

Dec. 7, 1965

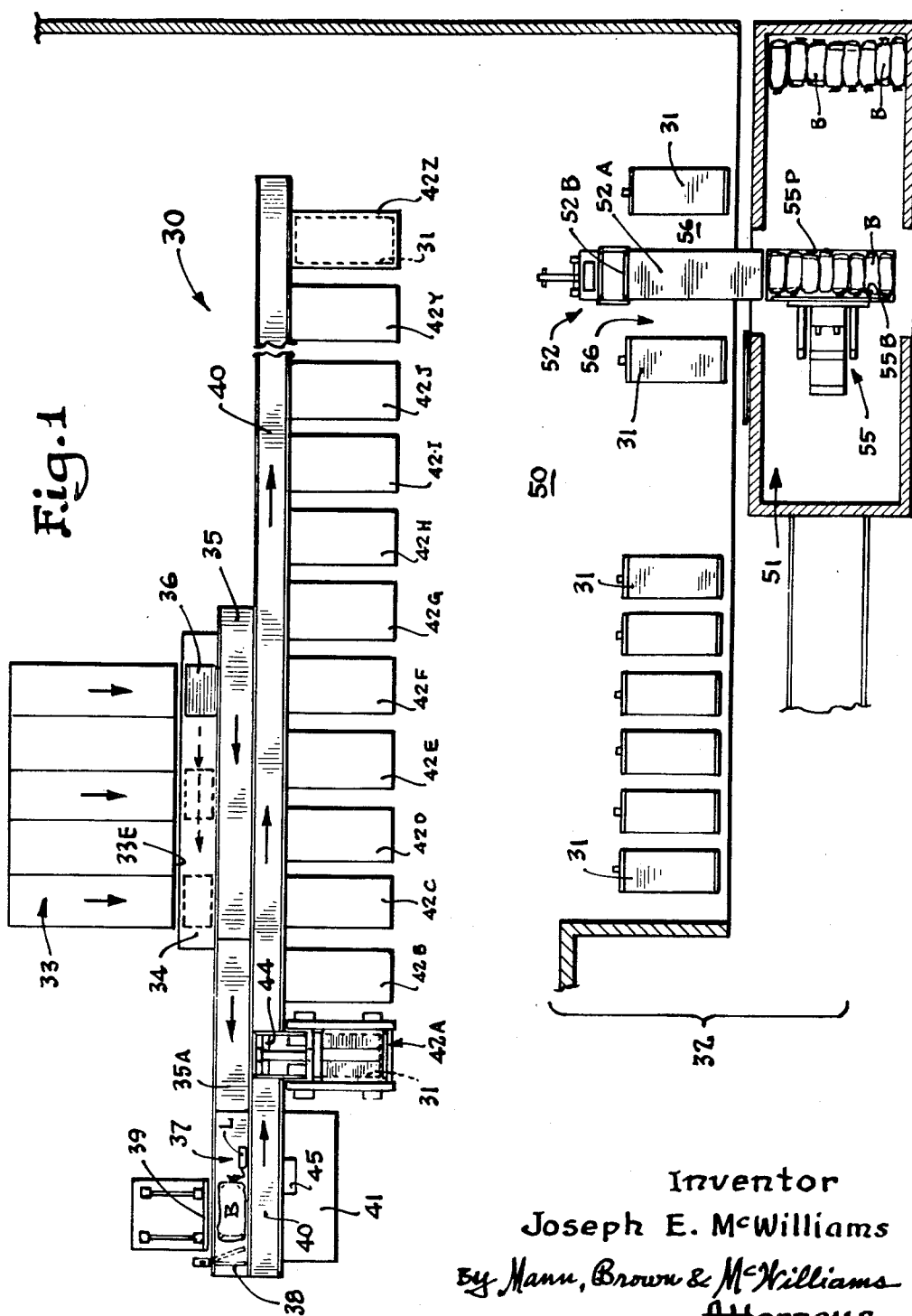
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3,221,912

