J. KEERS.

PACKAGE ELEVATOR.

APPLICATION FILED JULY 28, 1910.

1,037,635.

Patented Sept. 3, 1912.

3 SHEETS—SHEET 1.

Fig. 1

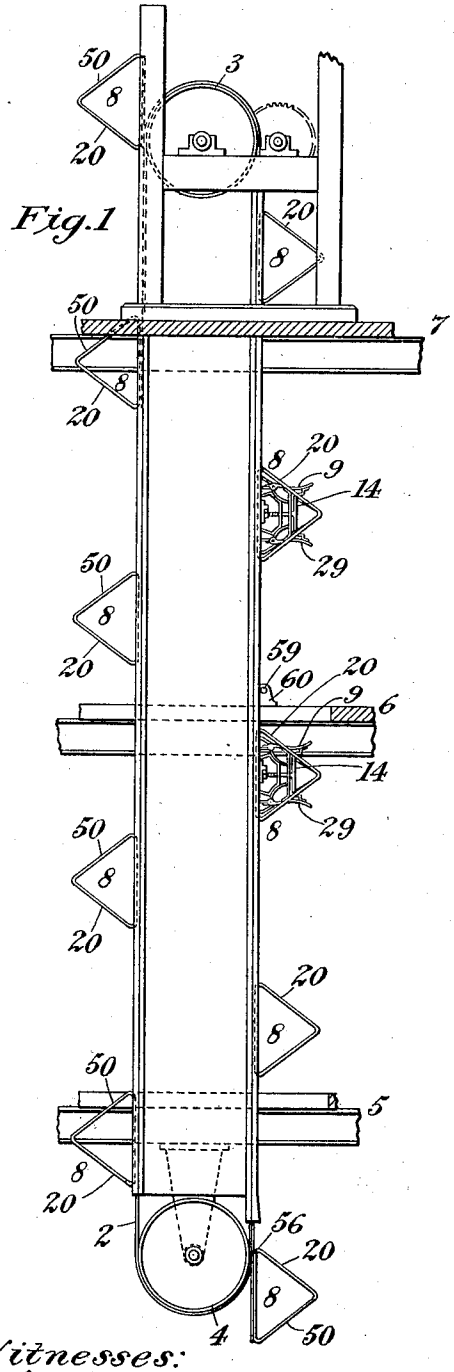
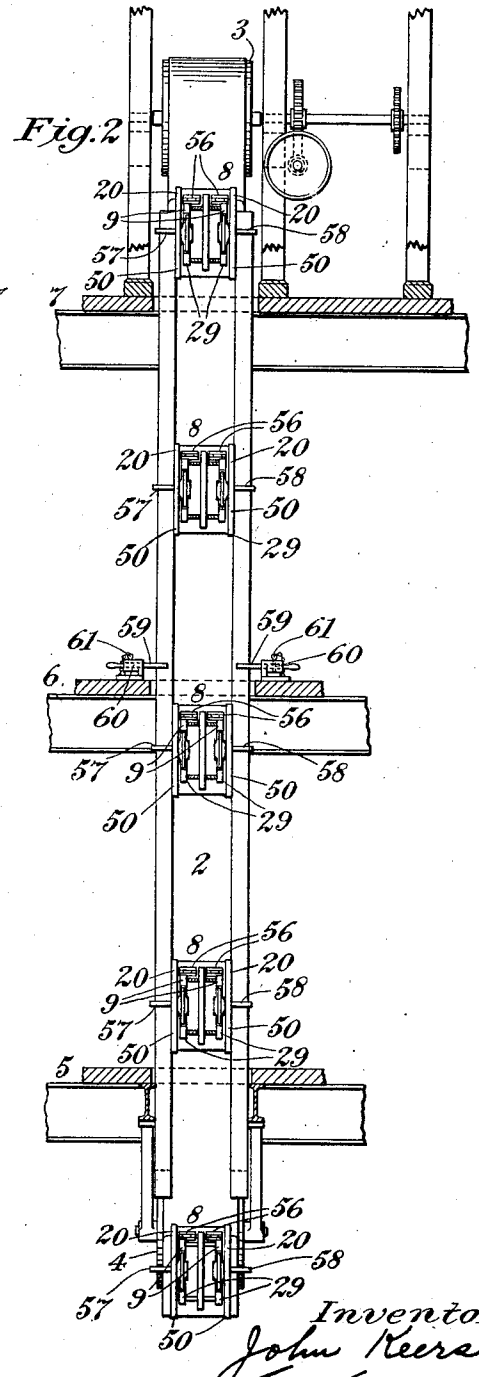


Fig. 2



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3 SHEETS—SHEET 2.

