E. L. BARNES.

MACHINE FOR LOADING COTTON BALES IN CARS.

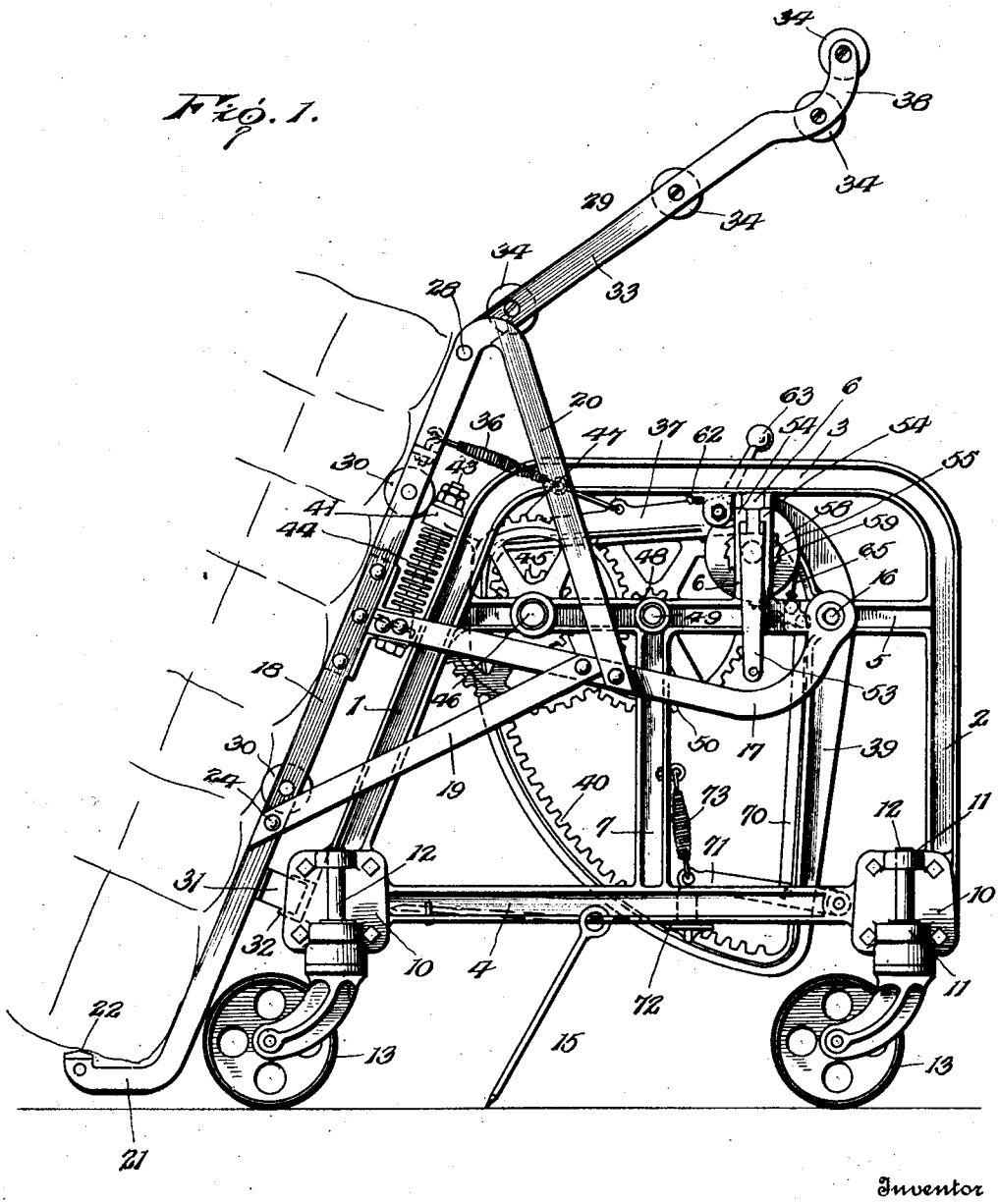
APPLICATION FILED JULY 12, 1920.