LIFT TRUCK ARRANGEMENT FOR SYSTEM OF HANDLING BAGGED MAIL

Original Filed Sept. 20, 1961

6 Sheets-Sheet 1



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6 Sheets-Sheet 2

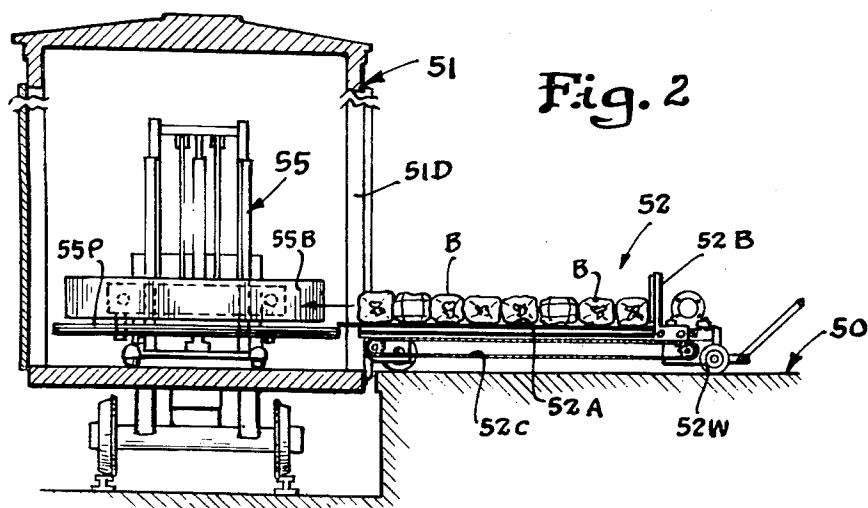


Fig. 2

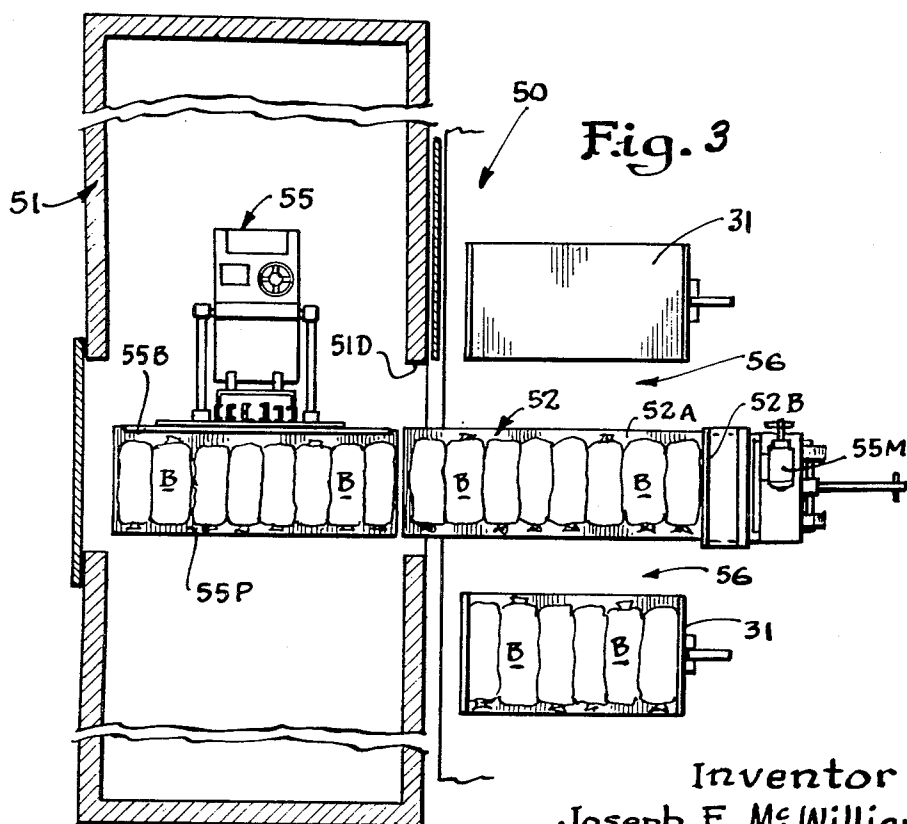


Fig. 3

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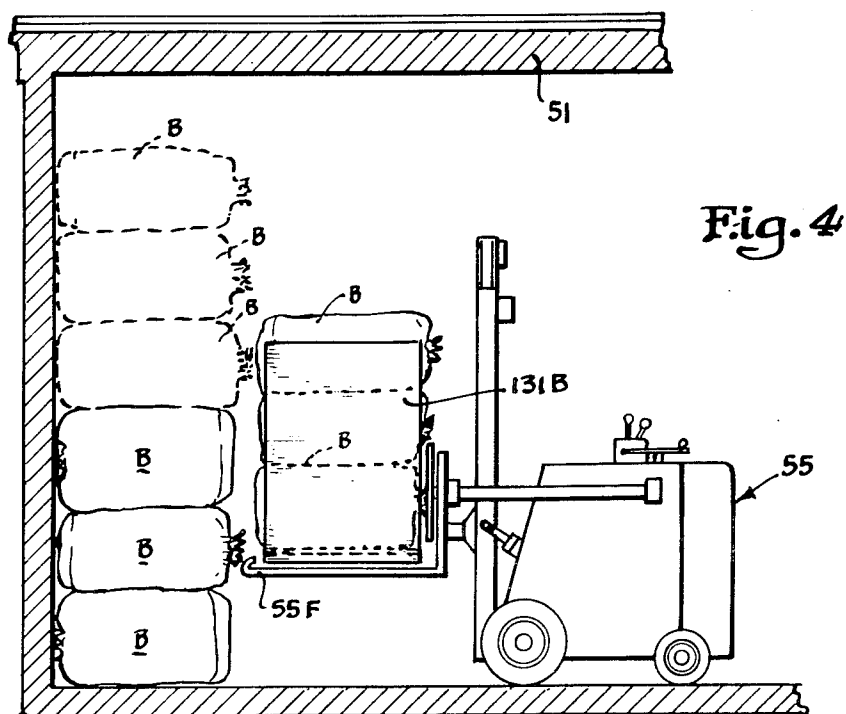
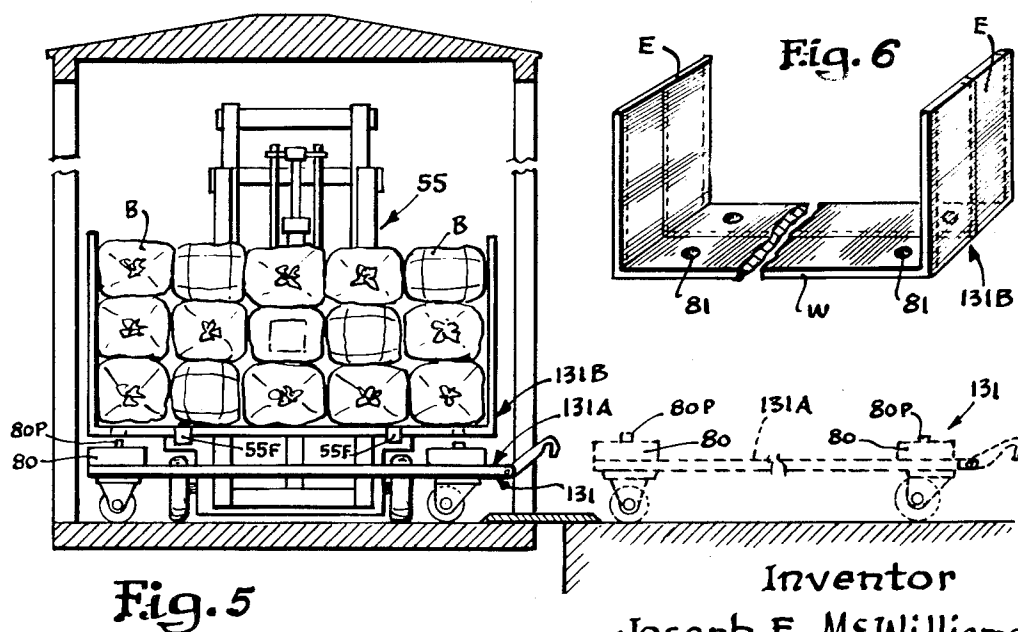
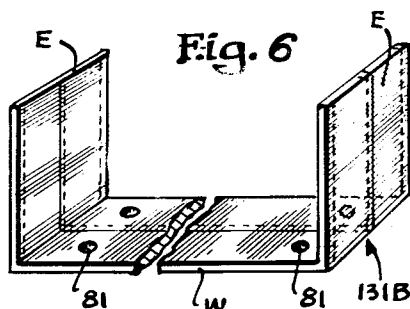
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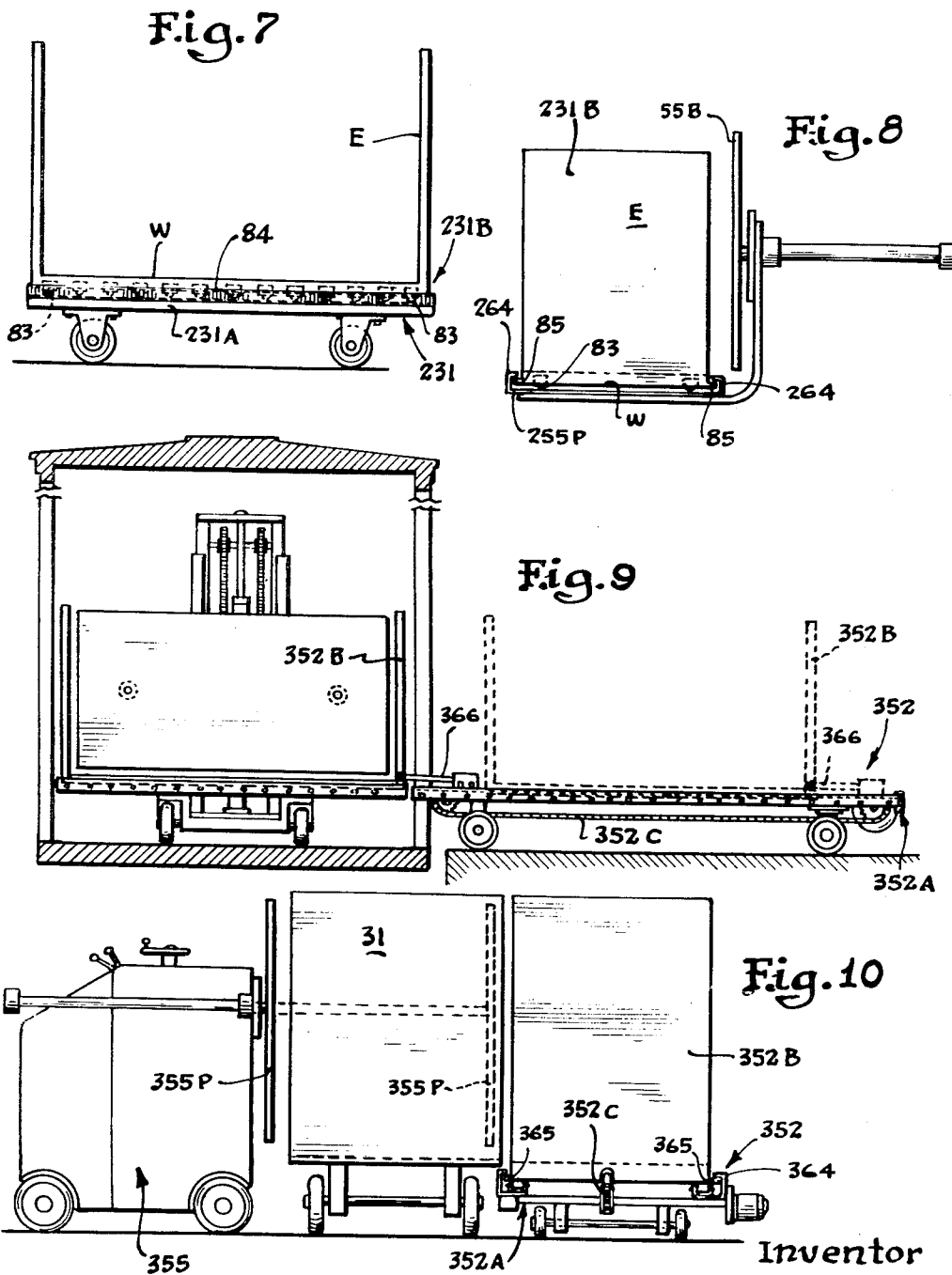
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6 Sheets-Sheet 5

