(No Model.) 2 Sheets—Sheet 1.

G. W. BROWN.

ENDLESS PACKAGE ELEVATOR.

No. 265,238. Patented Oct. 3, 1882.

Fig. 1.

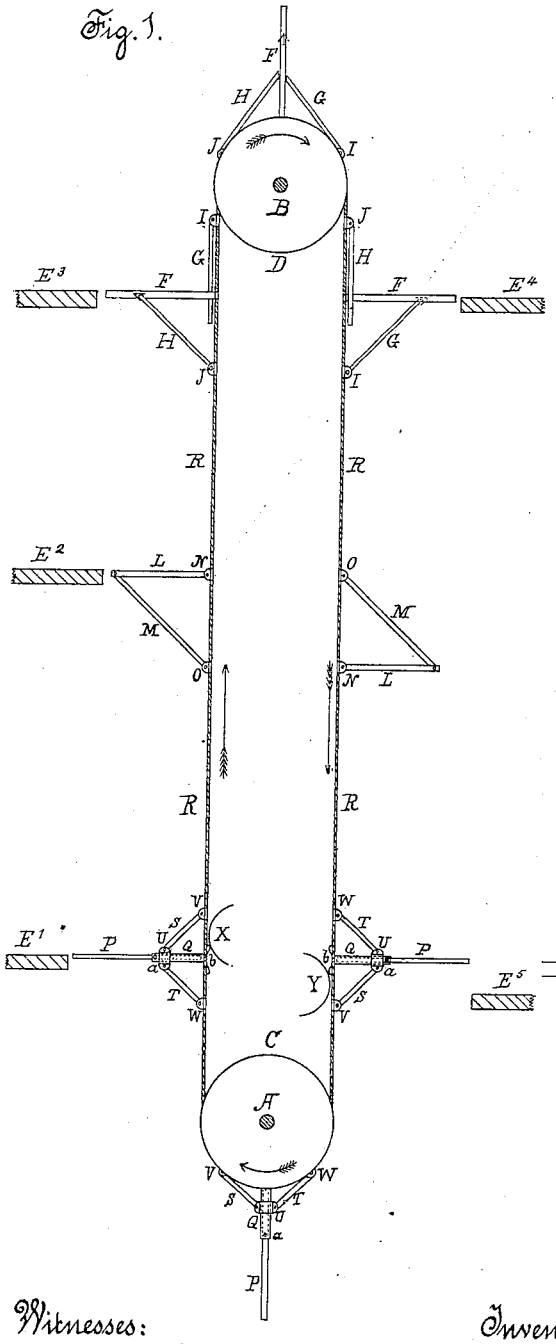
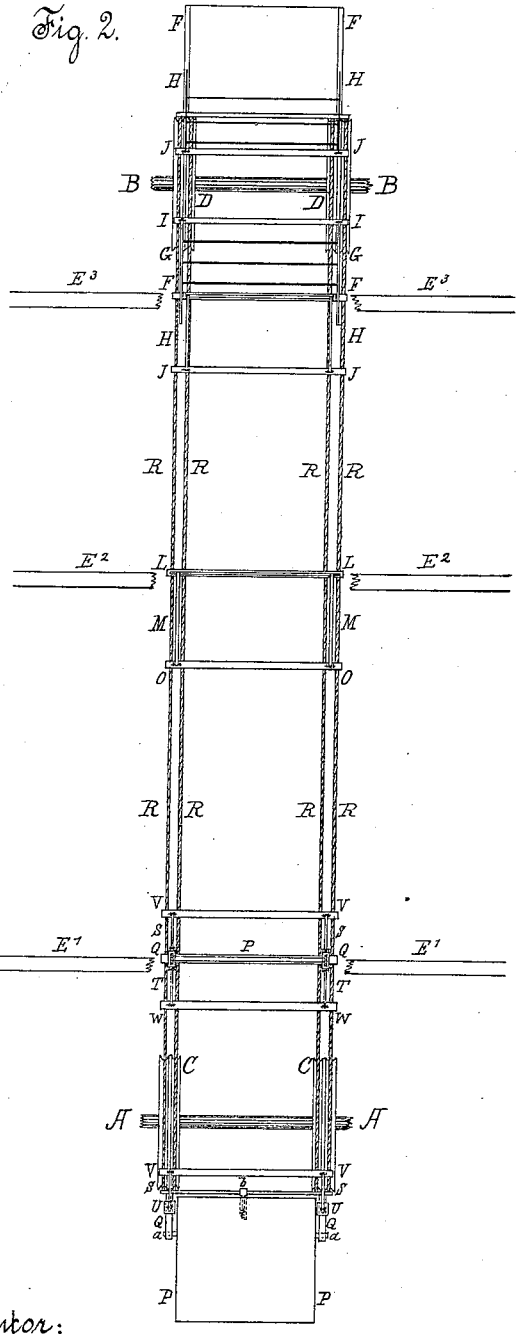