1,404,335.

Patented Jan. 24, 1922.

3 SHEETS—SHEET 1.

Fig. 1.



Inventor

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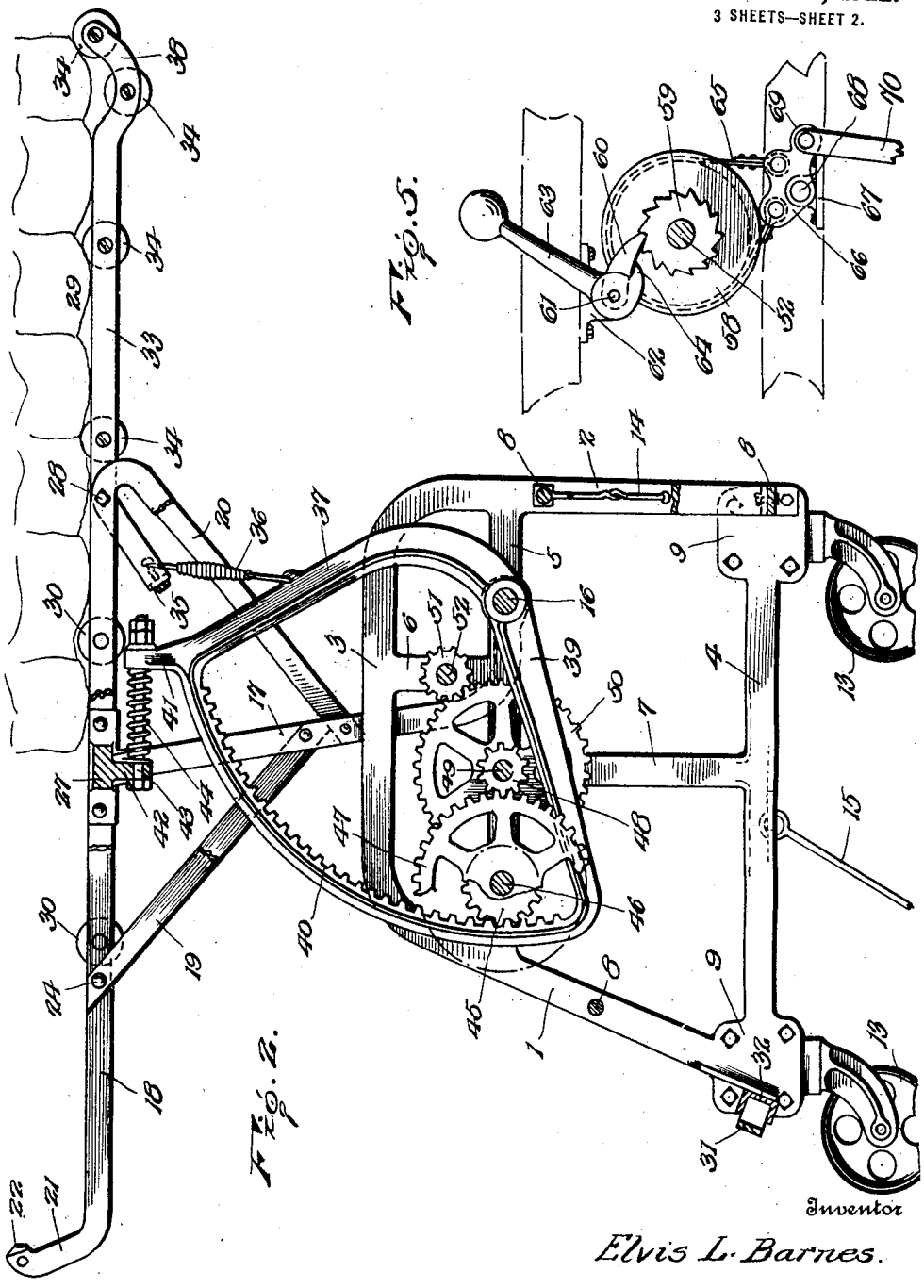


Fig. 2.

