M. U. BERNHEIM.

CONVEYER.

APPLICATION FILED MAR. 2, 1908.

1,106,618. Patented Aug. 11, 1914.

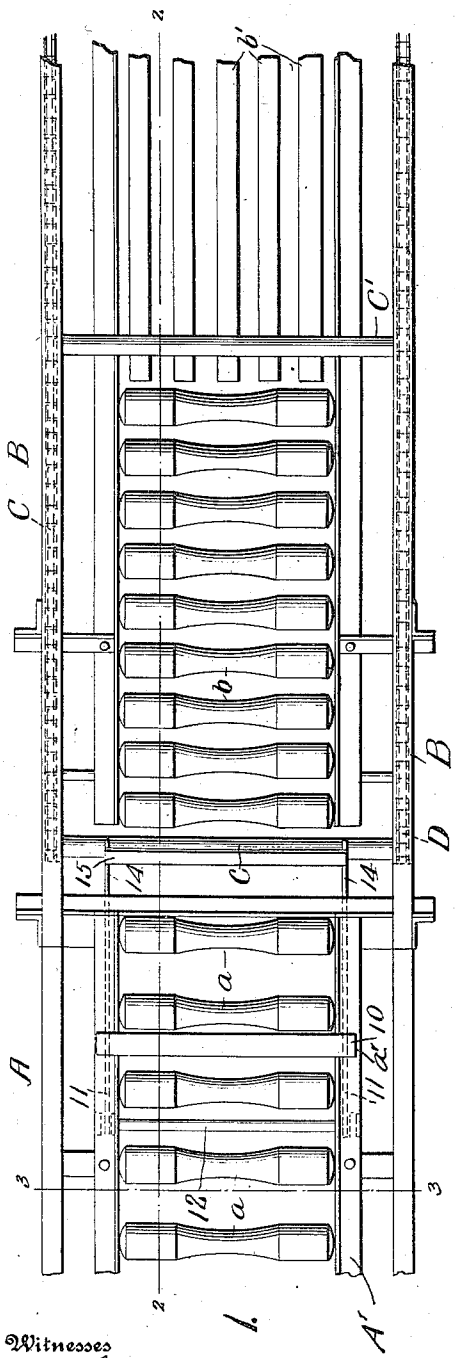

Fig. 1.

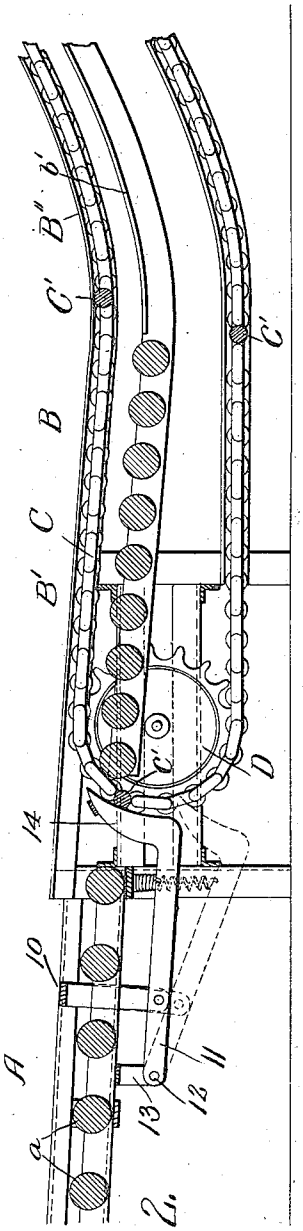

Fig. 2.

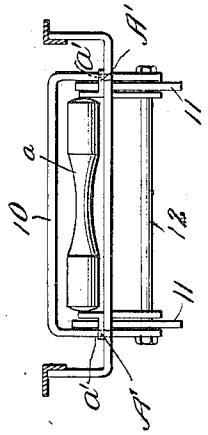

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

MORRIS U. BERNHEIM, OF LOUISVILLE, KENTUCKY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE ALVEY-FERGUSON COMPANY, OF OAKLEY, OHIO, A CORPORATION OF OHIO.

CONVEYER.

1,106,618. Specification of Letters Patent. Patented Aug. 11, 1914.

Application filed March 2, 1908. Serial No. 418,673.

