bars 6 instead of one roller as is common in portable elevators of this type, serves to distribute the strain at the ends of the bars 6 over a greater area of the frame bars 1 and 2. In other words, the strain at each end of each of the bars 6 is divided by the corresponding pairs of rollers 7 and applied at spaced points to the engaging flange of the corresponding frame bar 1 or 2.

In Figures 5 and 6 of the drawings I have shown a modified construction wherein the frame comprises two spaced vertical and parallel channel bars 10 having their bases facing each other. The platform T has two pairs of rollers 11 at each side thereof, each pair of said rollers at each side of the platform bearing upon the outside of one of the flanges of the corresponding channel bar 10.

Another modified construction is shown in Figure 7 in which the frame comprises two spaced and parallel channel bars 12 having their channels facing each other, and the platform has two pairs of rollers 13 at each side thereof, each pair of said rollers at each side of the platform bearing upon one of the flanges of the corresponding channel bar 12.

While I have shown and described the machine as embodying certain details of construction, it will be understood that this is mainly for the purpose of illustrating the principles of the invention, and that many modifications and changes may be made in the details of construction without departing from the spirit or scope of the invention. For instance, only one roller might be utilized in place of each of the pairs of rollers 7 as is common in portable elevators of this type, and other arrangements than the specific channel bar construction shown may be utilized. Furthermore, the invention is susceptible of use in other devices than portable elevators, for instance wherever a wheeled member or carriage is mounted in a guide. 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 elevator comprising a frame including two vertical spaced and parallel pairs of channel bars, each bar of each of said pairs having one flange abutting one flange of the other bar of said pair, and the bars of each pair having their channels facing the channels of the other pair, a substantially L-shaped load support arranged between said pairs of bars and having a pair of rollers at each side of and spaced longitudinally of one arm thereof with one of each of said pairs of rollers arranged within one of the corresponding pair of said channel bars to roll upon one of said abutting flanges, the other arm of said load support projecting horizontally from said frame to receive a load, and means for raising and lowering said load support on said frame.

2. An elevator comprising a frame including two vertical spaced and parallel pairs of channel bars, each bar of each of said pairs having one flange abutting one flange of the other bar of said pair, and the bars of each pair having their channels facing the channels of the other pair, a substantially L-shaped load support arranged between said pairs of bars and having two pairs of rollers at each side of one arm thereof, the rollers of each of said pairs being mounted on opposite ends of a lever and said levers being pivotally mounted intermediate their ends one at each end of said arm of the load support with the rollers carried thereby arranged within one of the corresponding pair of said channel bars to roll upon one of said abutting flanges, the other arm of said load support projecting horizontally from said frame to receive a load, and means for raising and lowering said load support on said frame.

3. An elevator comprising a vertical frame including two spaced and parallel pairs of channel bars arranged with the channels of one pair facing the channels of the other pair, each bar of each of said pairs having one flange abutting one flange of the other bar, a load support arranged between said two pairs of bars and provided with two pairs of rollers on each side thereof, the rollers of each of said pairs being mounted on opposite ends of a lever and said levers being pivotally mounted intermediate their ends in spaced relation on the corresponding side of said load support with the rollers carried thereby arranged within one of the corresponding pair of said channel bars to roll upon one of said abutting flanges, the other arm of said load support projecting

horizontally from said frame to receive a load, and means for raising and lowering said load support on said frame.

4. The combination of a load carrying member having a supporting portion and a load carrying portion offset from said supporting portion, said member having rollers spaced longitudinally and offset laterally from said supporting portion, and a guide for said member including a pair of parallel channel bars each having one flange abutting one flange of the other, one of said rollers being mounted to roll in each of said channel bars and bearing upon one of said abutting flanges, whereby the load upon said load carrying portion is assumed by said abutting flanges one of which reinforces the other.

5. The combination of a load carrying member having a supporting portion and a load carrying portion offset from said supporting portion, said member having a pair of rollers at each of opposite sides thereof, the rollers of each pair being spaced longitudinally and offset laterally of said supporting portion, and a pair of spaced and parallel guides one arranged at each side of said member and each including a pair of channel bars each having one flange abutting one flange of the other and each of said channel bars having one of the corresponding pair of rollers arranged therein to roll on the said flange thereof abutting the adjacent channel bar.

6. An elevator comprising a vertical frame including a pair of parallel channel bars each having one flange thereof abutting one flange of the other, and an L-shaped load support having rollers upon one arm thereof one of which is arranged in reach of said channel bars to roll upon one of said abutting flanges, and means for raising and lowering said load support on said frame.

7. The combination of a member having two pairs of rollers thereon, the rollers of each pair being mounted on opposite ends of a lever and said levers being pivotally mounted intermediate their ends in spaced relation longitudinally and offset laterally of said member, and a guide for said member including a pair of parallel channel bars each having one flange abutting one flange of the other, one of said pairs of rollers being mounted to roll in each of said channel bars and bearing upon one of said abutting flanges, whereby the weight of said member is borne by said abutting flanges each of which reinforces the other and said weight is distributed by said pairs of rollers.

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