Fig. 2.



Witnesses:

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Jacob Rettig

Inventor:

Geo. W. Brown

(No Model.) 2 Sheets—Sheet 2.

G. W. BROWN.

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Fig. 3.

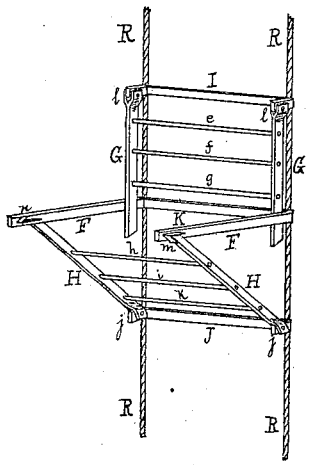


Fig. 4.

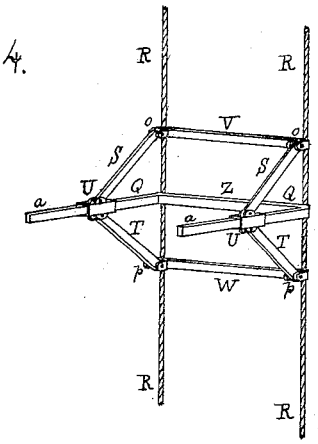


Fig. 5.

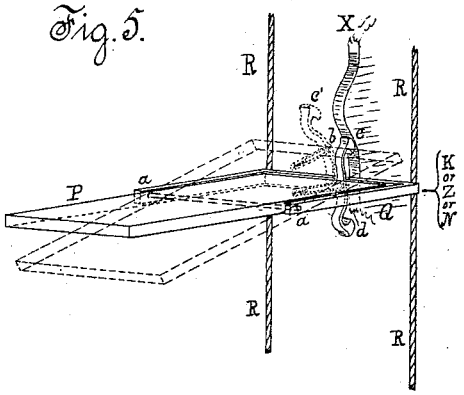


Fig. 6.

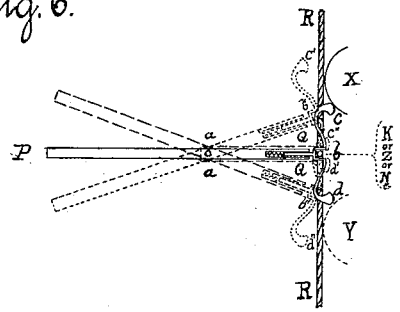
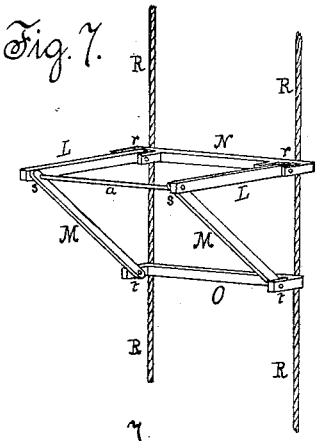


Fig. 7.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE W. BROWN, OF NEW YORK, N. Y.

ENDLESS PACKAGE-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 265,238, dated October 3, 1882.

Application filed February 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BROWN, of the city of New York, in the county and State of New York, have invented a certain new and useful Endless Package-Elevator, of which the following is a specification, reference being had to the accompanying drawings, constituting a part thereof.

