

July 5, 1938.

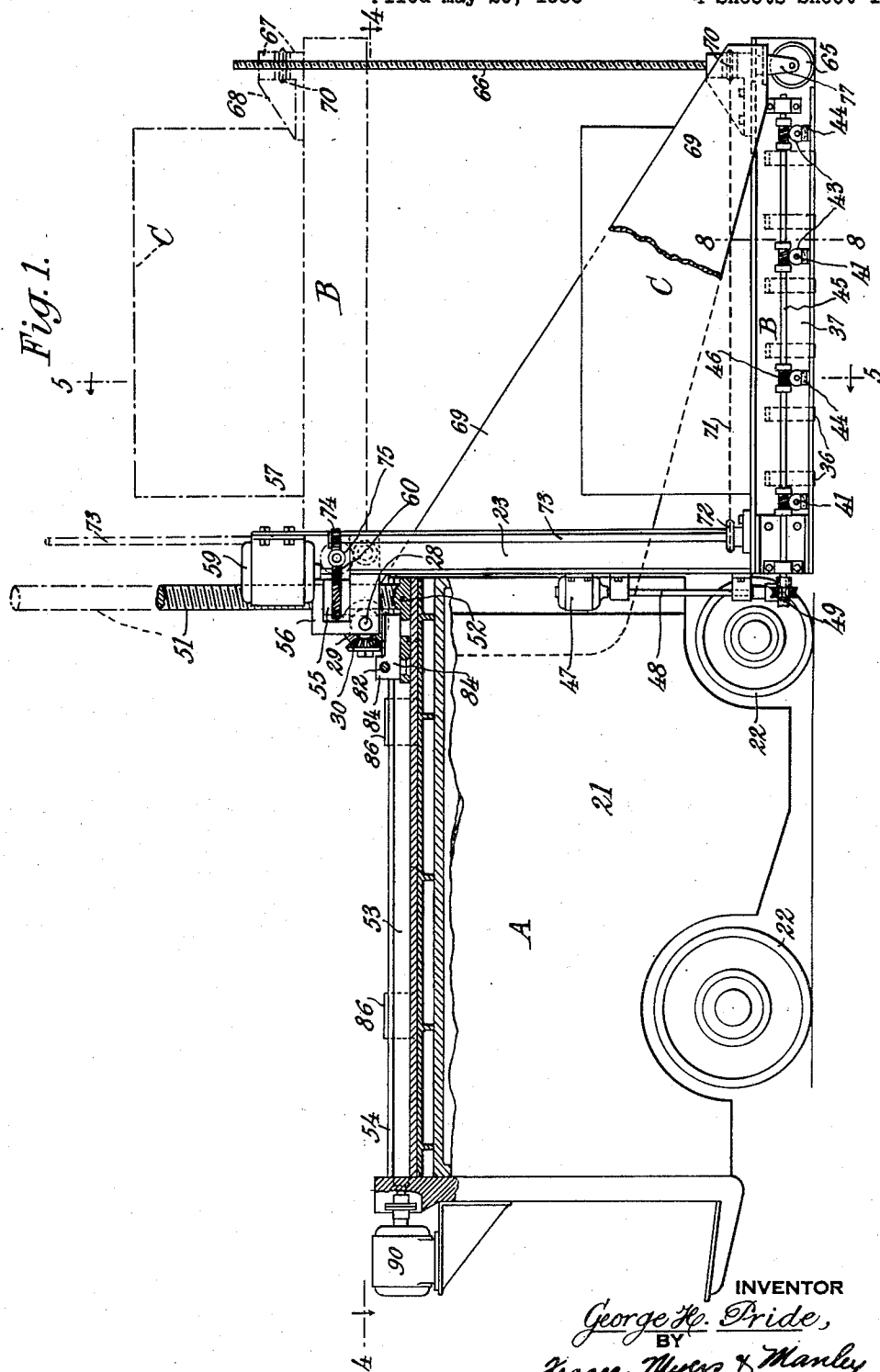
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2,122,992