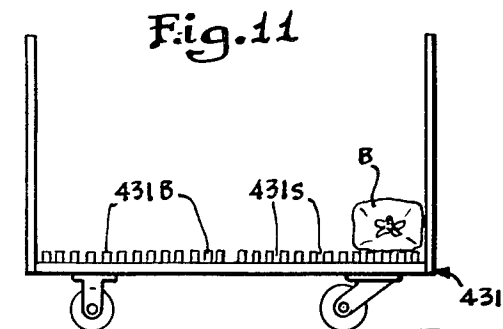
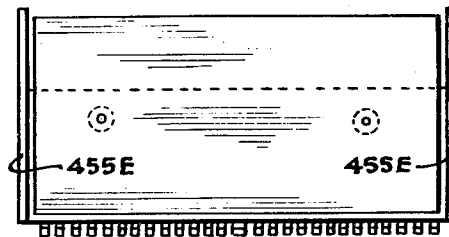
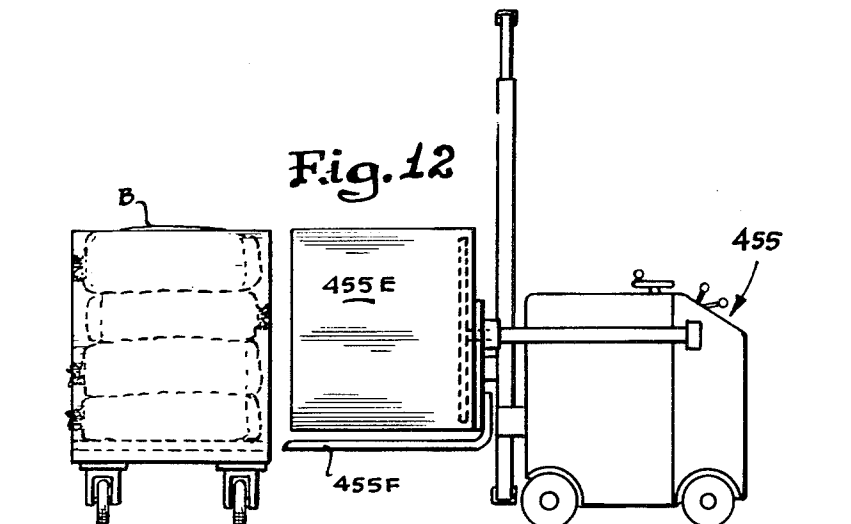
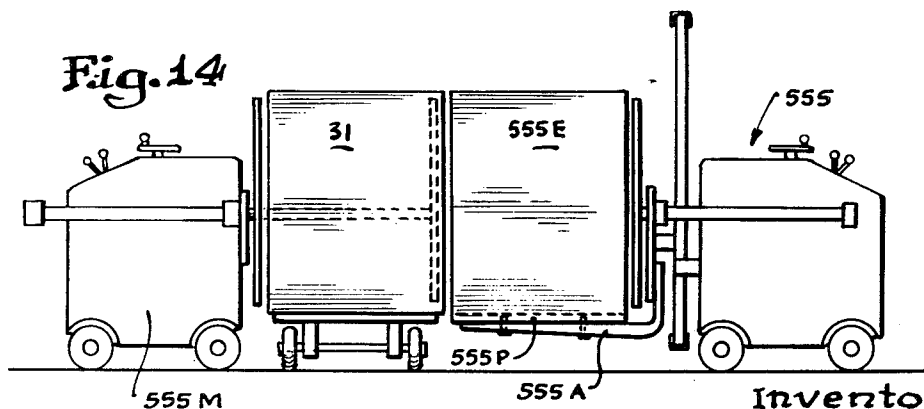