The chief objects of my invention are to provide an endless elevator for packages, bales, barrels, &c., which shall be capable of raising and lowering loads continuously and simultaneously on opposite sides of the traveling belt, or parallel ropes or chains as its equivalent, composing the elevator, wherefrom results economy of time, labor, and power, and to provide thereupon platforms equally serviceable for carrying loads during ascent or descent, or both, and, further, adapted to be self-unloading during ascent or descent, or both, through the gravitation, when unrestrained, of the load itself, thus utilizing a force hitherto wasted and economizing power otherwise necessary to tilt the platform to discharge the load; and also to provide mechanism, preferably operating on the principle of the cam, and located at desirable points, whereby such unloading may be performed by the elevator itself, and to provide for such carrying-platforms a suitable supporting-frame so jointed or hinged together, and to the endless traveling belt or equivalent, as to be flexible enough to turn the pulleys upon and around which the endless belt travels, and yet rigid enough to afford a firm support to the platform and its load during ascent or descent, and to provide an endless traveling belt to bear a series of such carrying-platforms and their frames which shall be light, strong, and cheap, and yet have sufficient tractive power.

To these ends I have invented and adapted the means and mechanical devices shown in their construction and operation in several views by the accompanying drawings, wherein similar letters of reference designate corresponding parts throughout the views.

Figure 1 is a side elevation, and Fig. 2 is a front elevation, of an endless package-elevator constructed and operated in accordance with my invention, the arrows pointing the direction of supposed revolution. Figs. 3, 4, and 7 are enlarged perspective views of my supporting-frames for the carrying-platforms. Fig. 5 is a detailed perspective view of the construction and operation of my self-unloading carrying-platform and its automatic action, and Fig. 6 is a detailed sectional view of the same on the median line of length.

A and B are shafts bearing in suitable pillow-blocks or hangers upon the lower and upper floors, respectively, of the warehouse or other structure wherein it is designed to erect one of these elevators. These shafts bear grooved pulleys C C and D D, upon and around which travel the endless belt, chains, or ropes R R composing the elevator. Motion is communicated through teeth or friction in the well-known ways by power applied to either shaft. It is obvious that the frames which support these shafts may be made portable, so that the elevating apparatus may be taken down, transported, and erected in another locality, if desired. This endless belt, as I prefer to use it, is composed of companion wire ropes, R R, to which the platform frames and braces are attached by clips, and depends upon traction for its ability. So to increase tractive power I employ companion pairs or series of wire ropes, R R and R R, as shown in Fig. 2, whereby traction may be increased as desired. The pulleys C C and D D are correspondingly grooved, and the grooves may be V or U shaped, as preferred, or may be rubber lined. Steel bands may be substituted for these ropes and used in the same manner; or teeth may be provided upon the pulleys to engage between the companion pairs or series of bands against the bars or rounds connecting the companion bands and holding them parallel. Such construction reduces the cost of the elevator, besides rendering it lighter and stronger and easily operated with less power. To this endless belt (and I here and hereinafter in this specification use the term "endless belt" as a brief and generic term, including parallel endless ropes or chains or bands, however connected and of whatever materials as equivalents or species) are affixed a series of carrying-platforms, as shown most clearly in Fig. 1, which are borne by the belt during revolution. It is usual to construct the hoistway in the lowest floor somewhat narrower than the length of the

packages, bales, or bands intended to be elevated, and yet sufficiently wide to permit the passage of the platform, so that when the load is placed or rolled over it the ends will rest upon the opposite sides of the hoistway. The elevator-platform as it ascends through this hoistway takes up the load and carries it through larger hoistways in the upper floors to the destined floor, where it is removed by hand or dumped automatically; or skids may be used similarly placed with relation to the ascending carrying-platform. It is obvious that a load may be lowered from an upper floor and deposited on the bottom or an intermediate floor in a similar manner. When round packages or barrels are carried inclined skids may be adapted to load or unload the carrying-platforms after the well-known manner of using skids.

To support the carrying-platforms, I provide a frame-work of metal or wood, or both combined, according to the judgment of the mechanic. The simplest frame is shown in Fig. 7 and the middle portions of Figs. 1 and 2. It consists of companion arms L L, hinge-jointed to the bar or round N, propped in position by a pair of braces, M M, hinged to the arms at *s s* and to the bar or round O at *t t*. Such construction renders the frame sufficiently flexible to turn the pulleys D D and C C, and yet rigid enough to bear a load during ascent or descent. The bars or rounds N and O are affixed here to the ropes R R by clips; but any other preferred method of attachment may be adopted. Upon the rod *a* the platform may be pivoted, or the companion arms L L may form the sides of a solid platform, occupying the space between them. In this event the platform would be most serviceable during ascent, because then the braces would not interfere with or limit the size of the package carried as they would in descent, as shown most clearly in the middle portion of Fig. 1.