Fig. 5.

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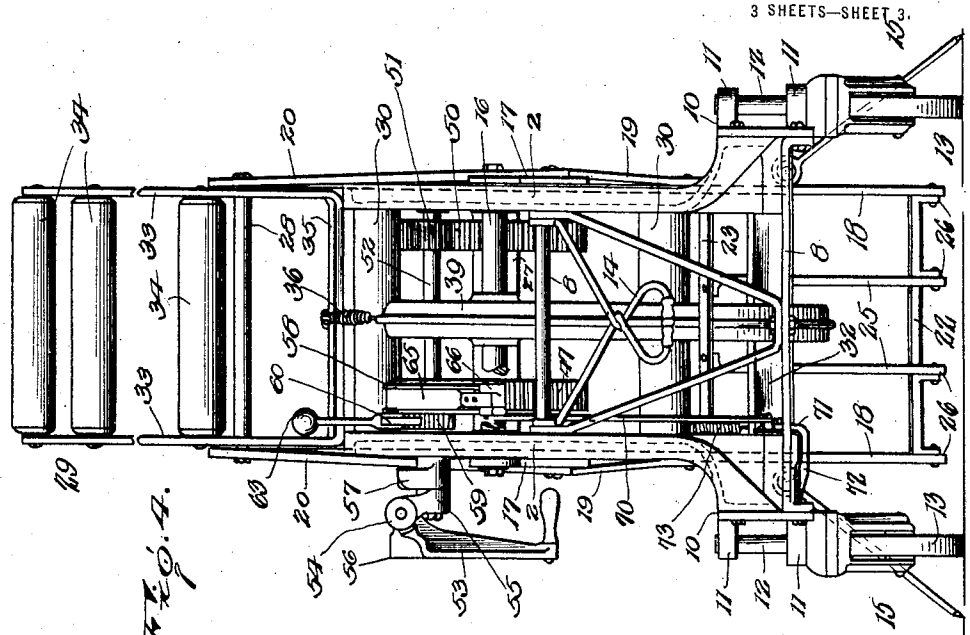


Fig. 4.

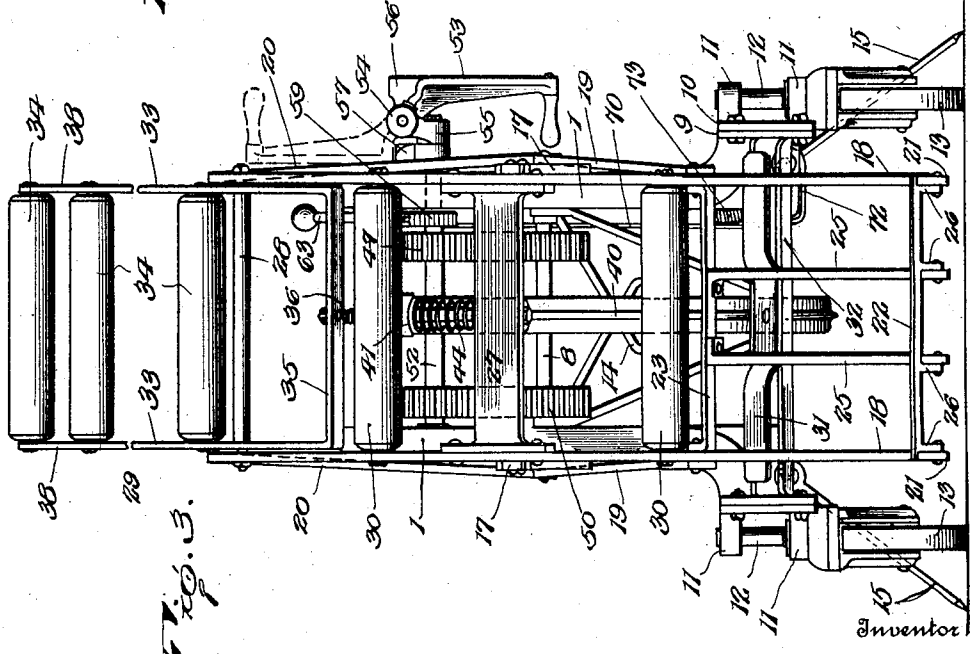


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR LOADING COTTON BALES IN CARS.