Fig. 4

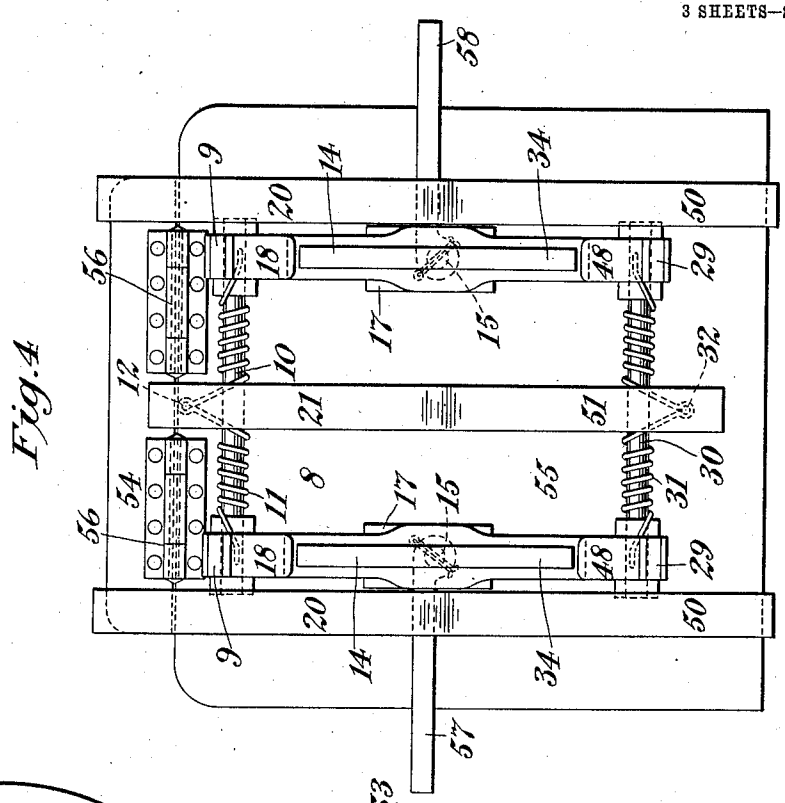
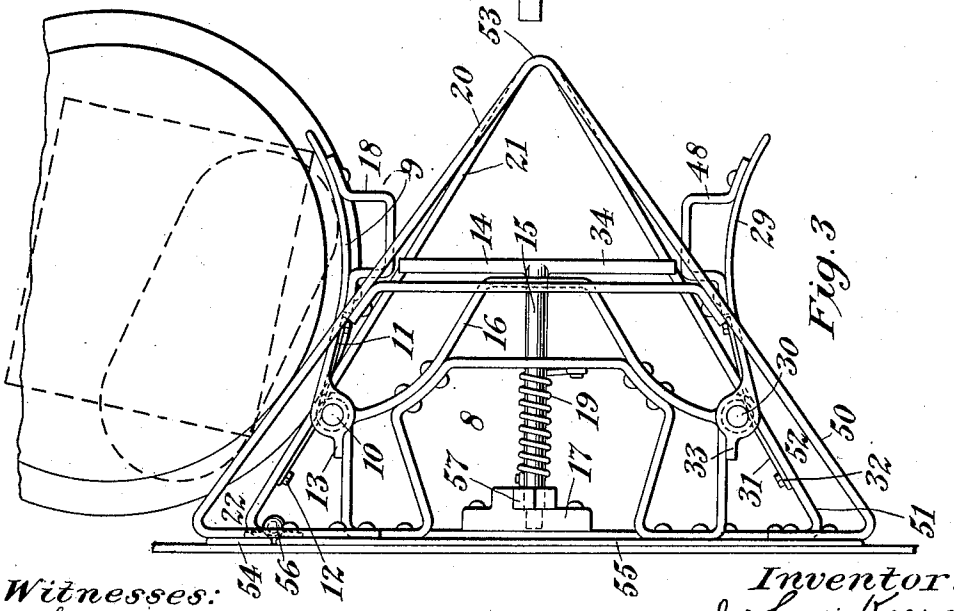


Fig. 3



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3 SHEETS—SHEET 3.

