G. M. FRENCH AND W. B. PAVEY.

LIFTING DEVICE.

APPLICATION FILED AUG. 3, 1918.

1,349,450.

Patented Aug. 10, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

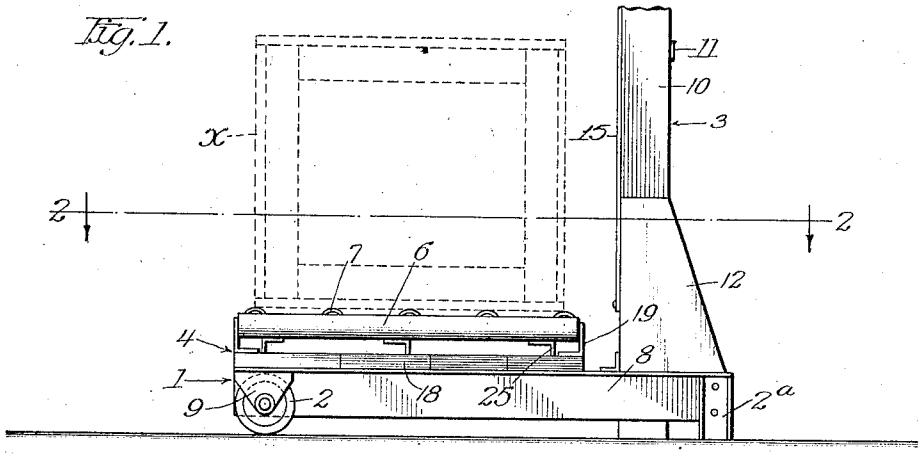
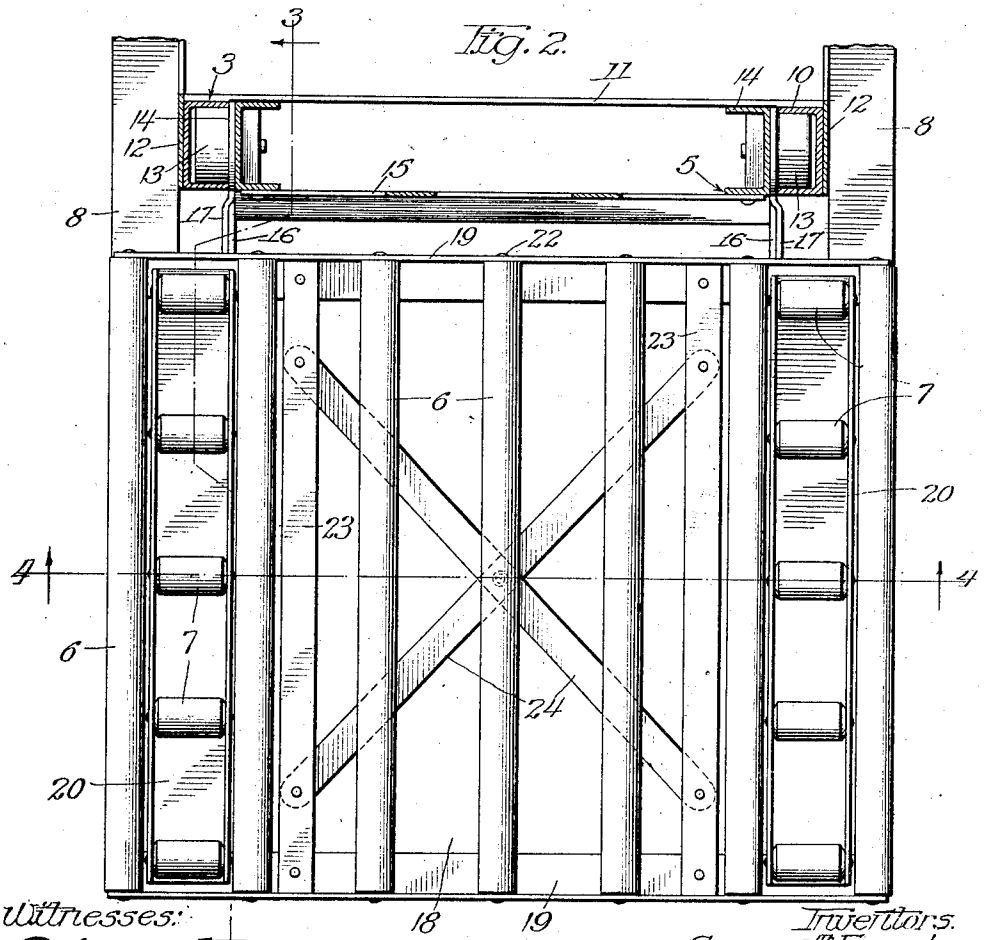