LIFT TRUCK OR THE LIKE

Filed May 20, 1936

4 Sheets-Sheet 1



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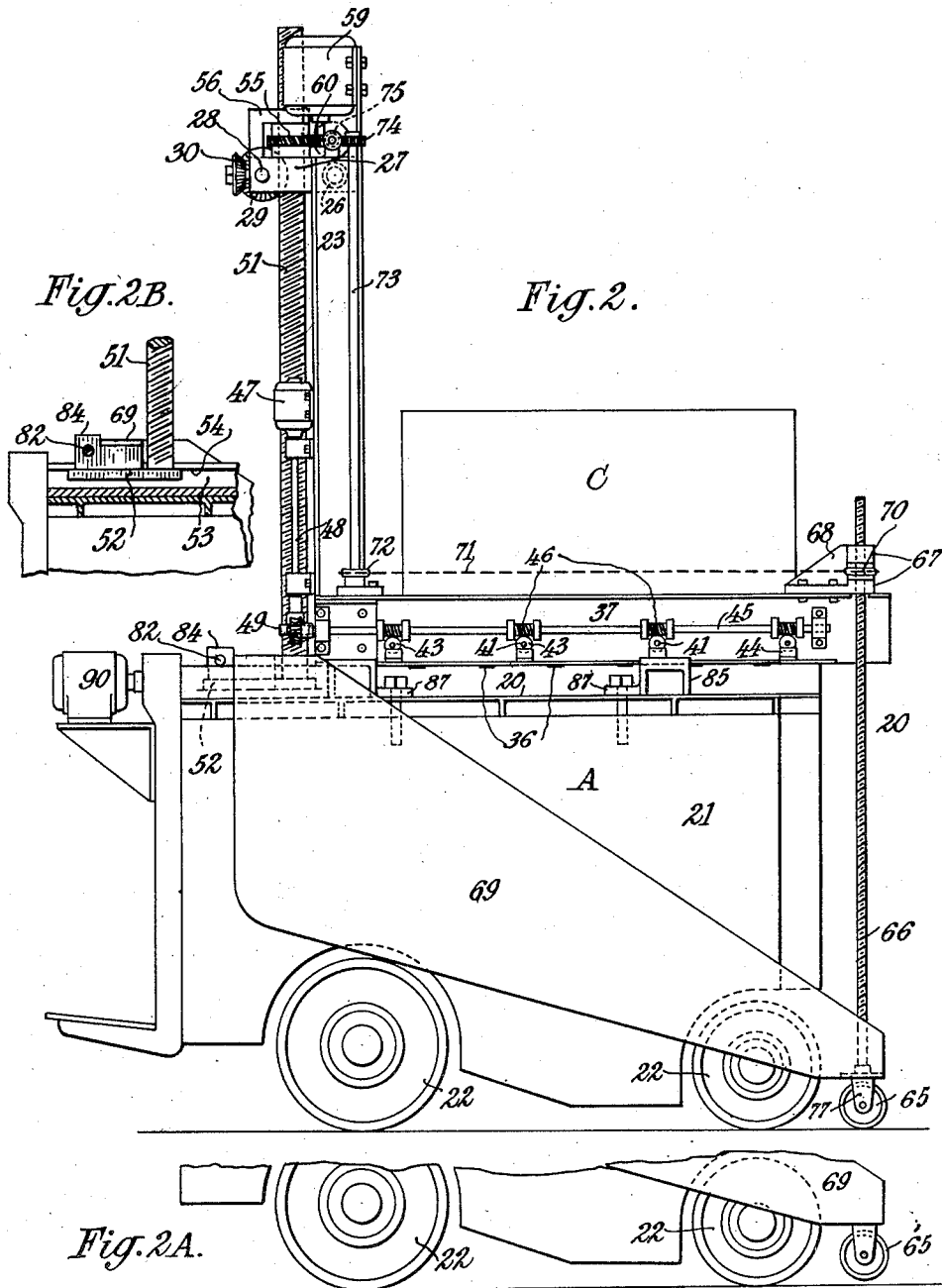
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LIFT TRUCK OR THE LIKE

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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