Fig. 13



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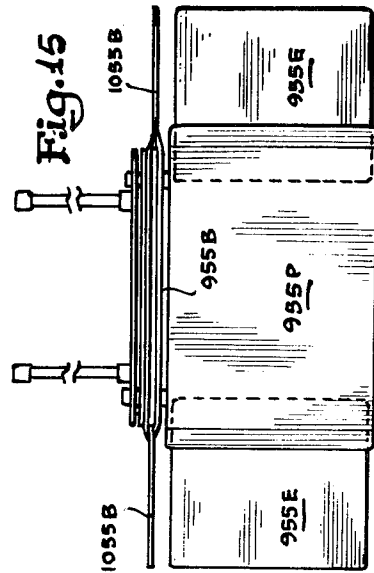
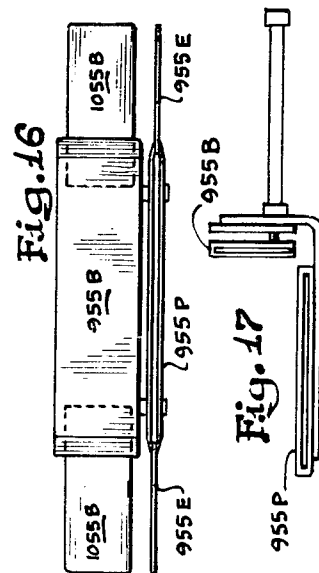
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LIFT TRUCK ARRANGEMENT FOR SYSTEM OF HANDLING BAGGED MAIL

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6 Sheets-Sheet 6



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LIFT TRUCK ARRANGEMENT FOR SYSTEM OF HANDLING BAGGED MAIL

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Original application Sept. 20, 1961, Ser. No. 139,526, now Patent No. 3,164,271, dated Jan. 5, 1965. Divided and this application Dec. 30, 1964, Ser. No. 422,347
1 Claim. (Cl. 214—514)

This application is a division of my application Serial No. 139,526, filed September 20, 1961, now Patent 3,164,271, granted January 5, 1965.

This invention relates to the handling of loaded and tagged bags of mail in terminals and the like, and particularly it relates to a system of sorting the bagged mail as to destination, and subsequently loading the bags into the carrier or transport bodies. The present application is directed to the lift truck arrangement for use in connection with said system.

The post office department pays carriers of bulk mail in bags on a cubic foot basis, and for purposes of economy the postal authorities require that bulk mail loaded in railway cars, motor trucks or trailers be loaded in a particular manner so as to fully utilize the capacity or volume of the transport body up to the maximum height to which the bags may be lifted by the workers in stacking. This loading may differ somewhat according to the type of carrier or transport body that is being used, but in general the bags are laid down in tiers that run transversely of the length of the transport body with the length of the bags extending longitudinally with respect to the transport body. Variations in bag loading of course cause variations in width of the loaded bags, but regardless of these variations, the bags are snugly related to each other in each tier, and successive tiers are placed one upon the other until the stack reaches the internal height of the transport body. This general plan, in the case of side loading bodies, such as railway cars, is modified in the area between the two doors so that the tiers and stacks run lengthwise of the body with the length of the bags extending transversely of the transport body.

The requirement that the transport bodies be loaded compactly according to the general plan above outlined has constituted one element in complicating and increasing the cost of sorting, handling and loading bagged mail, and in the entire sorting, handling and loading process, the tiring manual effort required has long been considered to be objectionable. Thus in the handling system heretofore provided, the operations have been broadly considered as falling into a series of incoming operations and a series of outgoing operations, all of which have involved tiring and time-consuming manual operations, many of which were repeated many times in the course of the entire operation. Generally considered, the incoming operations have constituted the accumulation of bags on sorting floors, and sorting of these bags and loading the same on hand trucks in loads for subsequent reloading onto particular outgoing carriers, and then moving the loaded hand trucks to a temporary storage area. The outgoing operations comprise the moving of the loaded hand trucks to the dock area and into positions that may be

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required for transporting the bags into the transport body, and then transferring and stacking the bags in the transport body.

More specifically with relation to the incoming operations, the bags are dumped onto the sorting floor in random piles, and these sorting floors are relatively large with trucks of one kind or another positioned around the sorting floor. In some instances there may be as many as ninety trucks about the sorting floor to provide for the destinations that may be included in the bags that are supplied to the sorting floor, and of course in such an instance, many of the trucks may be positioned from 100 to 150 feet from the point where a bag is located on the sorting floor. The worker, in sorting and loading the bags onto the proper hand trucks must stoop down and grasp the bag cords and read the destination tag that is attached to the cord. The bag must then be carried or dragged to the proper hand truck, and the worker must then stoop down and grasp the bag so as to lift the bag into position on the hand truck. This loading operation must be carried on carefully in order to assure that the stacked bags will remain in position on the truck when it is subsequently moved. The worker must then walk back to the sorting floor and repeat this operation. As the stacks of bags on the truck becomes higher, greater effort is of course involved, and this is particularly tiresome where the bags are loaded up to or beyond the allowable maximum of eighty pounds.

In the outgoing operations, the unloading of the bags from the hand trucks and the carrying or dragging of these bags into position in the carrier body for stacking according to the loading plan above described, involves further manual work that is extremely tiresome, and throughout all of these handling operations in both the incoming and outgoing portions of the work, there is a repetition of the orienting movements as the bag is oriented into position on the hand trucks and subsequently as it is oriented in placing it in position in the tiers of the transport body.

In view of the foregoing it is the primary object of the present invention to provide an improved system for handling, sorting and loading bagged mail, and to do this in such a way that walking, stooping and lifting are minimized and in such a way that time losses are reduced. Another and related object of this invention is to provide a system of the foregoing character wherein the loaded mail bags are oriented early in the cycle of operations, and in which this initial orientation is maintained throughout all of the subsequent handling operations so as to thereby reduce the physical effort and the time that has heretofore been required in respect to the orientation of the bags.