1,404,335. Specification of Letters Patent. **Patented Jan. 24, 1922.**

Application filed July 12, 1920. Serial No. 395,436.

To all whom it may concern:

Be it known that I, ELVIS L. BARNES, a citizen of the United States, residing at Oklahoma city, in the county of Oklahoma and State of Oklahoma, have invented certain new and useful Improvements in Machines for Loading Cotton Bales in Cars, of which the following is a specification.

This invention relates to apparatus for storing cotton bales in freight cars and has special reference to machines of the type shown in Letters Patent No. 1,316,410, granted to me September 16, 1919. The object of the present invention is to simplify the cosntruction and improve the operation of the apparatus and also to provide means whereby the bale lifted by the machine may be moved endwise into position above lower bales instead of being discharged laterally. Another object of the invention is to provide means for supporting the bale until it is in its final position and to provide means whereby said supporting means may be withdrawn from between the bales without excessive frictional resistance from the bales. Other objects of the invention are to provide means for eliminating shock to the machine when the carrier is returned to its normal position, and to provide means whereby the descent of the carrier may be controlled. The several stated objects of the invention and such other objects as will incidentally appear in the course of the following description are attained in such an apparatus as is illustrated in the accompanying drawings and the invention resides in certain novel features which will be particularly pointed out in the claims following the description.

In the drawings—

Figure 1 is a side elevation of a machine embodying my present improvements;

Fig. 2 is a view, partly in elevation and partly in longitudinal section, showing the carrier in position to permit discharge of the bale;

Fig. 3 is a front elevation;

Fig. 4 is a rear elevation and

Fig. 5 is an enlarged detailed view of the means for controlling the descent or return of the carrier.

In carrying out the present invention, I employ a main supporting frame which consists essentially of two side frames rigidly connected by cross bars or braces. Each side frame may be a single casting and comprises front inclined bars 1 and rear vertical bars 2 connected at their upper ends by a longitudinal bar 3 and at their lower ends by a sill 4. An intermediate longitudinal bar or beam 5 connects the front and rear bars 1 and 2 at intermediate points of their height and nearer the top bar or beam 3, as clearly shown in Figs. 1 and 2. Vertical braces or standards 6 and 7 extend between and reinforce the longitudinal beams and sills and suitable openings are provided in these several members to furnish bearings for the several shafts of the operating gearing as will hereinafter more fully appear. Cross rods 8 are rigidly secured in and extend between the side frames so as to maintain them in spaced relation and, at its lower corners, each side frame is expanded to provide a clamping plate or base 9 against which is rigidly secured a base plate 10 from which project bearings 11 receiving the spindles 12 of casters 13, the frame being thus supported so that it may be easily moved from place to place as desired for use, and upon the rear cross bar or rod 8, I hang a handle 14 by which the necessary propelling power may be applied to the machine. In order to prevent lateral movement of the machine when it is in use, I provide the anchoring feet or spikes 15 which are suitably hung upon the outer sides of the lower beams or sills 4 and are engaged in the floor of the car or warehouse as will be readily understood. If the floor be perfectly level, these anchors will not be necessary as the weight of the machine and the bale supported thereon will hold it in place, but if the floor be slightly inclined, the weight of the apparatus will tend to cause the machine to travel inasmuch as the rollers or casters 13 may easily rotate. It will be understood that the spindles 12 of these casters or rollers are swiveled in the bearings 11 so that the casters will readily accommodate themselves to the line of travel and permit the machine to be moved in any direction.