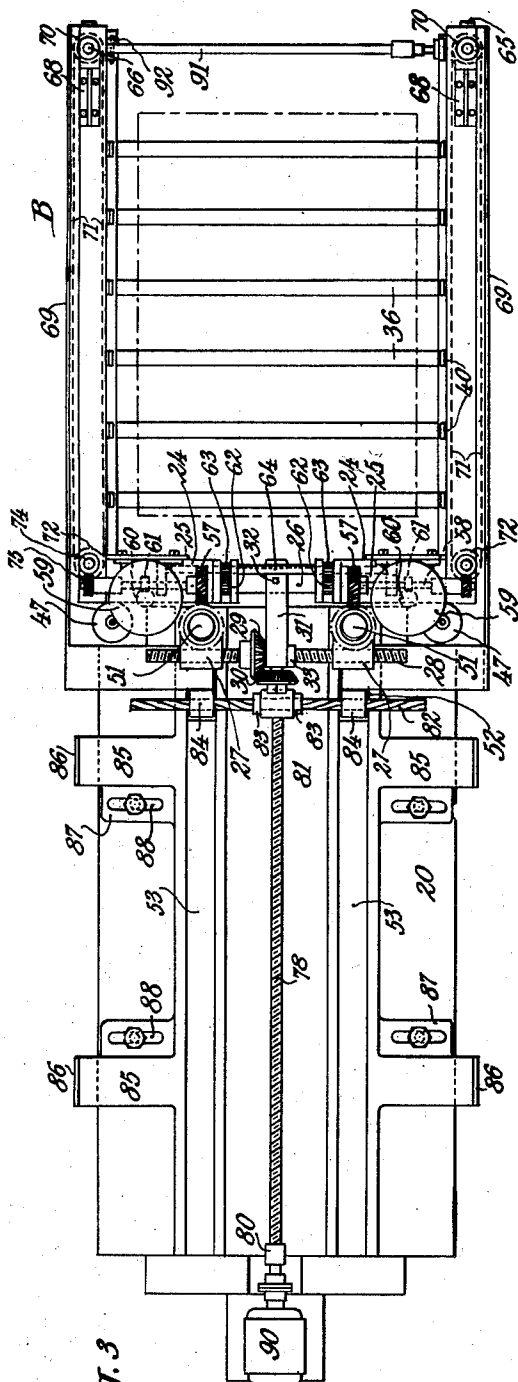


Fig. 3

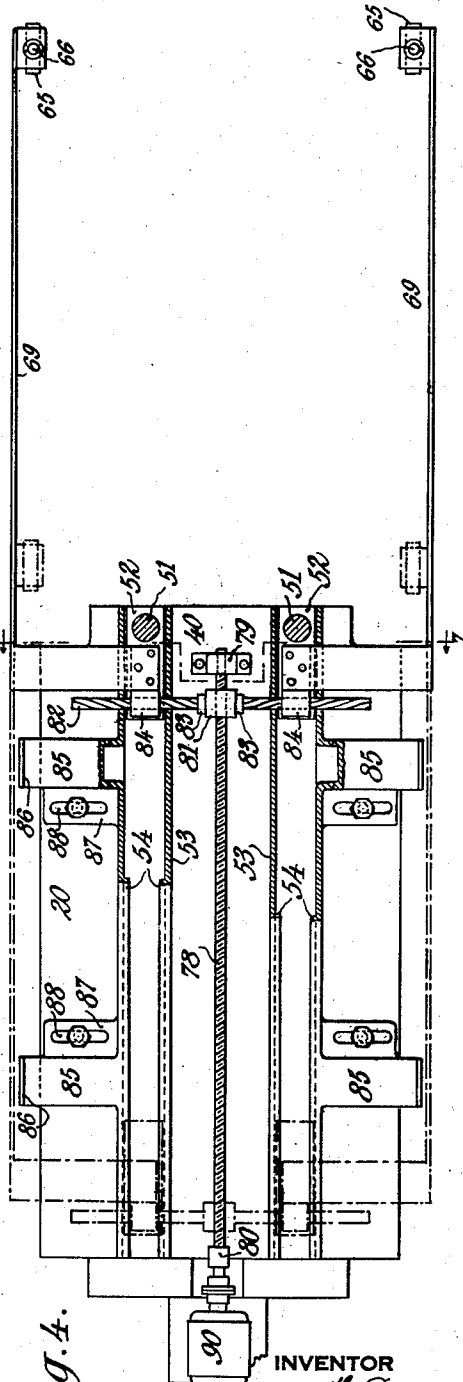


Fig. 4.

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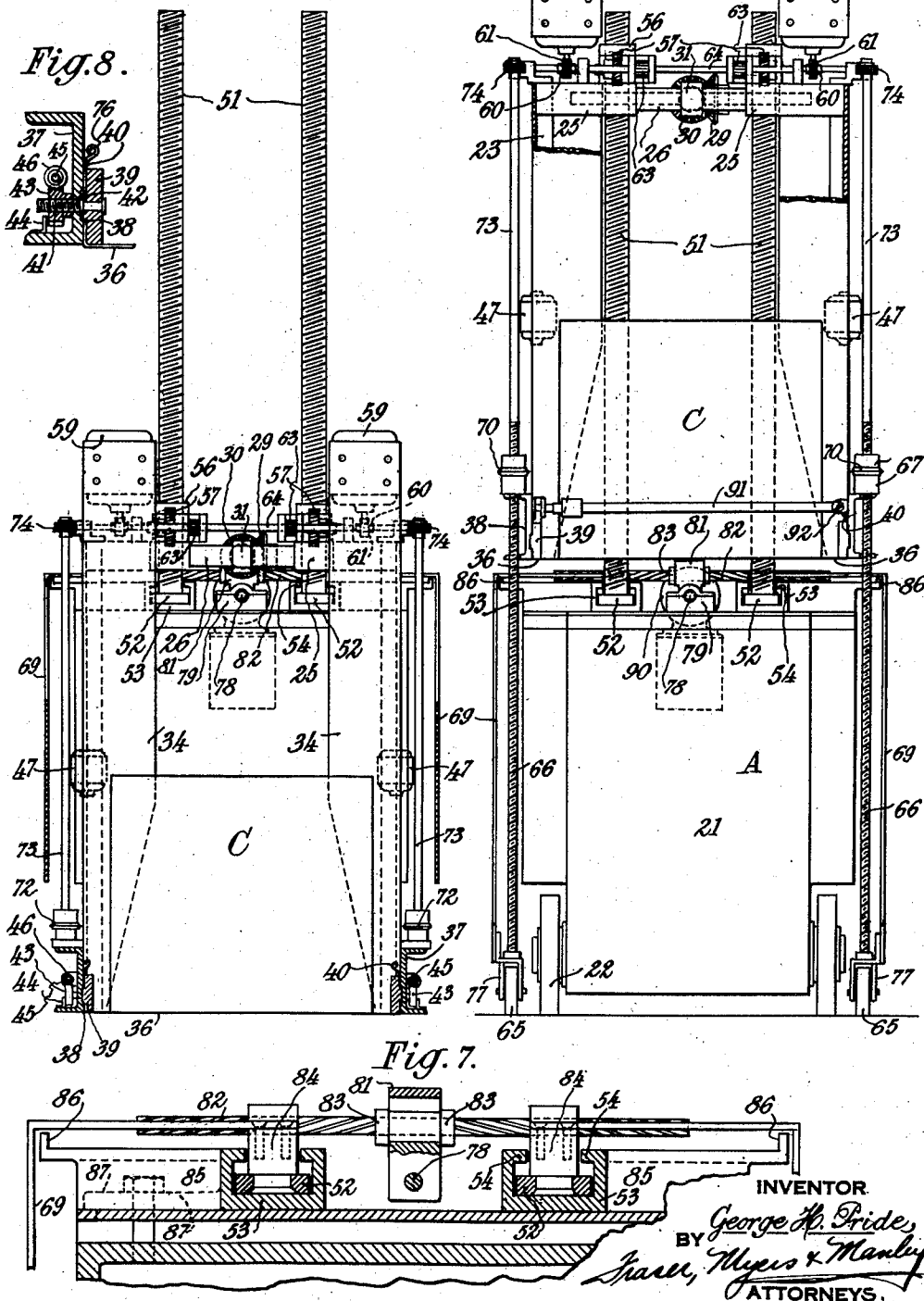
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Fig. 5.