Fig. 6

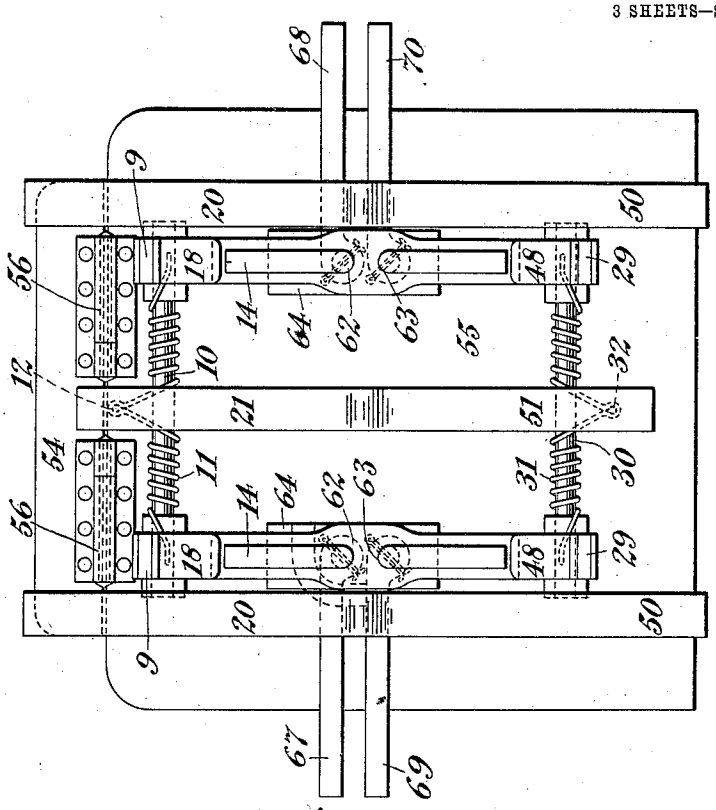
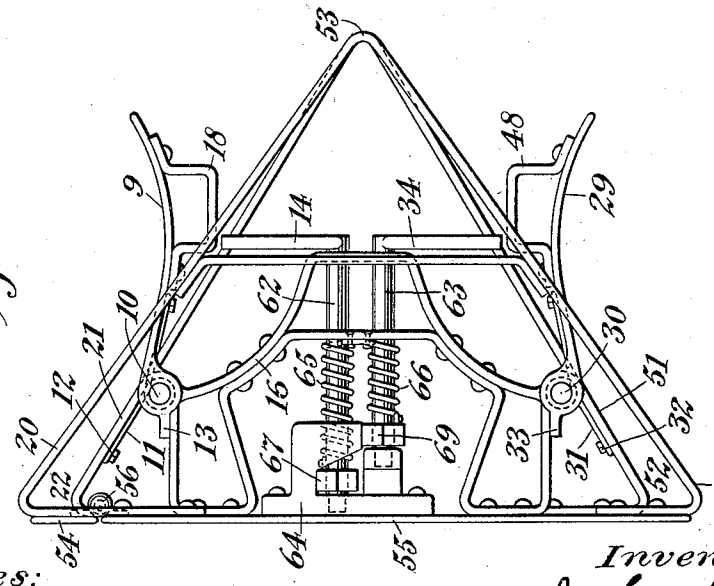


Fig. 5



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PACKAGE-ELEVATOR.

1,037,635. Specification of Letters Patent. Patented Sept. 3, 1912.

Application filed July 28, 1910. Serial No. 574,251.

To all whom it may concern:

Be it known that I, JOHN KEERS, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Package-Elevators, of which the following is a specification.