Another important object of this invention is to provide for use in connection with my system a novel lift truck arrangement for use in loading sorted bagged mail in transport vehicles in which the effective load carrying width of the truck laterally thereof may be extended beyond the normal lateral boundaries of the truck.

Other and further objects of the present invention will be apparent from the following description and claim, and are illustrated in the accompanying drawings, which, by way of illustration, show preferred examples of the present invention and the principles thereof, and what is now considered to be the best mode in which to apply these

principles. Other embodiments of the invention embodying the same or equivalent principles may be made as desired by those skilled in the art without departing from the invention.

In the drawings:

FIG. 1 is a plan view schematically illustrating the mail bag handling and sorting system of the invention and illustrates the over-all system disclosed in my said Patent No. 3,164,271;

FIG. 2 is a transverse section through a carrier or transport body in the form of a railway car and illustrating the way of which mail bags are moved into and then stacked in the proper relationship within the car;

FIG. 3 is a plan sectional view of the structure shown in FIG. 2;

FIG. 4 is a view illustrating the way in which bags are loaded into an end loading truck body and showing an arrangement for loading several tiers of bags at one time;

FIG. 5 is a transverse sectional view showing the hand truck structure of FIG. 4 as utilized for loading several tiers of bags in a car at one time;

FIG. 6 is a perspective detail showing the truck body utilized in the loading operation shown in FIGS. 4 and 5;

FIG. 7 is a side elevational view of a different form of hand truck;

FIG. 8 is a view showing the lifting and pusher mechanism adapted for use in connection with the hand truck in FIG. 7;

FIG. 9 is a cross sectional view of a railway car showing the use of an assembler type of hand truck for loading the car in balanced stacks;

FIG. 10 is an end elevational view showing the system for loading the assembler of FIG. 9;

FIG. 11 is a side elevational view of another form of hand truck;

FIG. 12 illustrates the way in which a load of oriented bags is removed from the hand truck of FIG. 11;

FIG. 13 is a front elevational view of the lifting and pushing structure of the lift truck of FIG. 12;

FIG. 14 is an elevational view illustrating the way in which a conventional hand truck may be unloaded onto the lift platform of the lift truck;

FIG. 15 is a plan view of an extensible platform and pusher structure for the lift truck;

FIG. 16 is a front elevational form of the structure shown in FIG. 15; and

FIG. 17 is a side elevational view of the structure shown in FIG. 16.

The system in general

For purposes of disclosure the system of the present invention has been schematically illustrated in FIG. 1 to show the various operating steps and apparatus whereby loaded and labeled mail bags B may be sorted and loaded with increased efficiency. In FIG. 1 the broad characteristics of the system are illustrated, and specific details of apparatus relating to the transfer of the bag from hand trucks to a transport vehicle (such as a railroad car) are shown in other views and will be described hereinafter. In general the system comprises an incoming section 30 in which the random assortment of loaded bags is sorted as to destination and loaded in predetermined oriented relation on conventional sideless hand trucks 31 allocated to the respective destinations, and a storage and loading section 32 in which the loaded hand trucks 31 are accumulated and temporarily stored and are thereafter loaded into the transport body of a truck or railway car.

Thus, with respect to the incoming section 30 of the system, an initial gathering area 33 is provided on which a random assortment of loaded and labeled mail bags B may be deposited from trucks, conveyors and the like, and the bags B are moved across the area 33, due for example to floor slope, or by conveyors, to one edge

33E of the area 33 that borders one side of a depressed walkway 34. Along the other side of the depressed walkway 34, a transfer conveyor 35 is extended at a level somewhat lower than the level of the edge 33E, and a worker stationed in the depressed walkway 34 may thus grasp a bag B from the adjacent portion of the area 33 and may transfer the bag across the walkway 34 and onto the conveyor 35 in a predetermined oriented relation with respect to the conveyor. Such transfer and orientation are accomplished without lifting the bag B, and by provision of a sloping, movable transfer bridge 36 extended across the walkway 34, the exertion involved is confined to the dragging effort required to start the transfer and turn or orient the bag B as it is deposited on the conveyor 35.

The oriented bags B are advanced or carried by the conveyor 35 so as to be moved one by one into a transfer station 37 where a trip member 38 that is engaged by the leading bag stops the conveyor 35 with the leading bag B in substantially a predetermined relation to a pusher 39. This pusher 39 is thereafter operated as will be described to push the bag off of the conveyor 35 and onto an adjacent distributing conveyor 40. The distributing conveyor 40 is of the step-by-step kind, and as shown, moves in a direction opposite to the direction of the conveyor 35. When the conveyor 40 stops with a bag B positioned opposite the pusher 39, and with the trip member 38 actuated, the pusher 39 operates through forward and return strokes to transfer the bag B to the conveyor 40. With the trip member 38 in released condition the return of the pusher 39 to its retracted position, again starts the conveyor 35. In the transfer of the bag B to the conveyor 40 the originally established orientation of the bag B is maintained, and the destination tag L of the bag B may be readily and easily examined by an operator working at a routing station 41 adjacent the transfer station 37 and along a portion of the conveyor 40.

The distributing conveyor 40 extends or travels past a succession of collecting stations 42A to 42Z, allocated respectively to different destinations that may be included among the bags B that are to be sorted and loaded, and in order that groups of bags B gathered at the respective stations 42A to 42Z may be easily discharged onto sideless hand trucks 31, the conveyor 40, and the transfer station 37 and the several collecting stations 42 are disposed in an elevated relation with respect to the floor upon which the trucks 31 rest, thus to permit gravity discharge of a gathered group of similarly oriented bags B onto a hand truck disposed beneath or within a collecting station 42. As herein shown the transfer conveyor 35 includes an inclined portion 35A which moves the bags B to the higher levels of the transfer station 37.

When a particular bag B has moved into position opposite the proper collecting station 42, a pusher mechanism 44 is operated automatically to push the bag B laterally off of the conveyor 40 and onto the collecting station, and as this is done, the originally established orientation of the bag B is maintained. The pusher mechanisms 44 at the several collecting stations 42 are rendered operative selectively by settable control means 45 located at the routing station 41 according to the destination label L carried by each bag B as it is moved through the transfer station and onto the distributing conveyor 40.