Fig. 6.

Fig. 8.



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UNITED STATES PATENT OFFICE

2,122,992

LIFT TRUCK OR THE LIKE

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Application May 20, 1936, Serial No. 86,687

17 Claims. (Cl. 214—65)

This invention relates to improvements in lift trucks, and more particularly to those suitable for handling stacked material such as stacks of paper, cardboard or sheet steel. It may be embodied in trucks for lifting such stacks from a floor or other supporting surface, conveying them from one place to another, and for elevating such stacks to a suitable height and depositing them upon similar stacks of material which have previously been positioned upon a floor or other supporting surface in a storage space.

Trucks which have heretofore been used for such purposes have certain serious drawbacks which have been eliminated by my present invention.

One serious drawback of prior structures is that they are of such large over-all dimensions that they may be maneuvered only in relatively large aisles, and then only with considerable difficulty. An important object of my invention is to provide a truck which may be maneuvered in relatively narrow aisles and which may deposit its load in close proximity to previously stacked material.

Another serious drawback of many prior structures is that their load platforms, disposed beyond the wheels at one end of the truck, derive their sole support through the truck itself, wherefore, it has been necessary to provide, toward the opposite end of such trucks, counterbalancing weight sufficient to counterbalance any anticipated load. This added weight is very objectionable under some conditions. It is a further object of this invention to provide such means for lifting, elevating and carrying the load that counterbalancing weight is unnecessary, and thus the combined weight of the truck and its load may be kept within practical limits.

It is a further object of this invention to provide a truck, of the character referred to, which may employ a load-carrying frame embodying the principles set forth in my Patent No. 2,036,359, dated April 7, 1936, and to arrange for the convenient operation of such frame in conjunction with the other portions of the truck.

These and other objects are achieved by my present invention, as will be apparent from the following specification, in which:—

Fig. 1 is a side elevation of the truck, showing in full lines its disposition preparatory to lifting a stacked load, and showing in broken lines the position of the carrying frame and the load after they have been elevated from the floor.

Fig. 2 is a side elevation showing the relative positions of the load-carrying frame with its

load and the body portion of the truck after the former has been mechanically moved into position onto the truck body.

Figs. 2A and 2B are detail views of portions of Fig. 2 in modified positions.

Fig. 3 is a plan view of the machine with its respective parts disposed in the position shown in Fig. 1.

Fig. 4 is a horizontal section substantially on the line 4—4 of Fig. 1, the load-carrying frame being omitted and portions being cut away for the sake of clearness.

Fig. 5 is a vertical cross-section on the line 5—5 of Fig. 1.

Fig. 6 is an end elevation of the truck as viewed from the right end of the structure as illustrated in Fig. 1 (such end being hereinafter referred to as the rear end), the load-carrying platform being shown in an elevated position.

Fig. 7 is a vertical cross-section on the line 7—7 of Fig. 4, and

Fig. 8 is a vertical cross-section on the line 8—8 of Fig. 1.

The embodiment of the invention as described and illustrated herein comprises a truck body A having a flat top 20 and skirts 21 depending vertically from the four sides thereof, a load-carrying frame B, and means for elevating said frame and moving it to a position upon the top of the truck body.

Suitable propulsion motors and batteries (not shown) may be disposed within the truck body A and the latter may be mounted upon truck wheels 22 in any conventional manner. The nature of the mounting, however, is not shown as it forms no part whatever of the present invention.

The load-carrying frame is similar in its chief aspects to the frame described and illustrated as a modified embodiment in my said patent, and comprises a telescoping closed end structure which is supported on the rear end of the truck body A, an open rear end, and substantially horizontal side members, which, with the closed end structure referred to, form a substantially U-shaped frame which may be horizontally moved into position about a load.

The telescoping closed end structure of the frame B is arranged to be at a height approximating the height of the truck body A and to be disposed thereon or slightly above said truck when the frame B is in its lowermost position. Channel-shaped uprights 23 which are somewhat longer than the height of the truck body A, extend upwardly from the sides of the frame

with their flanges extending inwardly. The upper ends of the uprights 23 on each side of the apparatus are connected together by a telescoping bridge which comprises L-shaped blocks 24, a lateral arm 25 of each of which is secured at its outer end to the upper end of an upright 23 and extends horizontally inwardly with the heel of the L disposed toward the center of said end structure of the frame, and an inner telescoping member 26, which is preferably round in cross-section and extends into bores within the lateral arms 25. Longitudinal arms 27 of the blocks 24 extend horizontally from the inner ends of the lateral arms 25 toward the forward end of the apparatus.