This invention relates to a package elevator, and the main object of the invention is to produce an elevator of this type capable of conveying packages of different kinds or sizes, or both—such for example as barrels, boxes and bags—from one floor to another of a building, and especially to produce a package-elevator capable of conveying either loaded or unloaded packages, or both, either up or down, or both up and down, and to deliver such packages substantially automatically at whatever floor of the building they may be required.

The package elevator herein illustrated shows different ways in which the invention may be carried out for conveying various kinds and sizes of packages, and particularly for raising and lowering, or both raising and lowering, barrels, boxes and bags containing sugar, coffee and other commodities.

One of the principal features of the invention is the provision in an elevator of this type of a package-holder preferably so constructed as to be capable of retaining in position any of the different kinds of packages just mentioned, which package-holder is movable from a package-retaining position in which it permits the package to be carried up or down by the elevator as desired, to a package-releasing position in which it is ineffective to retain the package in position to be conveyed by the elevator. Suitable means are provided for maintaining or supporting this movable package-holder in its package-retaining position, and tripping means is provided for releasing the movable package-holder at any desired point in the path of travel of the conveyer to which it is secured in order that the package may be released at the desired floor of the building.

A further important feature of the invention is that such movable package-holders are preferably provided both for raising and for lowering packages, the construction being to advantage duplex with the up and down package-holders oppositely disposed so that the former will be effected during its upward movement and the latter will be effected during its downward movement. Other suitable up and down devices corresponding to these up and down movable package-holders will be hereinafter more fully described and claimed.

A further feature of the invention is the provision in connection with the movable package-holders before described of fixed package-holders coöperative with the movable package-holders, when the latter are in operative position, for retaining the packages in place until it is desired to release them at a given floor or floors. These fixed package-holders are preferably inclined and constitute traveling skids, while the movable package-holders constitute retaining devices for holding the barrels, boxes, bags, etc., on these traveling skids, the construction of the skids being preferably such that the packages will slide down them at the desired points or floors whenever the movable package-holders or retaining devices are released. When suitable tripping means is employed in connection with such coöperative fixed and movable package-holders it is obvious that on the tripping of the movable package-holder the package that is released will slide down the incline of its skid and be delivered substantially automatically by the action of the package elevator and its tripping means. Heretofore it has been customary to place a heavy skid in position at the desired floor where it would be struck by a descending barrel, and as the support for the barrel continued down with its conveyer the barrel would slide down the skid onto the desired floor. It is not possible, however, to do this in the case of barrels being raised.

As before stated, the present invention is designed to provide a package-elevator capable of discharging both ascending and descending barrels—and also packages of other kinds—whether loaded or unloaded, in a substantially automatic manner. Different types of means which may be employed for accomplishing this result, and various details thereof not hereinbefore spe-

cifically referred to will be hereinafter described and claimed and are illustrated in the accompanying drawings, in which—

Figure 1 is a sectional end elevation illustrating semidiagrammatically one embodiment of my present invention; Fig. 2 is a sectional front elevation of the same; Fig. 3 is an enlarged side elevation of one of the package-carriers of said package-elevator and illustrates packages of different kinds in operative position thereon; Fig. 4 is a front elevation of the package-carrier shown in Fig. 3, and Figs. 5 and 6 are respectively a side and front elevation, corresponding to Figs. 3 and 4, of a modification of the invention hereinafter described.