Secured in and extending between the beams 5 of the two side frames, near the rear standard or bar 2, is a stationary shaft or fulcrum rod 16 and upon the said rod at or near the ends of the same and at the outer sides of the side frames are pivotally mounted the side arms 17 of the carrier. In the

normal position of the machine or when it is at rest, these arms 17 extend beyond the front of the machine and are rigidly secured to the side bars 18 of the carrier, the arms 17 constituting levers adapted to move about the rod 16 as a center and thereby raise or lower the carrier as will be readily understood. A brace 19 is secured to and extends between each lever 17 and the corresponding side bar 18 below the lever and the upper extremity of each side bar 18 is doubled on itself and carried rearwardly to provide a brace 20 which is secured to the corresponding lever 17 immediately adjacent the brace 19, as clearly shown in Figs. 1 and 2. The lower ends of the side bars 18 are turned forwardly, as shown at 21, and a cross bar 22 is secured to the said forwardly turned portions, as shown, whereby to provide a shelf or rest which is engaged under the bale to be raised as will be readily understood. To reinforce the bale-engaging portion of the carrier, I provide a cross bar or brace 23 which is disposed between the side bars and secured to the same by the same bolt or rivet 24 which secures the braces 19 thereto and to the said cross brace 23 at opposite sides of the center thereof, I secure the brackets or hangers 25 which extend downwardly or forwardly from the brace parallel with the side bars 18 and have their lower ends secured to the stop bar 22 which is provided with depending lugs 26 to facilitate the attachment of the same to the members 18 and 25. The side bars 18 are further connected and reinforced by a cross beam 27 secured thereto at about the centers thereof, and near the upper ends of said side bars I provide a cross brace 28 which is also utilized as the pivotal support for the supplemental carrier or extension 29. Rollers 30 are suitably mounted in and between the side bars 18 to facilitate the discharge of the bale and provide supports for the same while the carrier is moving upwardly. To aid in holding the carrier out of contact with the main frame and prevent impact of the carrier upon the main frame with consequent shocks and liability to damage of some of the parts, I provide a buffer 31 in the form of a leaf spring secured at its center to a bracket or bar 32 secured upon the front side of the main frame at the lower corners thereof and having its ends free and projecting from the frame to be engaged by the carrier as it returns to its initial position after having lifted a bale as will be readily understood upon reference to Figs. 1 and 3. The supplemental carrier or extension 29 consists of side bars 33 having a plurality of rollers 34 mounted between the same and connected at their forward or lower ends by a brace 35 which may conveniently be formed integral with the side bars, as clearly shown in Fig. 3. The side bars 33 in advance of the pivotal support 28 are disposed at an angle to the portions of the bars in rear of the said pivot and a coiled spring 36 extends between the said bar 35 and one arm 37 of an operating segment so as to cushion the return of the extension to its normal position relative to the main carrier or lifter as the carrier is withdrawn from the position in which the lifted bale is discharged. At their rear ends, the side bars 33 are given an arcuate formation, indicated at 38, and the rollers carried by this arcuate portion of the side bars are thereby disposed at opposite sides of the plane of the greater portion of the side bar, it being particularly noted that one roller is mounted at the extreme ends of the bars and another roller is mounted at approximately the middle point of the arcs defined by the portions 38.

The carrier is raised through the action of a segmental gear comprising the arm 37, the arm 39, and the rack 40 disposed in substantially triangular relation and pivotally hung upon the rod 16 at the junction of the arms 37 and 39. This segment is disposed in the central longitudinal vertical plane of the main frame and at the junction of the rack 40 and the arm 37 is provided with a forwardly projecting lug 41 through which and a similar lug 42 on the cross bar or beam 27 is passed a coupling bolt 43, a spring 44 being coiled around the said bolt between the lugs 41 and 42 so as to permit some relative movement between the carrier and the segment and thereby absorb the shock incident to the return of the carrier to its lowest position. The rack 40 is an internal rack, as clearly shown in the drawings and meshes with a pinion 45 secured upon a shaft 46 which is journaled in and extends between the beams 5 and near one end of the said shaft 46 I secure a larger gear 47. This gear 47 meshes with a pinion 48 upon a countershaft 49, also journaled in suitable bearings in the beams 5, and at the opposite side of the machine from the gear 47 a gear 50 is secured upon the said countershaft 49. The gear 50 meshes with a pinion 51 upon a driving shaft 52 which is journaled in and extends between the post or standards 6 and has one end extended beyond the adjacent side frame and equipped with a crank or other form of driving handle 53. The said crank 53 has a lateral offset which is pivoted between the lugs or ears 54 of a collar or yoke 55 loosely mounted upon the end of the driving shaft and the end of the crank immediately adjacent the pivot is angular, as shown at 56, and adapted to fit between the lugs 57 rigid with the driving shaft so that if the crank be raised to the position shown in dotted lines in Fig. 3 and then rotated, the engagement of the crank end 56 with the lugs 57 will impart rotation to