The adjustment of the width of the frame is effected through the medium of an adjusting screw 28, having oppositely threaded portions toward opposite ends thereof, said portions being threaded horizontally through the longitudinal arms 27 at the front ends thereof. The screw 28 is actuated through coacting bevel gears 29 and 30, the former being keyed to said screw near the center thereof and the latter being suitably mounted at the front end of a horizontal bearing block 31 through which the screw 28 extends at the forward end thereof and the telescoping member 26 extends at the rear end to prevent rotation of the said block 31 in a vertical longitudinal plane. The disposition of the bevel gear 29 at one side of the block 31 and a collar 33 fixed on the screw 28 at the other side of said block prevents lateral shifting of the latter relatively to said screw and holds the gears 29 and 30 in mesh, and a set screw 32 at the rear of the block 31, locks the telescoping member 26 against lateral shifting within the said block. The gear 30 is adapted, at its forward end, to receive a wrench for turning said gear when adjustment of the width of the frame is desired.

The frame structure is rendered substantially rigid by the provision of inwardly extending gusset plates 34 which are riveted or otherwise secured to the front and rear flanges of the uprights 23 and to the sides of the blocks 24, those on the front sides extending upwardly to the tops of the blocks 24 and those on the rear sides extending upwardly beyond said blocks to afford a mounting for other parts of the apparatus.

The sides of the frame B are similar and each comprises a channel-shaped horizontal member 37 disposed with its flanges extending outwardly and being welded, riveted or otherwise secured at its forward end to the lower end of an upright 23. The member 37 serves as a fixed clamping element having, along its inner side, a grooved clamping cheek which coacts with a complementally shaped cheek (as at 38 in Figs. 5, 6 and 8) of a horizontally movable clamping element 39 which is mounted to extend along the lower inner face of the horizontal member 37.

Means are provided for uniformly moving the clamping element 39 into and out of clamping engagement with the horizontal member 37. A plurality of screw studs 41 are welded or otherwise fixed to the movable clamping elements 39 with a threaded portion thereof extending laterally from the clamping cheek of the clamping element 39, thence through and out of holes 42 in the web of the horizontal member 37, and having internally threaded worm wheels 43 working on the portion of the said studs which extend outside of the said web. These worm wheels are restricted against inward lateral motion by the web of the side member 37 and are restricted

against outward lateral motion by angle brackets 44 fixed to the inner surface of the lower flange of the horizontal member 37. Thus when the worm wheels 43 are rotated, the movable clamping elements 39 are caused to move inwardly or outwardly, depending upon the direction of rotation.

A suitably mounted worm shaft 45 has a plurality of worms 46 fixed thereto in engagement with the worm wheels 43 and adapted to rotate the latter to operate the movable clamping elements 39 when the worm shaft 45 is turned. The worm shaft 45 may be turned by an electric motor 47 mounted on the forward side of the upright 23 and adapted to rotate said worm shaft through the motor spindle 48, and a worm and worm wheel assembly 49 rotatively connecting said spindle and the worm shaft 45.

A load C of stacked material may be disposed upon a platen comprising principally a plurality of flexible steel strips 36, of suitable tensile strength, which strips are bent upwardly along substantially parallel lines along each side of the load, forming a series of upright tabs 40, as best seen in Fig. 8. These tabs will extend upwardly between the horizontal members 37 and the movable clamping elements 39 on each side of the frame and may be engaged thereby when the frame is properly moved to a position about a load and lowered to the surface upon which the load rests. The tips of the tabs 40 are curled as at 76 to provide convex, rounded surfaces at both sides thereof, thus permitting them to freely ride over the grooved clamping cheeks of the horizontal members 37 and the clamping elements 39.

A very important feature of my invention is its facility for lifting a load which is clamped within the frame B, elevating the load to a point where the frame B is at a higher level than the top of the truck body A and then drawing the load horizontally to a position over the truck body and depositing it thereon. The means of accomplishing these functions are such that the load at all times is adequately supported and the apparatus as a whole is of such restricted dimensions that when the frame and load are resting upon the truck body it may be conveniently maneuvered in a minimum of free floor space.

Support for the frame B when it is in an elevated position is derived at the forward end of the frame from two vertically disposed, non-rotatable elevating screws 51 which extend through vertical bores in the longitudinal arms 27 of the L-shaped blocks 24. The screws 51 and their coacting mechanisms are similar on each side of the apparatus. An internally threaded helical gear wheel 55 works as a nut upon each screw 51 and is mounted upon the arm 27 and restrained, against vertical movement relatively thereto, within a cage 56 which is fixed to said arm. The gear wheel 55 meshes with and is rotated by a helical gear 57 which is keyed to a laterally disposed drive shaft 58. This shaft may be turned by an electric motor 59, to the spindle of which is fixed a worm 60 meshing with and driving a worm wheel 61 keyed to the said shaft. Spur gears 62, as best seen in Fig. 3, are keyed to the inner ends of each of the shafts 58 and mesh with similar spur gears 63, both of which are slidably mounted upon a counter-shaft 64 to rotate therewith. Thus the mechanisms for rotating both gears 55 are arranged to operate together and, hence, at uniform speeds, and either two separate motors 59 or a single motor 59 may

be used for driving said mechanisms, the driving effect in the latter case being communicated from one side to the other by means of the counter-shaft 64.

5 The lower ends of each of the elevating screws 51 may be welded or otherwise fixed to a shoe 52 which is adapted to be embraced within and to slide within a longitudinally-disposed channel-shaped runway 53 which rests upon the top of the truck body A with its flanges in an upstanding position and turned in along their upper edges as at 54 whereby the shoe 52, which is wider than the open space between the intumed portions of the runway flanges, may not become accidentally unseated from within the runway.