Referring first to Figs. 1 to 4 inclusive, I have illustrated as one of the main elements of the package-elevator there shown a conveyer which is preferably of the endless type and is designated by 2. This endless conveyer may be supported on and travel around the usual drums or sheaves 3 and 4 and may be operated by any suitable or usual mechanism, a portion of which is indicated in Figs. 1 and 2. This conveyer moves in a circuit in a suitable elevator shaft passing through the different floors of the building, different floor levels being shown at 5, 6 and 7. To the conveyer 2 just described are attached package-carriers so constructed, as hereinbefore indicated, as to be capable of delivering packages traveling either up or down substantially automatically. The elevator preferably has a circuit of these carriers properly spaced, usually at equal distances apart, as indicated in Figs. 1 and 2, and the construction of one of these package-carriers is illustrated on an enlarged scale in Figs. 3 and 4. Each package-carrier is designated generally by 8. It is secured to the conveyer 2 and intended to travel with it in a circuit around the drums 3 and 4. All of the package-carriers secured to the conveyer 2 will usually be identical in construction, and the description of one will suffice for all. Each embodies as its main element a package-holder movable from a package-retaining to a package-releasing position. This movable package-holder is preferably a pivoted one and its axis is preferably horizontal. Moreover the pivot point of this package-holder on the package-carrier 8 is located nearer the conveyer 2 than the free end of the package-holder, so that the package-holder faces outward and when released drops out of the way to permit discharge of the package theretofore held in place by it. Such a movable package-holder is indicated at 9 and its axis is in the shaft 10. As shown it is concaved and normally has such a position as to constitute a support substantially fitting a barrel (which is the principal package intended to be conveyed) and also adapted to support packages of other kinds and shapes, such as boxes and bags, which are indicated by dotted lines in Fig. 3. This movable package-holder when the package-carrier is not loaded is preferably held in its package-retaining position by a suitable actuator, such for example as spring 11. In the construction shown this spring is fastened at a fixed point 12 to a fixed part of the package-carrier and is also fastened to the pivoted package-holder. In this case there are illustrated in Figs. 3 and 4 two movable package-holding elements 9, and the spring 11 is shown as embodying two sets of coils connected at their outer ends respectively with the two elements 9. The spring 11 illustrated is a coiled spring and is wound around the shaft 10 which is mounted in bearings at opposite sides of the package-carrier, the movable holders 9 being movable in unison about the axis of this shaft and having tail-pieces, such as 13, for engaging suitable stops on the package-carriers, these stops being in this case parts of the main or fixed portion of the package-carrier. When the package-holder 9 is in its package-retaining position and the package-carrier is loaded other means than the spring 11 must be employed for maintaining said package-holder in that position. For this purpose I prefer to use package-holder supporting means adapted to support the load of a full barrel, box or bag, as the case may be, this supporting means preferably embodying one or more package-holder supports movable into position under corresponding package-holder or holders 9 for the purpose of sustaining the weight borne thereby. In this case the package-holder supporting means embodies a pivoted package-holder support, such as 14, the axis of which is in a rock-shaft 15 mounted in suitable bearings, one of which is illustrated as in a frame member 16 of the package-carrier and the other of which is illustrated as in a bearing-block 17 fastened to the back of the package-carrier, that is, to the part of the package-carrier adjacent the conveyer 2. The movable package-holders shown in these views are shown as having extensions or projections 18 adapted to rest on the upper ends of the package-holder-supporting rock-arms 14 when said rock-arms are in their operative positions. It will be seen that the axis of each of these rock-arms is substantially in vertical alinement with the center of the corresponding package-holder support 9.

In addition to providing means for normally maintaining the movable package-holder in its package-retaining position it is desirable to provide means for normally maintaining the package-holder supporting means in its operative position, whether there is a package on the carrier or not. Ac-

tuating means similar to that just described in connection with the package-holder 9 may be employed for this purpose. A coiled spring is shown at 19 as wound around the rock-shaft 15 and secured at one end to the frame member 16 and at its other end to said rock-shaft. By means of this spring the rock-arm and its supporting shaft are normally maintained in position for the upper end of the rock-arm to sustain the weight of any load placed on the package-holder 9. Two package-holder supports of the construction just described are illustrated in Fig. 4 as mounted between the sides of the main fixed portion of the package-carrier, and the parts thereof are indicated by the same reference characters. One of these supports coöperates with the package-holder 9 at one side of the carrier and the other with the holder 9 at the opposite side.