the driving shaft and actuate the train of gearing so that the segment will swing upwardly about the fulcrum or pivot 16 and will thereby raise the carrier. A brake drum 58 and a ratchet disk 59, which may be formed integral, are fixed upon the driving shaft at the inner side of one side frame and immediately adjacent the same and the ratchet is engaged by a pawl 60 pivoted upon the fixed pin 61 carried by suitable brackets or bearings 62 on the frame so that retrograde movement of the gearing and the carrier will be prevented. A releasing lever 63 is pivotally mounted upon the pivot 61 and has its head slotted to fit around the pivotal end of the pawl 60 and provided with a spur 64 below the pivot to bear against the under side of the pawl and thereby lift the pawl out of engagement with the ratchet when the lever is swung forwardly as will be readily understood on reference to Fig. 5. When the carrier is being raised, the pawl will yield to the movement of the ratchet wheel which will ride under the same and permit uninterrupted movement of the gearing and the carrier, but if the propelling force should cease, the pawl will at once drop behind a tooth of the ratchet wheel and will hold the parts against backward movement so that the carrier with the bale thereon will be prevented from dropping. It will also be readily noted that when the bale has been discharged and the carrier is to be returned to its initial position, the crank 53 is swung down, as shown in full lines in Figs. 3 and 4, and will thereby remain at rest instead of flying around and being liable to injure the operator. After the crank has been swung to its pendent position, the releasing lever 63 is swng forwardly so that the pawl 60 will be released and the weight of the parts will then automatically cause a return movement. The rapidity of the return movement may be controlled through the action of the brake band 65 which passes around the brake drum 58 and has its ends secured to a rocker 66 mounted upon a suitable support 67 on the adjacent beam 5. The opposite ends of the brake band are pivotally attached to the rocker at opposite sides of the pivot 68 thereof, as clearly shown in Fig. 5, and the rocker is provided with a short extension 69 at its rear end to which is pivoted the upper end of a link 70. The lower end of the link 70 is pivoted to a foot lever 71 which is fulcrumed at its rear end upon the adjacent sill 4 and is provided at its front free end with a laterally projecting pedal 72, the said pedal extending under and laterally beyond the adjacent sill 4 as will be readily understood. A spring 73 secured to the lever and the adjacent standard 7 holds the lever normally raised so that the brake band will be free of the brake drum and will not interfere with the movement of the gearing in raising the carrier. When the carrier is to be lowered, the operator, by applying foot pressure to the pedal 72, may cause the brake band to bind upon the brake drum with more or less force and thereby control the descent of the carrier in an obvious manner.