Each side of the frame B is similarly supported and elevated at its rear end upon a non-swiveling wheel 65 carried within a forked mounting 77 which is welded or otherwise suitably fixed to the lower end of a non-rotatable rear elevating screw 66 extending vertically through vertical bores in the jaws 67 of brackets 68 which are fixed to the upper flanges of the horizontal side members 37 at the rear ends thereof. The elevating screw 66 and the wheel 65 are restrained respectively against rotation and swiveling by a side gusset plate 69, the rear end of which is fixedly secured to the mounting of said wheel. An internally threaded sprocket wheel 70 works upon the screw 66 and is disposed between and restrained against vertical movement by the jaws 67 of the bracket 68 whereby the rotation of said sprocket wheel may cause the frame B to be raised or lowered upon the elevating screw 66. The sprocket wheel 70 is connected by a sprocket chain 71 (indicated in broken lines) to a further sprocket wheel 72, which is keyed to a suitably mounted vertically-disposed shaft 73, at the upper end of which is fixed a helical gear 74 which meshes with and is driven by a similar helical gear 75 keyed to the shaft 58 near the outer end thereof. Thus the internally threaded helical gear wheels 55 are rotated upon the elevating screws 51 and the internally threaded sprocket wheels 70 are rotated upon the rear elevating screws 66 by connected mechanisms and the various gears, sprockets and other coacting elements of such mechanism are so designed and arranged that the load-carrying frame B is at all times in a horizontal position.

50 It will be seen that, when the frame B with its load is in a substantially extreme elevated position, as indicated in broken lines in Fig. 1, the bottom of the frame and load are at a higher level than the upper edges of the flanges of the runways 53 and that there is therefore no obstruction to prevent longitudinal movement of the shoes 52 within said runways whereby to bring the frame and load into the position shown in Fig. 2. To accomplish such movement I provide an elongated screw 78, journaled at both ends, as at 79 and 80, to the top 20 of the truck body in a central longitudinal position thereon and a block 81 having an internally threaded lower portion working upon said screw and an oval-shaped laterally-extending bore in an upper portion of said block, through which bore extends a cross-bar 82, said bar being free to turn in said bore, but being suitably restrained against lateral movement therewithin as by collars 83, fixed on said cross-bar at each side of the block 81. The oval shape of the said bore, as best seen in Fig. 7, permits limited vertical movement of the cross-bar therewithin.

75 The end portions of the cross-bar 82 are spiral-ly grooved in opposite directions and extend, at

a higher level than the tops of the runways 53, into lateral bores in lugs 84 which are fixed upon the forward ends of the shoes 52 and extend upwardly beyond the runways to receive the said cross-bar. The lateral bores in the lugs 84 are interiorly grooved complementally to the grooves in the cross-bar 82 to receive the latter. The cross-bar 82, as a result of the grooves therein, rotates in response to any adjustment of the width of the frame, and, as the grooves at each end are of a similar pitch, a uniform and similar spacing is maintained between each of the runways 53 and the longitudinal center line of the truck.

Inverted channel-shaped supports 85 are fixed to the outer sides of the runways 53, and, with said runways, rest upon the top 20 of the truck body and afford support for the frame B which may be rested thereon with its load. The outer edges of the webs of these supports are flanged upwardly, as at 86, to assist in restraining a loaded frame B against lateral shifting thereon when the truck is in motion.

The supports 85 have lugs 87 with slots 88 through which may project studs 89 which are fixed into the top 20 of the truck body and extend upwardly therefrom, and which studs loosely engage said lugs and serve to guide and limit the possible lateral shifting of the runways.

The spindle of a motor 90 is connected to the forward end of the screw 78 to rotate the latter whereby to cause the block 81 to work forwardly along said screw and to draw an elevated frame B with it, through the medium of the cross-bar 82, the lugs 84, the shoes 52 and the upright screws 51 which carry the forward end of said frame. The rear ends of the side gusset plates 69 are connected to the mountings of the rear wheels 65 and their forward ends are bent horizontally inwardly along their top edges and secured to the lugs 84, as best seen in Fig. 4. Thus the side gusset plates 69 enhance the rigidity of the rear elevating screws 66 and prevent any rearward drag that might otherwise be present at the rear wheels 65 while the loaded frame B is being moved horizontally to a position over the truck body.

It will be observed that after the frame B has been lowered and has come to rest upon the supports 85 on the truck body, a brief further functioning of the motors 59 causes the vertical screws 51 and 66 to be lifted within the gear wheels 55 and the sprocket wheels 70, the screws 66 carrying the wheels 65 with them to a position above and clear of the floor, as seen in Fig. 2A. In order to permit the limited vertical movement of the forward elevating screws 51, as aforesaid, I make the bodies of the shoes 52 somewhat shallower than the inside vertical dimensions of the recesses in the runways 53, thus permitting the limited vertical shifting of the shoes within the runways and consequently also permitting the vertical shifting of the screws 51 which are fixed to said shoes. When the frame B is resting on the supports 85 and the wheels 65 have been raised from the floor, the shoes 52 will be above the lower inner surfaces of the runways 53, as shown in Fig. 2B, otherwise the said shoes will rest upon the said lower inner surfaces of the runways, as shown in the other figures. With the vertical movement of the shoes, the cross-bar 82 also moves vertically, but such movement of the latter takes place within the oval-shaped lateral bore in the block 81 without in any way 75

changing the position of said block or the screw 78 or affecting their operation.