An important feature of the package-carrier is the provision in connection with the movable package-holder of a fixed package-holder coöperative therewith. Such a fixed package-holder constitutes in the construction illustrated in these views one of the main parts or elements of the fixed package-carrier or package-carrier proper, and in fact serves in said construction as a support for the package. This fixed package-carrier is preferably so constructed that in its normal position, that is, when traveling vertically up and down, it is inclined downward at such an angle to the horizontal as to form a traveling skid down the incline of which the package will slide or roll when the movable package-holder is released from its package-supporting means. It is also preferably so constructed as to be lower at its center than at its sides at points near its upper end, its central portion being illustrated as inclined to the horizontal at a less angle than its sides to form a concaved or dished support adapted to fit barrels and support them both at the ends and at the bulge. Such a fixed package-holder is shown clearly in Figs. 3 and 4, it being there illustrated as of skeleton construction having two like side members designated by 20 and a central member 21 disposed at a more acute angle to the horizontal. The fixed package-holder is designated as a whole by 22. It will be seen that the axis of the movable package-holder 9 is located within, that is below, the fixed package-holder and that the movable package-holder projects beyond and above the inclined surface of the fixed package-holder when in its normal or package-retaining position. When released, however, the movable holder 9 drops down to a position where it lies wholly below or within the inclined surface of the fixed package-holder.

The parts just described, when suitably supported, constitute all that are necessary for retaining a package—whether in barrel, box or bag form—in position and conveying it in one direction, that is, vertically either up or down. When it is desired, however, to convey such packages in both directions vertically, that is both up and down by an endless conveyer, it is necessary to provide additional means for that purpose.

In the preferred construction the parts just described will be practically duplicated but oppositely disposed, in order that one set of parts may come into action when a package is to be elevated and the other set of parts come into action when a package is to be lowered. Thus the two different sets of devices or parts are not intended to be used at the same time, but one set will be used for elevating and the other set for lowering packages. Thus the two sets of devices and their different elements may be designated as up and down devices or elements, and if the parts just described be assumed to be those for raising packages, then the parts now to be described will be those for lowering packages, that is to say, they will be the down set as distinguished from the up set or elements just described. Preferably, as before mentioned, the down set or devices will be substantially identical with the corresponding up elements. As shown in Figs. 3 and 4 they comprise a movable down package-holder 29 movable about a horizontal axis in a rock-shaft 30, which axis is parallel with that of the corresponding up element 9; a spring 31 for normally maintaining the movable down package-holder 29 in its package-retaining position, said spring being fastened at a fixed point 32 to the package-carrier; a tail-piece 33 for limiting the movement of the movable package-holder 29 by the spring 31, this tail-piece coöperating with a stop face on the fixed frame member 16; down package-holder supporting means comprising as one element thereof a rock-arm 34 corresponding to the rock-arm 14, and as another element thereof the rock-shaft 15, which it will be seen is common to both the up and down rock-arms 14 and 34; actuating means for normally holding the down package-holder support 34 in its normal position, which means is the spring 19 constituting a common actuator for both the up and down package-holder supports; an extension or projection 48 corresponding to that at 18 and adapted to engage and be supported by the free end of the rock-arm 34 when the down devices of the elevator come into action, and a down fixed package-holder substantially identical with the up fixed package-holder before described except that it is oppositely disposed, the side elements thereof being designated by 50, the central element by 51 and the fixed package-holder as a whole by 52. The elements 20,

21, 50 and 51 of the up and down fixed package-holders 22 and 52 form in this case with the back or base portion of the package-carrier 8 a substantially triangular member the up and down sides of which preferably make substantially equal angles with the base of the triangle and are oppositely inclined toward the horizontal and converge and meet at the point 53. The up and down fixed package-holders are preferably, as described, of skeleton construction, and the inner or back portions thereof are bent over in this case and securely riveted to conveyer-engaging members, such as back plates 54 and 55, which are joined by a hinged connection indicated at 56. One leaf of this hinged connection is fastened to the plate 54 and the other to the plate 55. All of the parts of the carrier are firmly secured to these two plates and the plates themselves are secured to the conveyer or belt 2, each preferably along a single transverse line, as by a single row of rivets, in order that the conveyer-belt may go over and under the drums or sheaves 3 and 4 without being injured or cut, as it would be if the plates 54 and 55 were made in one piece without the hinged connection just described. The parts at the bottom of the carrier, as seen in Figs. 3 and 4, are duplicated at opposite sides thereof in the same manner as are the corresponding devices at the upper side of said carrier.