To provide a platform-frame properly braced to secure sufficient rigidity and lightness, and yet equally serviceable during ascent or descent, I have invented those shown in detail in Figs. 3 and 4 and in the upper and lower portions of Figs. 1 and 2. The simpler is that shown in Fig. 4 and the lower portion of Figs. 1 and 2. It consists of companion arms Q Q, to support the platform, which may be pivoted thereto at *a a*, or may be fixed therein, openings being allowed for the movements of the sliding boxes U U. These companion arms are rigidly affixed, as by clips, to the traveling belt or the ropes R R. Each arm has an upper and a lower brace, S and T, hinge-jointed at each end, respectively, to the sliding box U and to the traveling belt or the rope R. Bars V, Z, and W may connect the joints and ropes to secure greater rigidity. The operation of this device and its flexibility in rounding the pulleys are shown most clearly in the lower portions of Figs. 1 and 2. This frame-work is most suitable for round loads, like barrels, as the shape of such loads obviates any interference by the short braces with the serviceableness of the platform.

To provide a platform frame-work which shall be rigid in bearing loads, yet flexible in revolution and perfectly clear on top both during ascent and during descent, I have invented that shown in detailed perspective in Fig. 3 and in the upper portions of Figs. 1 and 2. It consists of companion arms F F, rigidly attached at right angles to the traveling belt or ropes R R. Fig. 3 gives a detailed perspective view of this frame during ascent, and shows the companion arms F F, supported by the companion braces H H, hinge-jointed at *j j* to the belt or parallel ropes, or to the bar or round J, connecting them, and engaging the lugs or ears *m* on the outside of the arms, these braces having fallen into this active position through gravitation. An equivalent construction would be a simple pin on the arm engaging a suitable notch on the brace. This motion may be limited by the lugs or ears on the arms, or by such a construction of the joints or hinges *j j* and *l l* as shown here, or in any other well-known way. The companion braces G G have fallen away from the lugs or ears *n* on the inside of the arms, back beside the belt or ropes R R through gravitation, and form a back to the platform, which may be made more solid by the connecting bars or rounds *e*, *f*, and *g*, if desirable, for small packages. A carrying-platform may be pivoted to the arms F F or solidly affixed therein, suitable openings being left to accommodate the braces and their movements. When this platform-frame has made the topmost revolution, as shown most clearly in the upper portions of Figs. 1 and 2, and is descending, the braces H H have fallen back beside the belt or ropes R R and become a back to the reversed platform, and the braces G G have fallen outward into position of active support into the lugs or ears *n* of the arms F F, such motion being limited, as previously described. The reverse side of the platform is now topmost and entirely clear for lowering a load. It is plain that a platform-frame so constructed is always rigidly braced when carrying a load during ascent and during descent, and yet flexible enough to accommodate itself to the revolutions of the endless traveling belt, while the platform is equally clear and serviceable during journeys up or down.

My self-unloading carrying-platform and its manner of attachment in the arms of the platform-frame are most distinctly shown in perspective detail by Fig. 5, and in the details of construction and operation by the section on the median line of its length in Fig. 6. This platform is here shown capable of oscillating in two directions, which enables it to dump its load during ascent or descent. In Figs. 5 and 6 the braces are removed for the sake of distinctness; but the mode of adapting this platform to any or all the frames previously described will be manifest to any skillful me-