Fig. 2.



Witnesses:

Robert H. Weir

Arthur M. Carlson

Inventors:

George M. French

and William B. Pavey

By Miller Churchill Parker Attys.

G. M. FRENCH AND W. B. PAVEY.

LIFTING DEVICE.

APPLICATION FILED AUG. 3, 1918.

1,349,450.

Patented Aug. 10, 1920.

2 SHEETS—SHEET 2.

Fig. 3.

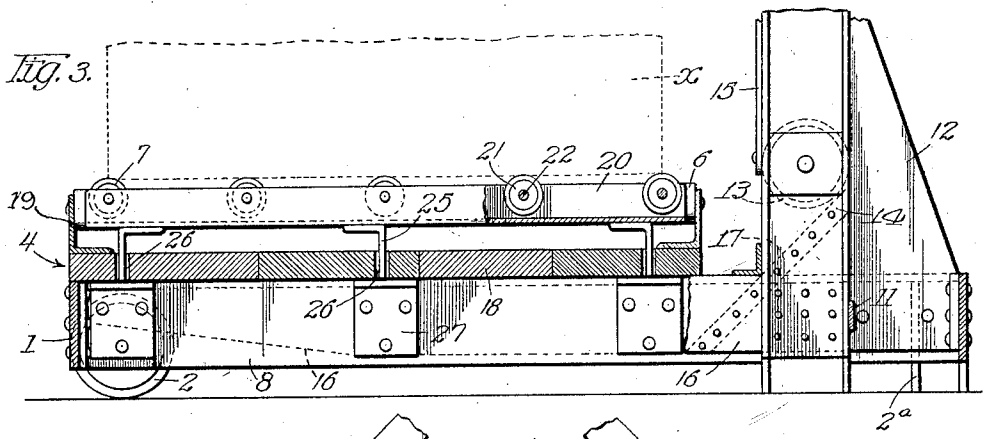


Fig. 4.

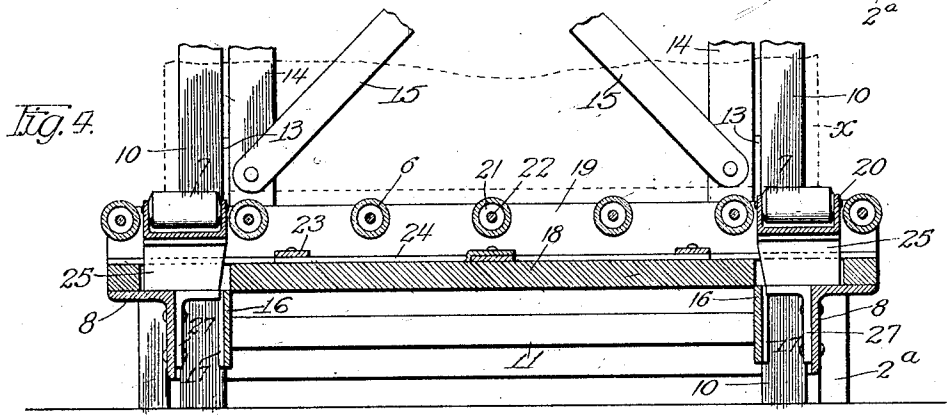
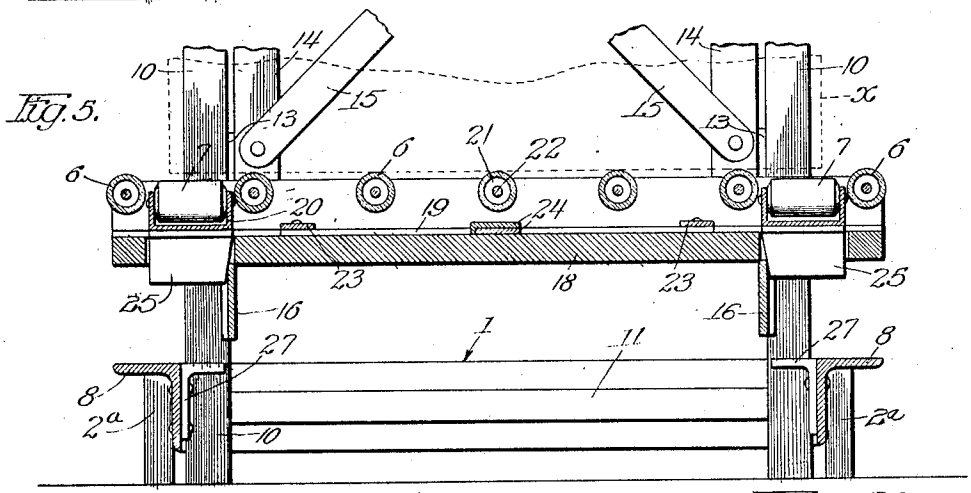