In connection with the fixed and movable package-holders before described suitable means will be employed for releasing the movable package-holder and permitting a package to slide down the incline of the traveling skid or fixed holder. This may be accomplished by the employment of any suitable tripping means embodying an element traveling with the package-carrier and a coöperative element localized at the floor at which it is desired to deliver a package. Such tripping means may be so constructed as to be operative either an up movement or a down movement of an elevator embodying my improved package-carrier, or it may be and preferably is so constructed as to be operative on both the up and down runs of an endless conveyer or elevator embodying package-carriers of this type.

In Figs 3 and 4 the traveling tripping means is shown as common to both the up and down movable package-holders, or rather to both the up and down package-holder supports, the traveling tripping means shown being in these views a pair of oppositely-extending rock-arms 57 and 58 secured to the two rock-shafts 15, as by means of cotter-pins. When these arms 57 and 58 are properly struck either on the up or on the down movement of the package-carrier by suitable localized tripping means they will be turned and with them the rock-arms 14 and 34 will turn and withdraw from engagement with the movable package-holders 9 and 29. If either one of these is loaded at the time the weight of the load will oscillate it downward to the position before described and the package will slide or roll down the incline of the corresponding fixed package-holder onto the floor at which the device was tripped. The unloaded movable package-holder will of course be maintained in its normal position by its spring.

The localized tripping means coöperative with the arms 57 and 58 may be of any suitable type, such for example as the bars or pins 59 shown particularly in Fig. 2. These are preferably movable into and out of the path of travel of the rock-arms 57 and 58 according as it is or is not desired to release a package at the floor at which the trip-pins 59 are located. Of course these localized trips will ordinarily be placed at each floor and used as required. When in use they may be supported in strong bearing-blocks, such as 60, and suitably held in place therein, as by pins 61. Similar localized trips or tripping means may also be used at the opposite run of the elevator, in order that the packages, of whatever type they may be, and whether they are full or empty, may be delivered at the different floors as required and substantially automatically.

In Figs. 5 and 6 I have illustrated a modification of the invention which may also be used if desired and which is another of various forms worked out by me and illustrating a different stage of development of the invention. In these views most of the parts are identical with those illustrated in Figs. 3 and 4 and they are designated by corresponding reference characters. In this modification, however, the up and down devices are entirely distinct from each other and have no common parts. Thus separate rock-shafts are shown at 62 and 63 for supporting the up and down rock-arms or package-holder supports 14 and 34, and these rock-shafts mounted in separate bearings both in the frame member 16 and in the bearing-block 64 corresponding to that shown at 17. Again, separate actuators or springs 65 and 66 are shown for turning the package-holder supports 14 and 34 entirely independently of each other. In addition to this the up and down movable package-holders and their supports have separate traveling trips, the trips of the up side being indicated at 67 and 68 and those of the down side at 69 and 70. In other respects the construction is substantially the same as that before described and the mode of operation is also practically identical, except of course that the releasing func-

tions for the up and down devices are separate.

What I claim is:

1. A package elevator, embodying a package-carrier having fixed and movable package supporting and discharging holders the former of which is inclined downward toward the horizontal and the latter of which is supported on the former and mounted to drop from its normal package-retaining position to a package-releasing position, and means separate from said movable package-holder and releasable therefrom but normally in engagement therewith for supporting the movable package-holder.

2. A package elevator, embodying a package-carrier having fixed and movable package supporting and discharging holders the former of which is inclined downward toward the horizontal and the latter of which is supported on the former and mounted to drop from its normal package-retaining position in which it projects above said incline to a package-releasing position in which it lies wholly below said incline, and means separate from said movable package-holder and releasable therefrom but normally in engagement therewith for supporting the movable package-holder.

3. A package elevator, embodying a package-carrier having as its only relatively movable support for a package package-holding means mounted to drop from its normal package-retaining position to a package-releasing position, an actuator for normally shifting said package-holding means to its package-retaining position, and means separate from said package-holding means and releasable therefrom but normally in engagement therewith for supporting the same.

4. A package elevator, embodying a package-carrier having fixed and movable package-supporting holders the former of which is inclined downward toward the horizontal and has a greater slope at its sides than at its center and the latter of which is supported on the former and mounted to drop from its normal package-retaining position to a package-releasing position, and means separate from said movable package holder and releasable therefrom but normally in engagement therewith for supporting the movable package-holder.