It is well known that bales of cotton are loaded into the cars with one row of bales standing on end and another row of bales superposed upon the first row of bales but lying on their sides, this arrangement effecting an economy of space so that all the interior of the car is thus utilized. This same arrangement is frequently employed in warehouses and heretofore the operation of raising the bales of the second row into position upon the first row has been exceedingly laborious and time-consuming. My invention expedites the work and eliminates the physical exertion and the tiring effort due to the performance of the work by manual labor. The bales may be delivered in the warehouse or the car upon either the side or the end, although it is desirable to have them delivered upon their ends inasmuch as my apparatus is intended to engage under an end of the bale and support the same by its end. However, while the weight of the bales makes the manual lifting thereof a very laborious proceeding, the bales may be easily canted so as to be stood on end and thereby brought into position upon the carrier. The bale to be raised having been stood upon its end, the machine is moved so that the stop or shelf at the lower end of the carrier may be engaged under the end of the bale whereupon the bale will rest against the carrier, as indicated in Fig. 1 of the accompanying drawings. The crank 53 is then rotated so as to impart motion to the driving shaft and the driving shaft obviously will transfer the motion directly through the train of gearing shown and described to the segmental rack 40. The said rack will thus be caused to swing upwardly about its fulcrum and the carrier will follow the movement and swing simultaneously about the same fulcrum. The carrier will thus be brought into the horizontal position, shown in Fig. 2, and the extension or supplemental carrier 29 will be caused to move over or brought to rest upon the previously arranged bales so that the roller 34 next adjacent the end of the said extension will bear upon the upper end of the adjacent bale. Inasmuch as the raised bale is then resting upon the rollers 30, it may be easily shoved back over the carrier and over the rollers 34 into position over the lower row of bales. As the bale is pushed rearwardly over the carrier its inner or rear end will drop so that some of the weight of the bale will be transferred to the

bale over which it has been moved. The weight of the bale upon the extension 29 tends to swing the said extension downwardly but this tendency is resisted by the combined action of the spring 36 and the rearmost rollers 34, the roller 34 immediately adjacent the extremity of the extension bearing upon the upper surface of the lower bale and the roller 34 at the extremity of the extension bearing against the under side of the bale which is being discharged so that a clear opening is provided through which the extension may be withdrawn in such manner that the upper bale will be permitted to drop easily and smoothly into place upon the lower bales. It will be readily noted, upon reference to Fig. 2, that the roller 34 at the extremity of the extension 29 projects above the plane of the extension, while the roller immediately adjacent the extremity is disposed below said plane, the result being that the extension is held out of contact with the bales during its withdrawal except that the surfaces of the rollers mentioned will ride upon the opposed surfaces of the bales, but as these surfaces will yield to the movement the frictional resistance to withdraw is minimized and derangement or heating of the bales is obviated. Upon reference to Fig. 1, it will be noted that the greater portion of the extension 29 is in rear or above the pivotal support thereof and tends constantly to overbalance the lower or forward portion of the extension and by reason of its greater weight and resultant tendency to drop would be apt to fall upon the top of the main frame and thereby damage the parts and also make it difficult to properly engage the main portion of the carrier with the bale to be raised. The spring 36, however, effectually prevents this damage by providing a yieldable connection between the segment and the extension which will permit the extension to assume the position shown in Fig. 1 so that it will not strike against the roof of the car or of the warehouse but will hold the free rear end thereof within the plane of the main carrier so that it will not interfere with the bringing of the bale into position to be raised.

My improved machine is compact in its arrangement and acts directly upon the carrier so that the bale is raised with the minimum of effort and easily and quickly discharged in position above a lower row of bales. The rolling parts are so formed and arranged that they will operate very easily and are not apt to get out of order.

Having thus described the invention, what is claimed as new is:

1. The combination of a main supporting frame, a carrier mounted upon said frame for pivotal movement relative thereto, means on the frame for operating the carrier, and a supplemental carrier pivotally supported on the first-mentioned carrier and extending from the end thereof over the main frame.

2. The combination of a main supporting frame, a carrier mounted thereon for pivotal movement relative thereto in a vertical plane, means on the main frame for operating the carrier, a supplemental carrier mounted upon and extending from the end of the first-mentioned carrier in alinement therewith and having relative pivotal movement in the same vertical plane, and means for restraining the relative movement of the supplemental carrier.

3. The combination of a main frame, a carrier mounted thereon, means on the main frame for operating the carrier, a supplemental carrier pivotally connected to the first-mentioned carrier, and yieldable means for restraining the supplemental carrier.