As in the structure disclosed in my aforesaid patent, I provide a bridge member 91 hingedly mounted upon the rear end of one side of the frame B, as at 92, in such a way that it may swing in a vertical plane between an upright position in which the rear end of the frame will be completely open and a horizontal position in which the member may extend across the rear end of the frame to act as a spreader when a load is supported therein on the tensioned steel strips 36. The length of the bridge member 91 may be adjusted to conform to the adjustment of the width of the frame.

An understanding of the operation of the lift truck disclosed herein will assist in understanding the several structural features thereof and its advantages over prior devices. When the truck is being moved from place to place in a plant during the course of its usage its component parts will be in approximately the positions shown in Fig. 2, the wheels 65, however, being elevated from the floor, as shown in Fig. 2A. In this compact form the truck may be conveniently maneuvered in small spaces.

The truck may be moved to a position where-in its rear end is adjacent to one end of a stack to be lifted and moved to another location. The bridge member 91 being in an upright position so that the rear end of the frame B is completely open, said frame may be elevated clear of the supports 85 by operating the elevating motors 59. The frame may then be extended horizontally to the position shown in Fig. 1 by operating the motor 90, the said members of the frame B thereupon being located directly over the series of upturned tabs of the steel strips 36 upon which the stack was originally placed. Being sure that the clamping members in the frame are open, the frame may be lowered to the floor with said tabs extending upwardly in position to be engaged by the clamps, whereupon the bridge member 91 may be dropped to a horizontal position and the clamping members 39 closed by the operation of motors 47.

The frame with its load may then be elevated to the position shown in broken lines in Fig. 1 and then be withdrawn to a position over the truck body and lowered onto the supports 85, the elevating motors 59, however, being permitted to continue to function briefly after the load comes to rest on said supports whereby to lift the wheels 65 clear of the floor.

The truck may then be moved to the position where it is desired to discharge its load. Assuming that it is desired to deposit this load upon a lower stack of material resting upon the floor, the truck may be moved to a position where its rear end is disposed adjacent the end of said lower stack. The frame B and its load may then be elevated sufficiently to be clear of the supports 85 and to be at a higher level than the top of the said lower stack, then moved horizontally to a position directly over said lower stack, whereupon the frame and its load may be lowered to a position where the load rests upon the lower stack. Thereupon the clamps 39 may be opened, the bridge member 91 moved to an upright position and the frame B withdrawn horizontally, then lowered to rest upon the top of the truck, which will then be ready for further usage.

It will be understood that my apparatus may be used to engage a load which has been previously stacked upon another stack of material

and also that it may discharge its load directly upon the floor, if desired. It is, of course, further understood that all loads to be handled by apparatus having the particular type of load-carrying frame disclosed herein must be disposed upon steel strips of the character described herein or upon some other similar flexible load support which will function with the clamping means provided in this apparatus.

It will be apparent that my invention may be employed in a variety of ways. The invention may be employed, for example, in apparatus wherein hydraulic or other means are used for elevating and lowering the load; various types of load supports may be employed, other than the frame B disclosed herein; the truck body may be lower than illustrated in the drawings; a large variety of clamping means are available; rollers or equivalent means may be employed instead of the slide shoes disclosed herein; and the electrical equipment may be so arranged that fewer motors would be needed. These and other changes not enumerated herein may be made without departing from the spirit of the invention as defined in the appended claims.

What I claim is:

1. A lift truck or the like, comprising a mobile body, an elevating load-carrying support coacting with said body and means for elevating and substantially horizontally moving said support to a position over said body, the said load-carrying support, when elevated, being supported at one side thereof upon said body and at a substantially opposite side thereof upon a floor or similar surface independent of said body, whereby to maintain said load-carrying support in a substantially stable condition at all times.

2. A lift truck or the like, comprising a mobile body, and a load-carrying support adapted to be elevated and lowered and further adapted, when in an elevated position, to be substantially horizontally moved relatively to said body between a position substantially over said body and a position wherein the said support is substantially extended beyond said body, the said load-carrying support, when elevated, being supported at one side thereof upon said body and at a substantially opposite side thereof upon a floor or similar surface independent of said body, whereby to maintain said load-carrying support in a substantially stable condition at all times.

3. A lift truck or the like according to claim 2, wherein the load-carrying support has means coacting therewith at opposite ends thereof for elevating said support and for maintaining it in a substantially horizontal position.

4. A lift truck or the like according to claim 2, wherein one end of the load-carrying support is supported upon the mobile body and the opposite end thereof is supported independently of said body, the supporting means for the former end comprising a member adapted to be moved, with the load-carrying support, in substantially horizontal directions relatively to the body of said truck.

5. A lift truck or the like, comprising a mobile body, a runway carried on the top of said body, a shoe adapted to work along said runway, a substantially U-shaped load-carrying frame having members at the open and closed ends thereof adapted for supporting and elevating said frame, the said members at the open end affording such support independently of said body and one of said members at the closed end being mounted upon and coacting with said shoe whereby, when

the frame is in an elevated position and the shoe is moved along said runway, the frame is caused to move horizontally relatively to said body.

6. A lift truck or the like, comprising a mobile body, a movable member adapted to be moved horizontally along the top of said body, a load-carrying support supported partly by said body and partly independently thereof and having members at opposite ends thereof adapted to elevate said support, one of said members, disposed at one end of the support being mounted upon said movable member, whereby, when the frame is in an elevated position and the said movable member is moved along the top of the body, the load-carrying support is caused to move horizontally to a position over said body.