As will be described in detail hereinafter, the bags B discharged successively at a particular collecting station 42 are collected there in a uniform side by side relation until they constitute a group large enough to form a complete tier from end to end on a truck 31, and the group of bags is then discharged onto the related hand truck 31. After several tiers or groups of bags have thus been loaded on a truck 31, a new truck 31 is put in place beneath the particular station 42, and the loaded truck 31 is moved to a temporary storage

area that forms part of the storage and loading section 32 of the system.

As the fully loaded hand trucks 31 are removed from the respective collecting stations 42A to 42Z, these trucks are moved onto a relatively large storage floor 50 that constitutes a part of the temporary storage and loading section 32 of the present system. These fully loaded hand trucks 31 are of course arranged in groups on the storage floor 50 according to destination or are arranged in groups that may include several destinations which are to be loaded into a common transport body such as a railway car body 51 shown in FIG. 1.

When a sufficient number of fully loaded hand trucks 31 have been assembled to take care of the loading of a particular transport body 51, the transport body is brought into position along one edge of the area 50 which constitutes a loading platform, and the mail bags B from the several trucks 31 are put in position within the transport body 51 so as to form a compact and uniformly arranged load within the body 51. This form of loading is standard and involves the arrangement of the bags B in tiers as illustrated within the body 51 in FIG. 1, and similar tiers are arranged one upon another so as to fill the transport body from floor to ceiling.

Under the present invention this loading operation is accomplished in such a way that the manual effort involved is minimized, and is further accomplished in such a way that the manual operations are interrelated so that the minimum of help is required. Thus a bag assembler unit 52 is provided that constitutes a wheeled vehicle having a relatively long platform 52A, this platform 52A being of a length that is at least as great as the width of the transport body that is to be loaded. This dimension in almost every instance exceeds the length of the hand trucks 31, and for this reason the bags on the hand trucks 31 are transferred manually from the hand trucks 31 onto the bag assembler platform 52A, as will be described in further detail hereinafter. Once the platform 52A has been loaded with a group of bags B sufficient to form a tier across the entire width of the transport body 51, these bags are pushed off of the platform 52A endwise thereof and onto the platform 55P of a self propelled lift truck 55 that is at this time located inside of the transport body 51. This movement of the bags off of the platform 52A and onto the platform 55P is accomplished by a pusher plate 52B as will hereinafter be described. The lift truck 55 is of the general kind shown in Bomer Patent No. 2,256,454, patented September 16, 1941.

The loading of the platform 52A of the bag assembler 52 is accomplished by moving a pair of end trucks 31 into position on opposite sides of the platform 52A as shown in FIG. 1 so as to leave a walkway 56 on each side of the bag assembler 52. A worker may thus stand in each of these walkways and may shift bags B from the adjacent hand truck 31 across the walkway 56 and into position on the platform 52A. This shifting operation involves supporting the bag B as it is moved across the walkway 56, but does not involve lifting of the bag because in every instance the hand trucks 31 support the bags at or above the level of the platform 52A. Moreover, no orienting movements are involved. After a tier of bags has been assembled on the platform 52A, the pusher plate 52B is operated to push the tier B of bags from the platform 52A onto the platform 55P, and if necessary the wheeled assembler 52 may be moved endwise toward the platform 55P as required.

The self propelled lift truck 55 has the usual provision for raising and lowering the platform 55P, and for loading, this platform 55P is lowered slightly below the platform 52A. When the platform 55P has been loaded, it is raised or lowered to the approximate level at which the tier of bags is to be deposited within the transport body 51, and the truck 55 is advanced so that the platform 55P is located substantially over the position that is to be occupied by the tier of bags.

For the purpose of discharging the tier of bags from the platform 55P, the lift truck 55 has a pusher plate 55B mounted so as to move up and down with the platform 55P and for movement in a forward direction across the platform 55P. Thus after the platform 55P is in position over the location that is to be occupied by the tier of bags, the pusher plate 55B is actuated in an advancing or forward direction and the lift truck itself is moved in a rearward direction at a speed substantially corresponding to the speed of the movement of the pusher plate 55B. Through this action, the platform 55P is withdrawn from beneath the tier of the bags, and the tier of bags is deposited in the location that is desired.

Loading of side-opening transport bodies

When a sufficient number of hand trucks 31 have been loaded (as described in my said Patent 3,164,271) with respect to a particular destination, and have been accumulated on the storage floor 50, the bags B from the trucks 31 may be loaded into a transport body such as the railway car body 51 shown in FIGS. 1, 2 and 3. Such loading operation is accomplished through the use of the assembler unit 52 which is in the nature of a long flat truck having wheels 52W and which is adapted to be brought into position opposite the adjacent side door 51D of the railway car body 51. The bag assembler 52 is thus put in the position shown in FIGS. 1 and 3, and two loaded hand trucks 31 are moved into position on opposite sides of the platform 52A of the assembler 52, there being a space or walkway 56 between the respective hand trucks 31 and the sides of the platform 52A. It will be recalled that the hand trucks 31 are loaded with several tiers or layers of bags, and the platform 52A is at a relatively low elevation so that it is at or below the level of any bags that may be carried on the hand trucks 31. Workmen may thus stand in the walkways 56 on opposite sides of the assembler platform 52A and may transfer bags B one at a time from the hand trucks onto the platform 52A while maintaining the original orientation of the bags B and without performing any actual lifting work. The bags B are merely supported by the workman during a horizontal movement across the walkways, or are controlled as they move angularly downwardly across the walkway onto position on the platform 52A. The bags B are arranged in a single layer or tier on the platform 52A in a sufficient number to thereafter constitute a complete tier that will extend entirely across the width of the transport body 51.

When the platform 52A has been fully loaded, the lift truck 55 is brought into a position as shown in FIG. 3 where the platform 55P of the lift truck is disposed in endwise alignment with the platform 52A, and the arrangement is such that the platform 52A is just slightly above the level of the platform 55P as shown in FIG. 2. The pusher plate 52B is then operated, and this is accomplished by operation of a reversible motor 55M on the assembler 52, and this motor drives an endless chain 52C on each side of the frame of the assembler 52. The upper run of the chain 52C is connected to the pusher 52B so that by operation of the chains 52C the pusher 52B may be advanced along the platform 52A to push tier of bags B onto the platform 55P. The pusher 52B is then withdrawn to the position shown in FIGS. 2 and 3 so that the workmen may immediately start reloading the platform 52A while the worker inside the car body 51 is putting the previous load of bags B into the proper position within the car body. This coordination of the working time of the workers inside and outside of the car 51 is important in that it avoids objectionable idle time and reduces the cost of the loading operation.