Fig. 5.



Witnesses:

Robert F. Fuller

Arthur W. Carlson

Inventors.

George M. French.

AND

William B. Pavey.

By Miller, Crandall & Parker,

Attys.

UNITED STATES PATENT OFFICE.

GEORGE M. FRENCH AND WILLIAM B. PAVEY, OF CHICAGO, ILLINOIS, ASSIGNORS TO ECONOMY ENGINEERING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LIFTING DEVICE.

1,349,450. Specification of Letters Patent. Patented Aug. 10, 1920.

Application filed August 3, 1918. Serial No. 248,098.

To all whom it may concern:

Be it known that we, GEORGE M. FRENCH and WILLIAM B. PAVEY, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lifting Devices, of which the following is a specification.

The invention relates to lifting devices of the type especially adapted for use in stacking heavy boxes and like articles; and the general object of the invention is to provide an improved platform for a lifting device of the character stated, which will facilitate the loading and unloading of articles onto and off from the platform.

A more specific object of the invention is to provide a platform which will enable the easy movement of an article onto the platform in one direction when the platform is in one position, or off from the platform in another direction transverse to the first, when the platform is in another position.

The objects of the invention thus generally stated are attained by providing the platform with one set of stationarily mounted rollers and one or more sets of movably mounted rollers disposed at substantially right angles to the first mentioned set of rollers and movable vertically to position in which their upper surfaces are above or below the upper surfaces of the stationary rollers.

In the accompanying drawings, wherein we have illustrated a preferred embodiment of our invention, Figure 1 is a fragmentary side elevation of a portion of a tiering machine or stacker to which the invention is applied, the movably mounted rollers being shown in their uppermost position. Fig. 2 is a horizontal sectional view taken in the plane of line 2—2 of Fig. 1. Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 2. Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 2. Fig. 5 is a view similar to Fig. 4, but showing the platform elevated, with the movably mounted rollers in their lowermost position.

In the drawings, 1 indicates the main frame of a tiering machine mounted upon rollers 2 and legs 2^a and having an upright portion or guide frame 3. 4 is a platform extending forwardly from the lower end of a frame 5, which latter is movable vertically relative to the guide frame 3; while 6 indicates a set of rollers stationarily mounted upon the platform, and 7 are rollers movably mounted upon the platform at right angles to the rollers 6.

The main frame 1 is preferably rectangular in form, and the opposite side rails 8 thereof are formed of angle bars disposed so that their angles open outwardly and downwardly. Beneath the horizontal portions or ledges of said bars, at the forward ends thereof, the rollers 2 are mounted in suitable brackets 9, and at the rear ends thereof the legs 2^a are secured.