5. An endless package elevator, embodying a package-carrier movable in a circuit and having up and down fixed package-holders and up and down movable package-holders each mounted on and coöperative with a corresponding up or down fixed package-holder to retain the package in position and each adapted to drop from its normal package-retaining position to a package-releasing position, and each fixed package-holder being in contact with, and extending under a considerable portion of, the down side of a package positioned by it, and means separate from said movable package-holders and releasable therefrom but normally in engagement therewith for supporting them in their operative positions.

6. An endless package elevator, embodying a package-carrier movable in a circuit and having up and down fixed package-holders the supporting surfaces of which converge and are inclined oppositely to the horizontal and also having up and down movable package-holders each mounted on and coöperative with a corresponding up or down fixed package-holder to retain the package in position and each adapted to drop from its normal package-retaining position to a package-releasing position, and means separate from said movable package-holders and releasable therefrom but normally in engagement therewith for supporting them when in their operative positions.

7. An endless package elevator, embodying a package-carrier movable in a circuit and having up and down fixed package-holders and up and down movable package-holders each pivoted on and coöperative with a corresponding fixed package-holder and each adapted to drop at its free end from its normal package-retaining position to a package-releasing position, and each fixed package-holder being in contact with, and extending under a considerable portion of, the down side of a package positioned by it, and means separate from said movable package-holders and releasable therefrom but normally in engagement therewith for supporting each movable package-holder at a point between its axis and its free end when said package-holder is in its operative position.

8. An endless package elevator, embodying a package-carrier movable in a circuit and having up and down fixed package-holders and up and down movable package-holders the fixed package-holders having supporting surfaces inclined oppositely to the horizontal and converging throughout their lengths and each of the movable package-holders being pivoted on and coöperative with a corresponding fixed package-holder and each adapted to drop at its free end from its normal package-retaining position to a package-releasing position, and means separate from said movable package-holders and releasable therefrom but normally in engagement therewith for supporting them when in their operative positions.

9. An endless package elevator, embodying a package-carrier movable in a circuit and having up and down fixed package-holders and up and down movable package-holders each pivoted on and coöperative with a corresponding fixed package-holder and each adapted to drop at its free end from its nor-

mal package-retaining position to a package-releasing position, means separate from said movable package-holders and releasable therefrom but normally in engagement therewith for supporting each movable package-holder at a point between its axis and its free end when said package-holder is in its operative position, and actuating means for normally shifting each of said package-holders to its package-retaining position.

10. An endless package elevator embodying a package carrier movable in a circuit and having up and down package-holders each mounted to drop from a package-retaining to a package-releasing position, and a package-holder support having a supporting arm common to both of said package-holders and movable into and out of action.

11. An endless package elevator, embodying a package carrier movable in a circuit and having up and down package-holders each movable from a package-retaining to a package-releasing position, and up and down package-holder supports each embodying a package-supporting rock-arm movable from an operative to an inoperative position, said supports also embodying a common rock-shaft for said rock-arms.

12. An endless package elevator, embodying a package carrier movable in a circuit and having up and down package-holders each movable from a package-retaining to a package-releasing position, up and down package-holder supports each embodying a package-supporting rock-arm movable from an operative to an inoperative position, said supports also embodying a common rock-shaft for said rock-arms, and a spring for normally turning said rock-shaft and rock-arms to their operative position.

13. An endless package elevator embodying an endless conveyer, and a substantially triangular package carrier secured at its base to said conveyer and the other sides of which converge and are inclined oppositely to the horizontal and constitute fixed up and down package-holders and embodying movable up and down package-holders each of which is mounted to drop when in use from a package-retaining to a package-releasing position.

14. An endless package elevator embodying an endless conveyer, and a substantially triangular package carrier secured at its base to said conveyer and the other sides of which converge and are inclined oppositely to the horizontal and constitute fixed up and down package-holders and make substantially equal angles with said base, said carrier also embodying movable up and down package-holders each of which is mounted to drop when in use from a package-retaining to a package-releasing position.

Signed at New York, in the county of New York and State of New York, this 27th day of July, A. D. 1910.

JOHN KEERS.

Witnesses:
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R. CHAMPION.