When the platform 55P of the lift truck 55 has been loaded, as described, the lift truck is driven toward the end of the car, and the platform 55P is elevated to the extent necessary. When the lift truck 55 has moved to a longitudinal point in the car where the platform 55P is

located over the position that is to be occupied by the tier of bags B, the platform 55P is lowered as far as possible toward the surface on which the particular tier of bags is to be supported, thus to eliminate the possibility that these bags may tumble and assume improper positions or orientations during the unloading operation.

When the platform 55P has thus been lowered as far as possible, the pusher plate 55B is operated so as to move forwardly across the platform 55P, and at the same time, the lift truck 55 is moved at the same speed as the pusher plate 55B in a reverse direction. These movements are timed so that the bags B on the platform 55P remain directly over the final locations that they are to have in the car. Thus the tier of bags B is dropped gently and in a uniform arrangement into position at the proper location within the car, and this is accomplished without tumbling or undesired disturbance of the orientation of the bags B.

The unloading lift truck 55 is then returned to the position and relationship shown in FIG. 3, and by this time the assembler 52A will have been reloaded so that it may be immediately operated to push another tier of bags from the platform 52A onto the platform 55P.

Loading of end-opening transport bodies

In the foregoing description, the system has been described as employed in loading side-opening transport bodies such as railway cars, but it will be evident that the same procedure may be employed in loading a rear-opening or end-opening transport body such as a motor truck. In such an instance the open rear end of the truck is backed into position adjacent the edge of a loading platform, and the lift truck 55 is disposed in alignment with the open end of the truck body so that it may run directly into the truck body after the platform of the lift truck has been loaded. In such an instance, the positioner 52 is located on the loading platform or dock beside the path of the lift truck 55. The positioner 52 may be then loaded with a tier of bags from hand trucks 31 in the manner hereinbefore described, and the positioner 52 may then be unloaded in an endwise direction to move the tier of bags into position onto the lift platform of the lift truck. The lift truck may then be run into the open end of the truck body and may be unloaded so as to stack the tier of bags in the manner hereinbefore described.

Handling of larger or multiple tier groups in loading

In the system hereinbefore described, the bags B have been loaded into the transport body one tier at a time, but where the user is willing to invest additional money in replacing the usual hand trucks 31, the entire balanced stack of bags B arranged in several tiers on a hand truck may be transferred as a unit and stacked as a unit within the transport body.

In FIGS. 4, 5 and 6, one such embodiment of the present system is illustrated. Thus in order to provide for handling and arranging the mail within the transport body in relatively large groups or balancing stacks, a special sideless hand truck 131 is provided having a wheeled base portion 131A with a separable sideless body 131B. The sideless body 131B, shown in FIG. 6, comprises a bottom wall and end walls E rigidly associated therewith. The sideless body 131B rests on cross blocks 80 near opposite ends of the wheeled base 131A, and locating pins 80P on the upper sides of the blocks 80 are arranged to enter locating openings 81 formed in the bottom wall W of the sideless body. The hand truck 131 is moved endwise off of the loading dock and through the door of the car and into position opposite the lift truck 55. In this instance the lift truck 55 is made without a platform and has a modified form of fork 55F which may be inserted in the space between the two blocks 80, thus to enable the lift truck to elevate the entire body 131B. The base 131A is then withdrawn to the position shown

in dotted lines in FIG. 5, and the lift truck 55 is advanced toward the stack of bags at the end of the car. The vertical position of the loaded body 131B is then arranged so that it is just above the location that is to be occupied by the newly arrived stack of bags, and after the body is in position over the location where the bags are to be deposited, the pusher of the truck is operated to push the bags off of the body 131B, and the lift truck 55 is backed away at a corresponding rate so that the bags drop gently into position, as for example into the dotted line bag positions shown in FIG. 4 of the drawings.

In FIGS. 4, 5 and 6, the separable hand truck body is separated from the wheeled base by a vertical movement. However, other arrangements may be employed such for example as the arrangements shown in FIGS. 7 and 8. In FIG. 7, a hand truck 231 has a wheeled base 231A and a separable sideless body 231B. In this instance, the sideless body has a plurality of anti-frictional members 83 on its lower face and may be moved endwise off of the wheeled base 231A. In this instance the base 231A has a pair of channels 84 along its opposite sides, and the upper flanges thereof are arranged to overlie laterally projecting pins 85 on the bottom wall W of the sideless body 231B. For use with trucks 231, the lift truck 55 has the same form of pusher 55P, but has a platform 255P with flanges 264 of the same form and size as the channels 84 of the truck 231. Hence the body 231B of the hand truck 231 may be pushed endwise off of the wheeled body 231A and into position on the platform 255P as shown in FIG. 8. The lift truck 55 may then be driven into its unloading position and the bags may be unloaded from the body 231B in the manner hereinbefore described.

The present system as described with respect to FIGS. 5-8, may be utilized in those instances where the width of the vehicle body being loaded does not materially exceed the length of the hand trucks, but in those instances where the width of the transport body is too great, the system may employ a modification of the bag positioner 52 to handle balanced stacks of bags B. Thus, as shown in FIGS. 9 and 10 of the drawings, a positioner 352 is provided in the form of a special hand truck similar to hand truck 231 and having a wheeled base 352A and a removable or separable sideless body 352B mounted thereon. The body 352B has bottom and end walls and is guided for endwise movement on the base 352A by means including laterally projecting lugs or pins 365 that run under flanges 364 on the wheeled base 352A. Positioner or hand truck 352 includes, however, a motor-operated endless chain 352C which has a drive link 366 connected thereto and adapted for detachable connection with one end wall of the body 352B. Thus the positioner 352, after loading of the body 352B, may be brought into the position shown in FIG. 9, and by operation of the chain 352C, the body 352B may be pushed endwise from the dotted line position in FIG. 9 to the full line position there shown. In such a movement the body 352B may be moved into position on a platform 255P of the kind shown in FIG. 8 so that the unloading operation may be carried on as described in respect to FIG. 8. After the bags have been unloaded from the truck body 352B in the manner described with respect to the truck body 231B, the lift truck is brought back into position shown in FIG. 9, and the link 366 is connected thereto so that by operation of the chain 352C, the body 352B may be pulled back into the position shown in dotted outline in FIG. 9. The body 352B may then be reloaded and the operation repeated. Such loading of the sideless body 352B may be accomplished in the manner shown in FIG. 10 where a conventional hand truck 31 is brought into position beside the positioner 352 and a pusher truck 355 having a pusher plate 355P operated to push the balanced stack of bags B off of the hand truck 31 and into position on the positioner body 352B. In this respect, it may be noted

that if the positioner body 352B is of substantially greater length than the body of the hand truck 31, there will be some redistribution of the bags on the body 352B by reason of an endwise sliding or rolling of the bags of the balanced stack within the confines of the positioner body 352B.