The guide frame 3 is located at the rear portion of the main frame 1 and may comprise a pair of upright channel bars 10 secured to the inner sides of the rails 8, and connected by means of cross bars 11. Gusset plates 12 are also preferably employed to brace the bars 10 relative to the base.

The channels of the bars 10 open inwardly to form vertical guide-ways for rollers 13 carried by the movable frame 5. Said frame preferably comprises a pair of upright channel bars 14 connected together by means of cross bars 15, with their channels opening inwardly. The rollers 13 are suitably mounted upon the outer faces of said upright bars 14, two rollers being preferably employed for each bar, at opposite ends thereof, and preferably said rollers are provided with flanges at their ends adjacent the bars 14 adapted to engage with the inner edges of the bars 10, so as to provide a slight space between said bars 10 and 14.

At their lower ends the upright bars 14 of the guide frame have secured thereto the rear ends of a pair of forwardly extending arms 16 for carrying the platform 4. As shown in Fig. 3, said arms are secured to the outer faces of the bars 14, and angle bars 17 are preferably employed to assist in rigidly supporting said arms.

The platform 4 comprises a base 18 which may be made of wood and mounted in a suitable way upon the arms 16. Upon its forward and rear ends said base is provided with a pair of angular bearing brackets 19 for stationarily supporting the rollers 6, and extending in a direction transversely of the rollers 6 the rollers 7 are mounted in brackets 20 for vertical movement relative to the rollers 6. Herein seven of the rollers 6 are provided, while two sets of five each of the rollers 7 are employed, said sets being

located one at each side edge of the platform between the outermost pairs of rollers 6.

The rollers 6 and 7 may be made tubular in form and mounted, by means of bearing bushings 21 fixed therein, on bearing rods or shafts 22. The opposite ends of the shafts 22 of the rollers 6 are mounted in the bearing brackets 19 at the forward and rear edges of the platform, while the shafts 22 of the rollers 7 are mounted in their brackets 20. The brackets 19 may be secured together by means of longitudinal bars 23, and the latter are connected by means of diagonal bars 24. Thus a rigid frame is provided for supporting the rollers 6.

The brackets 20 for the rollers 7 are preferably in the form of channel bars, and the rollers are made of a length to fit neatly between the upright walls of the channels with the ends of their shafts 22 fixed in said walls. Normally said brackets are arranged to rest at their opposite ends upon the horizontal portions of the brackets 19 upon the base 18, and the parts are so proportioned and arranged that in this position of the brackets 20 (Fig. 5) the upper surfaces of the rollers 7 lie in a plane below the upper surfaces of the rollers 6. When, however, the platform is lowered into position upon the base 1 (Figs. 1, 3 and 4) the rollers 7 are held with their upper surfaces in a plane above the upper surfaces of the rollers 6. To this end, the brackets 20 for the rollers 7 are provided on their under surfaces with a plurality of abutting members 25 in the form of angle irons, each having an upright portion depending through a vertical slot 26 (Fig. 3) in the base 18, and arranged to engage with the main frame 1 when the platform approaches the latter near the end of its downward movement. When the members 25 thus engage with the main frame, downward movement of the brackets 20 and thereby of the rollers 7 is stopped, while the base 18 of the platform, and the rollers 6 thereon, continue to descend into position upon the main frame. Preferably stop members 27 are provided on said main frame to cooperate with the members 25. Said members 27 are in the form of angle irons secured to the inner side faces of the side rails 8 of the frame, and correspond in number to the number of the abutting members 25 carried by the brackets 20.

It will be seen that when the platform is in its lowermost position, the rollers 7 will be held elevated by the members 25 resting upon the side rails 8 and stop members 27 of the main frame. Accordingly, when it is desired to move a box x or the like onto or off from the platform, the rollers 7 are in position to movably support the opposite edges of the box. As soon as the platform is raised, however, the brackets 20, guided by the abutting members 25 operating in the slots 26, drop into their lowermost position upon the horizontal portions of the brackets 19, with the upper surfaces of the rollers 7 below the bearing surfaces of the rollers 6. Therefore, when the platform comes to rest at the desired point in its upward movement, the box x may be readily rolled upon the rollers 6 from off the platform onto a tier or stack of boxes or other desired support, or from such a support onto the platform.