chanic. The platform P is pivoted, as by the rod *a*, to the arms Q Q, so that it shall overbalance outward unless this tendency be restrained. When so hung and loaded the weight of the load itself is the power that dumps the load, and thus no extra power is needed, and the power usually so expended is saved. For round loads, like barrels, the surfaces of the platform may be made concave. It remains only to provide means to control this power in the time, direction, and extent of its action, and this means may advantageously be made automatic. The construction and operation of such automatic means are shown in the lower portions of Figs. 1 and 2, in enlarged perspective detail at Fig. 5, and in sectional detail at Fig. 6. It is manifest that these means may be manually operated, if preferred, at the several floors, and the means may be so located with reference to the platform and operator as to be most convenient. Means of controlling the oscillation of this self-unloading platform in direction, time, and extent, as here shown, consist in a catch-bolt, *b*, at the rear end of the platform, adapted to engage the back part of the platform-frame, as the bar K or Z or N, and thereby conjointly with the pivot *a* hold the platform horizontal with the supporting-arms throughout revolution, or until the catch-bolt be disengaged by hand or otherwise. Means of limiting the oscillation of the platform in either direction, as here shown, consist in opposite curved arms from the catch-bolt, each terminating in a hook or stop suited to catch upon the back part of the platform-frame, as upon the bar K or Z or N. This construction is shown in Figs. 5 and 6, and this manner of operation is indicated by broken and dotted lines. To render these means of controlling and limiting the oscillation of this platform automatic at certain desired points, I employ at such points a cam, like X, fitted and located to push back the catch-bolt by its curved arms, thereby disengaging the bolt from its keeper and allowing gravitation to dump the load, as hitherto described. In the lower portion of Fig. 1 is shown this operation, the cam X being about to act to dump a load on the floor E' on the ascent of the elevator, and the cam Y to dump a load on the floor E^5 on the descent of the elevator, both simultaneously. This view may be supplemented by the section shown in Fig. 6, wherein the dotted and broken lines respectively indicate the oscillations of the platform in opposite directions according as it is ascending or descending. The ends of the arms of the catch-bolt, which have sliding contact with the cams X or Y, may be shaped like knobs, as shown, or fitted with rollers or any ordinary means of overcoming friction.

When heavy loads are carried, and consequently the lines of ascent and descent become distorted by the sagging of the chain, side guides may be provided in the shape of grooved uprights on each side of the ascending and descending sides of the endless belt, adapted to receive and conduct them in a proper path, as by means of extensions from any or all of the bars I, K, J, N, O, V, Z, or W, and the extending arms may be furnished with friction-rollers or any of the ordinary means of reducing friction; or these extending arms may have suitable jaws or gibs to run on guide-posts.

What I claim as novel and useful and my invention is—

1. A package-elevator constructed and composed of companion endless ropes, preferably of wire, connected together by and carrying a platform or a series of platforms adapted to bear loads, and traveling upon and around suitable pulleys provided at each terminus.

2. A package-elevator constructed and composed of companion pairs or series of endless ropes or bands, preferably of wire or steel, whereby greater tractive power is acquired.

3. In an endless package-elevator, a platform frame or support constructed and composed of companion arms hinged to the traveling belt, each braced in position by a brace jointed respectively to the arm and to the traveling belt or its equivalent, whereby the frame-work becomes flexible enough to turn the pulleys around which the belt travels.

4. In an endless package-elevator, a platform frame or support constructed and composed of companion arms rigidly affixed at right angles to the traveling belt, each arm having an upper and a lower brace, each brace hinged respectively to the belt and to a sliding box or its equivalent, embracing the arm and movable thereupon, whereby the frame-work becomes flexible enough to turn the pulleys around which the belt travels.

5. In an endless package-elevator, a platform frame or support constructed and composed of companion arms rigidly affixed at right angles to the traveling belt, each arm provided with an upper and a lower brace hinged to the traveling belt and automatically movable, respectively and alternately on ascent and descent, from position beside the belt to position for bracing the arm, whereby the platform-frame is always braced firmly and its topmost surface always left clear for carrying loads.

6. In an endless package-elevator, a self-unloading carrying-platform pivoted back of its middle to and also fastened or caught horizontally in a platform-frame borne by the traveling belts, whereby a load tends to overbalance the platform and dumps itself when the platform is released from its horizontal fastenings.

7. In an endless package-elevator, a self-unloading carrying-platform pivoted back of its middle to frame-work borne by the traveling belt and held horizontal therein by a catch engaging therewith and automatically disengaged at any desired point or points by cam-like mechanism.

8. In an endless package-elevator, a carrying-platform borne by the traveling belt or

equivalent, constructed to carry and discharge its load during either ascent or descent.

9. In an endless package-elevator, a self-unloading carrying-platform, constructed to dump its load automatically at desired points by cam-like mechanism there located during ascent or descent, or both simultaneously.

10. An endless package-elevator bearing a series of carrying-platforms constructed and adapted to raise and lower loads simultaneously.

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