In FIGS. 11-13, the loading portions of the present system are illustrated as accomplishing loading of balanced stacks of mags without separation of the body of the hand truck from its base. Thus, in FIG. 15, a hand truck 431 is illustrated which in most of its structure is identical with the usual hand truck. In this instance, however, a plurality of bars 431B are provided that extend transversely of the platform of the hand truck 431 in a laterally spaced relation. This leaves transverse spaces 431S between the adjacent bars 431B and these spaces are sufficient in height and width to receive fork members 455F with which the lift truck 455 is provided in this instance. Hence the lift truck 455 is manipulated to insert the forks 455F into the several spaces 431S, and the platform provided by the forks 455F is then elevated to lift the balanced stack out of the truck 431. The balanced stack is at this time supported or confined at its ends by a pair of end walls 455E that are associated with the lift forks 455F, and it will be noted by a comparison of FIGS. 11 and 13, that the end walls 455E are spaced apart in such an amount that they may move into position opposite or outside of the ends of the hand truck 431 as the forks 455F are being inserted beneath the load. In this respect it may be pointed out that the end walls 455E are supported from their rear edges so that after the forks 455F are in place beneath the load, the entire load may be lifted upwardly out of the hand truck 431, and thus the hand truck may be withdrawn in an endwise direction.

In FIG. 14 of the drawings still another arrangement is disclosed whereby balanced stacks of mail from a conventional hand truck may be handled as a group or as balanced stacks without the necessity for using a separable hand truck body. Thus in FIG. 14 the lift truck 555 is illustrated wherein a platform 555P is carried on supporting arms 555A, and this platform has end walls 555E. A hand truck 31 is moved into position opposite the forward side of the platform 555P, and a pusher truck 555M is positioned on the opposite side of the hand truck so that it may by operation of its positioner mechanism transfer the entire load or stack of bags from the hand truck 31 onto the platform 555P where the load will be located between the end walls 555E. The lift truck 555 may then be manipulated to put the balanced stack of bags in position on the transport body in the manner hereinbefore described.

Adjustable width platform and pusher for the lift truck 55

In some instances the doors in a freight car or the like are of a width that is substantially less than the width of the car body, and in such an instance it would be difficult to move the lift truck 55 into position within the car body 51. For use in such an instance, the lift platform and pusher plate structures of the lift truck 55 may be constructed for adjustment as illustrated in FIGS. 15-17 of the drawings. Thus a lift platform 955P is provided that is hollow in character so as to provide end opening slots in which extensions 955E are slidably mounted. Similarly, a pusher plate 955B is provided that is hollow and has their opening slots in which extensions 1055B are provided. These extensions of the pusher plate and the platform may be pushed inwardly into position within the hollow supporting structure while the lift truck 55 is being moved into and out of the car body 51, and these elements may then be extended to the width required for handling the tier of bags that is the full car width.

Conclusion

From the foregoing description it will be apparent that the present invention provides an improved system for

handling, sorting and loading bagged mail, whereby the labor costs and time required are materially reduced and the danger of the workers incurring back injuries or the like is particularly eliminated. It will be evident that the present invention provides such a system where walking, stooping and lifting are minimized, and the character of the work involved is made more desirable.

It will also be apparent that the present invention provides a mail handling system wherein the bags are oriented early in the cycle of operations, and wherein this originally established orientation is preserved throughout all of the subsequent handling operations so that the physical effort and time that has heretofore been required in repeated reorientation of the bags is eliminated.

It will also be apparent that the present invention provides a system wherein any handling operations with respect to the bags require merely turning or support of the bags and do not involve actual lifting of the bags, and it will also be apparent that under the present invention, the system of handling mail bags is of such a character that maximum use may be made of power lifting and transporting machines.

Thus while I have illustrated and described preferred examples and embodiments of my invention it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appending claim.

I claim:

In a system for handling loaded mail bags and loading same in tier fashion into a transport vehicle, a lift truck for handling the bags in tier fashion inside the vehicle, said lift truck comprising:

a wheeled mobile body,

a vertically movable load support platform extending laterally of said body and proportioned to support a load of one or more tiers of mail bags positioned in substantially parallel side-by-side relation with said bags extending parallel to the forward and rearward direction of movement of said truck,

said platform at the ends thereof defining the lateral load carrying boundaries of the truck whereby said platform defines the effective load carrying width of said truck,

said platform including means for increasing the effective load carrying width of said truck,

said means including extension members at each of said platform ends and carried by said platform in substantial coplanar relation with said platform,

and means for mounting each of said extension members for movement between a retracted position wherein said members are disposed within said lateral load carrying boundaries, and an extended position in which said members extend beyond the respective ends of said platform to increase said load carrying boundaries,

said lift truck further including substantially vertically disposed pusher plate means for engaging said tier load as a unit and pushing same off said platform in a direction longitudinally of said truck,

said pusher plate means including a pusher plate member extending laterally of said body and having its ends disposed in substantial alignment laterally of said truck with said load carrying boundaries, and means for moving said pusher plate member across said platform,

said pusher plate member including means for increasing the length thereof laterally of said truck beyond said boundaries and comprising extension members at each of said pusher plate member ends and carried by said pusher plate member in substantial coplanar relation with said pusher plate member,

and means for mounting each of said pusher plate member extension members for movement between a retracted position wherein said members are disposed within said lateral load carrying boundaries

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and an extended position in which said members extend beyond the respective ends of said pusher plate member to extend said boundaries.

References Cited by the Examiner

UNITED STATES PATENTS

1,506,657	8/1924	Nordstrom et al.	214—11
1,637,420	8/1927	Klein	214—6
2,394,692	2/1946	Isler	214—152
2,396,090	3/1946	Curtis.	
2,496,039	1/1950	Crawford	214—514

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2,549,202	4/1951	Idelman	214—6 X
2,605,910	8/1952	Kovatch	214—6
2,742,167	4/1956	Brudi	214—514
2,813,638	11/1957	Miller.	
2,843,278	7/1958	Qveflander	214—152
2,918,186	12/1959	Cirillo	214—514 X
2,959,313	11/1960	Bettencourt et al.	214—731

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