It will be understood that any suitable means may be employed for raising and lowering the platform 4, no such means being herein shown. It will also be understood that, while we have illustrated and described the invention with considerable particularity, we do not intend to be limited to the construction and arrangement set forth except as may be necessitated by the state of the prior art.

We claim as our invention:

1. A lifting device having, in combination, a stationary frame, a platform mounted for vertical movement relative to said frame and having a base with vertical slots therein, a pair of bearing bars fixed on said base, a plurality of rollers supported by said bars, a pair of bearing brackets having depending members arranged to protrude through the slots in the base, rollers carried by said brackets, and means on the main frame arranged to coöperate with said depending members of the bearing brackets when the platform is in its lowermost position to support the rollers on said brackets with their upper surfaces above the upper surfaces of the stationarily mounted rollers.

2. A lifting device having, in combination, a stationary frame having a pair of upright guides, a platform mounted for vertical movement relative to said guides, a pair of bearing bars fixed at two opposite edges of the platform, a plurality of rollers supported by said bars, and a pair of bearing brackets movably mounted on the platform at the other two opposite edges thereof and each carrying a plurality of rollers disposed in a plane substantially at right angles to the first mentioned rollers, said brackets having depending members arranged to engage with the base to elevate the brackets and their rollers when the platform is in its lowermost position.

3. A lifting device having, in combination, a stationary frame, a platform mounted for vertical movement relative to said frame, a pair of bearing bars fixed on the platform, a pair of rollers supported by said bars and spaced apart, and a bearing bracket movably mounted on the platform between said rollers and carrying at each end thereof a roller disposed in a plane transversely of but with its upper surface normally below the upper surface of the first mentioned rollers, said bracket being

arranged to engage with the main frame to elevate the last named rollers when the platform is in its lowermost position.

4. In combination with a lifting device having a stationary frame, a vertically movable platform having a pair of bearing bars fixed thereon and a set of rollers stationarily mounted in said bars, a second set of rollers, means for movably supporting said second set of rollers upon said platform transversely of the first set and with their upper surfaces normally below the upper surfaces of said first set, and means cooperating with said frame for elevating said supporting means and the rollers carried thereby as the platform moves into its lowermost position.

5. In combination with a lifting device, a vertically movable platform, a plurality of rollers stationarily mounted on said platform, a second set of rollers, means for supporting said second set of rollers transversely of the first mentioned rollers and for vertical movement relative thereto, and means for causing a vertical movement of said supporting means and the rollers carried thereby when the platform reaches the end of its movement in one direction.

6. A vertically movable platform having, in combination, a base, two bearing bars mounted on the base, a plurality of rollers supported by said bars, a channel bar mounted between two of said rollers and having a plurality of rollers disposed in a plane transversely of the first mentioned rollers, and means for automatically moving the channel bar in the movement of the platform to carry the upper surfaces of the rollers thereon above the upper surfaces of the rollers carried by said bearing bars.

7. A vertically movable platform having, in combination, a base and two sets of rollers mounted on the base, the rollers of one set being mounted for vertical movement relative to the rollers of the other set, and means for automatically moving the first mentioned rollers in the movement of the platform whereby to carry the uppermost surfaces thereof above or below the uppermost surfaces of the second mentioned rollers, said movable rollers being adapted when in their uppermost position to support an article for movement in a direction transverse to the direction of movement of the article upon the other rollers.

8. In combination with a base, a platform upon said base movable up and down relative thereto and having two sets of rollers thereon, the rollers of one set being angularly disposed and movable vertically with reference to the rollers of the other set, and means acting between said platform and base to effect the vertical movement of said movable rollers.

In testimony whereof we have hereunto set our hands.

GEORGE M. FRENCH.
WILLIAM B. PAVEY.