4. The combination of a main supporting frame, a carrier pivotally mounted upon the said frame, a supplemental carrier pivotally mounted upon the upper end of the first-mentioned carrier and having a portion extending below the pivotal connection, means on the frame for operating the carrier, said means comprising a vertically movable element, a connection between said element and the first-mentioned carrier, and a yieldable connection between said element and the lower end of the supplemental carrier.

5. The combination of a main supporting frame, a carrier pivotally mounted upon said frame, and means upon the frame for operating the carrier, said means including an element movable in a vertical plane, and a lost-motion connection between said element and the carrier.

6. The combination of a main supporting frame, a carrier pivotally mounted upon the said frame for movement in a vertical plane, means for operating the carrier including an element pivotally mounted thereon concentric with the pivot of the carrier, projections on the carrier and the said element, a coupling bolt inserted through said projections, and a spring coiled around said bolt between the projections.

7. The combination of a supporting frame, a carrier pivotally mounted thereon, means on the frame for operating the carrier including a member mounted for movement in a vertical plane, yieldable means connecting said member with the carrier and a leaf spring secured at its center upon the front side of the frame near the lower end of the same and having its end free to be engaged by the carrier.

8. The combination of a main supporting frame, a carrier mounted thereon for movement in a vertical plane, means for operating the carrier, and a supplemental carrier mounted upon the first-mentioned carrier and extending from the end thereof for

movement in a vertical plane relative thereto, said supplemental carrier being provided at its free end with rolling surfaces disposed at opposite sides of the plane of the carrier.

9. The combination of a main supporting frame, a carrier mounted thereon, means for operating the carrier, a supplemental carrier mounted upon and extending from the first-mentioned carrier, and means at the free end of the supplemental carrier whereby the supplemental carrier may be supported on but out of contact with a lower bale and will support a bale to be discharged in spaced relation to said lower bale.

10. The combination of a main supporting frame, a carrier mounted thereon, means on the frame for operating the carrier, a supplemental carrier mounted upon and extending from the end of the first-mentioned carrier and having its side members provided with arcuate portions at its free end, bale-supporting rollers carried by the supplemental carrier at points in advance of its free end, and similar rollers mounted one at the extreme free end of the supplemental carrier and another midway the arcuate portions of said supplemental carrier whereby said last-mentioned rollers will be disposed at opposite sides of the longitudinal plane of the supplemental carrier.

11. The combination of a main supporting frame, a carrier mounted thereon, a supplemental carrier pivotally connected to and extending from the main carrier, means on the main frame for operating the carrier including a rack coupled to the main carrier, and a contractile spring connecting said rack with the supplemental carrier.

12. The combination of a main supporting frame, a carrier mounted thereon, gearing mounted on the main frame and operatively connected with the carrier, said gearing including a driving shaft and means for rotating said shaft, a ratchet fixed on the driving shaft, a pawl pivoted adjacent the ratchet to engage the same, and a releasing lever fulcrumed concentric with the pawl and provided with a lug to engage under the pawl whereby to release the same.

13. The combination of a main frame, a carrier mounted thereon, gearing mounted on the frame and operatively connected with the carrier, said gearing including a driving shaft and means for rotating the same, a brake drum fixed upon the driving shaft, a rocker mounted upon the frame adjacent said drum, a brake band encircling the drum and having its ends secured to said rocker at opposite sides of the fulcrum thereof, a foot lever fulcrumed upon the frame below said rocker, means for holding said lever normally raised, and a link connecting said lever with the rocker.

14. The combination of a main frame, a carrier mounted thereon, gearing mounted upon the main frame and operatively connected with the carrier, said gearing including a driving shaft and means for controlling the movement thereof, spaced lugs fixed upon the driving shaft, a collar loosely fitted upon the driving shaft in juxtaposition to said lugs, and a driving crank pivoted upon said collar and having an angular end adapted to engage between the said spaced lugs.

In testimony whereof I affix my signature.

ELVIS L. BARNES. [L. S.]