7. A lift truck or the like according to claim 6, wherein the members adapted to elevate said load-carrying support are jackscrews.

8. A lift truck or the like according to claim 6, wherein the members adapted to elevate one end of the load-carrying support coact with said support and the floor to achieve such elevation independently of the truck body, and have wheels at the lower ends thereof working on the floor to facilitate the horizontal movement of the said support.

9. A lift truck or the like according to claim 6, having screw means, connected to said movable member and adapted to move said member along the top of the truck body.

10. A lift truck or the like comprising a mobile body having a substantially flat top, runways resting in relatively parallel positions on said top and restrained against substantial longitudinal shifting while being free to shift laterally to a limited extent, shoes working along said runways, an adjustable load-carrying support, jackscrews on opposite sides of the support for elevating said support, said jackscrews at one side of the support being fixed at their lower ends to said shoes and the said jackscrews at the other side of the support having wheels at the lower ends thereof to facilitate horizontal movement of the support, an elongated screw rotatably mounted centrally on the body top in a position substantially parallel to runways on each side of said elongated screw, a block working as a nut on said elongated screw and having a cross-bar extending laterally therethrough and engaging said shoes whereby when the said support is in an elevated position it may be moved horizontally relatively to the truck body by the rotation of said elongated screw.

11. A lift truck or the like, comprising a substantially flat body top, an elongated screw rotatably mounted thereon, runways resting on said top at both sides of said screw and substantially parallel thereto and being restrained against substantial longitudinal shifting while being free to shift laterally to a limited extent, shoes adapted to work along said runways and restrained against substantial lateral movement relatively thereto, an adjustable load-carrying support which, at a plurality of relatively variable points thereon, is fixed to said shoes in runways at opposite sides of said screw, and means, coacting with said screw, for moving said shoes along said runways and for varying the relative positions of the runways to correspond with the variations in the size of the adjustable load-carrying support and for maintaining substantially uniform spacing between said screw and the runways on opposite sides thereof, said means comprising a block working as a nut on said screw, a cross-bar ex-

tending laterally through said nut and being adapted to freely rotate therein and being further restrained against lateral shifting therewith in said cross-bar having end portions oppositely grooved at a similar pitch, said end portions extending from each side of said block into and working within complementally grooved bores in said shoes on opposite sides of the screw, whereby any adjustment of the size of the load-carrying support operates to correspondingly move the said shoes and turn the cross-bar working therein, the opposite grooves in said cross-bar serving to maintain uniform spacing between the screw and the runways which are carried laterally with said shoes.

12. A lift truck or the like according to claim 11, wherein the cross-bar extends through an oval-shaped lateral bore in said block, the largest diameter of said bore being vertical whereby to permit limited vertical shifting of the cross-bar within the block.

13. A lift truck or the like, comprising a substantially flat body top, a runway thereon, a shoe working in and along said runway, a load-carrying support, jointly operable jackscrews at opposite sides of said support for vertically moving the latter between an elevated position and a position wherein the support is at rest upon said top or upon a floor, the jackscrews at one side of the support having wheels fixed thereto to work along a floor, a jackscrew at the other end of the support being mounted upon and fixed to said shoe, the shoe being capable of restricted vertical movement within the runway whereby to permit sufficient continued functioning of the jackscrews, after the support has been lowered to the body top or to the floor, to cause the said wheels to be raised clear of the floor.

14. In a load-carrying support having clamping members with complementally grooved clamping cheeks, load-supporting means comprising a flexible member of sufficient tensile strength to support an anticipated load, said member having a portion adapted to be inserted between said cheeks preliminary to being clamped therebetween and the movement incident to such insertion being substantially perpendicular to the grooves in the cheeks, the leading edge of said portion being enlarged and convexly rounded at both sides thereof to permit it to ride over the grooves in said cheeks.

15. A lift truck or the like, comprising a mobile body, an elevating load-carrying support coacting with said body and supported, at one side, upon said body and supported, at a substantially opposite side, independently of said body, and means for elevating and substantially horizontally moving said support to a position over said body, said support having a load-receiving portion within the points of support thereof and being adapted to move such load to a position substantially within the points of support of said mobile body, whereby to maintain such load in a substantially stable condition at all times during its association with said truck.

16. A lift truck or the like, comprising a mobile body, an elevating load-carrying support coacting with said body and supported, at one side, by said body and, at a substantially opposite side, independently of said body in a substantially horizontal position, means for uniformly elevating said apparatus at substantially opposite supporting points and means for substantially horizontally moving said apparatus, when elevated, to a position over said body, the body and the load-

carrying apparatus being connected and substantially restrained against relative vertical rotation, whereby the stability of each the body and said apparatus may augment the stability of the other.

17. A lift truck or the like, comprising a mobile body, a load-carrying frame, a cradle movably supported at one end upon a floor or similar surface and movably supported at a substantially opposite end upon the truck body, elevating supports at opposite parts of the cradle coacting with

the load-carrying frame whereby to support and elevate said frame, and means for substantially horizontally moving the cradle, and the frame supported thereby, in a substantially straight line relatively to the body when the frame is in an elevated position, the parts of the cradle being so arranged that they are clear of the truck body during the relative horizontal movement of the latter and the cradle.

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