To all whom it may concern:

Be it known that I, MORRIS U. BERNHEIM, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Conveyers, of which the following is a specification.

This invention has relation to freight conveyers, or conveying systems, for transferring from one place to another in a warehouse or elsewhere, boxes, barrels upon end, and other non-rotatably disposed articles (hereinafter generically referred to as "packages") and more particularly to the type of such conveyers in which the packages are automatically fed one at a time to a power conveyer comprising a suitable bed and endless-traveling devices provided with package-engaging elements which propel the packages along said bed, or control the movement of the packages thereon.

The conveyer to which the present invention has most particular reference comprises a delivering section and a receiving section arranged end to end, the delivering section being preferably a gravity conveyer and the receiving section being preferably an elevator having an upwardly inclined bed or way with an approximately horizontal receiving end, said elevator also having package-engaging elements or flights which travel above and below said bed or way and propel the packages along the latter. Such a conveyer is shown in the patent issued May 23rd, 1905 for the invention of B. H. Alvey, but it is to be understood that the present invention is not restricted to the details of the conveyer shown in said patent and that it may be embodied in conveyers having delivering and receiving sections of different styles or constructions without departing from its spirit or the scope of the subjoined claims.

It is well understood by those familiar with conveyers of the kind hereinbefore referred to that when a package is fed to the receiving end of the power conveyer at such time that it will be interposed across the path of a rising flight, the latter by its engagement with the bottom of the package frequently drags it onto the bottom of the elevator and unless some provision is made for freeing the package from the flight by the time the latter has reached the inclined section of the elevator, the package will be dragged partway up the inclined section of the elevator and will then fall back, with danger to the elevator and to the package, as well as danger to the contents of the package when the latter is not an empty box, case or barrel and its contents are of fragile nature. Consequently, with this class of conveyers it is necessary either to provide means for preventing movement of an improperly-engaged package—that is, a package which is riding upon a flight instead of being engaged at its rear by the flight—partway up the inclined section of the elevator, or else for an attendant stationed near the base of the elevator to so time the movement of the packages to the elevator that the packages will reach the receiving portion of the elevator in front of an approaching flight.

The primary purpose of the present invention is to minimize the need of any manual timing of the relation between the periods of arrival of the packages at the elevator and the phases of movement of the propelling devices by providing an automatically operated stop device which will prevent the movement of packages from the delivering section to the elevator when a flight is rising at the receiving end of the latter. This is a leading purpose of the present invention, and other of its purposes are (*a*) to provide a simple and effective form of stop device for a conveyer, (*b*) to provide a stop device of simple and effective form adapted to be automatically operated by the flights of a conveyer of that type in which the flights extend transversely from one carrier chain to another and travel above and below the bed of the conveyer and (*c*) to provide a simple and effective stop device for use in a system comprising a gravity feeder of the roller bed type and a power conveyer of the type hereinbefore referred to. These objects, and others which will hereinafter appear, are fully secured by the construction, arrangement and combination of parts illustrated in the accom-

panying drawings to exemplify what is at present regarded to be the best embodiment of the invention. It is to be understood, however, that changes in the details may be made without departing from the spirit of the invention or the scope of the subjoined claims.

In the drawings, wherein like characters of reference designate like parts in the several views:—Figure 1 is a plan view of parts of a system of conveyers, embodying the present improvements. Fig. 2 is a longitudinal section thereof on the line 2 of Fig. 1. Fig. 3 is a cross section on the line 3 of Fig. 1.

The system herein illustrated comprises two main parts A and B which for convenience of designation will be hereinafter referred to as a delivering section and a power section respectively. These sections are arranged end to end, and with their adjacent ends substantially in the same approximately horizontal plane.

The power section is preferably an elevator similar in construction to that patented to B. H. Alvey May 23rd, 1905, No. 790,811 and it is not considered to be necessary completely to illustrate or describe it more fully herein, further than to call attention to the fact that B′ designates its approximately horizontal receiving portion; B″ its inclined portion; C′ its flights; C C its chains which carry the flights; *b* the rollers which form the bed or way of the receiving portion B′; and *b′* the stationary floor at the junction of the receiving portion B′ and inclined portion B″. It will be understood that while this power section has been referred to as being an elevator, it may be employed for lowering packages, in which event its flights engage the forward walls of the packages and prevent their traveling too fast on the bed or way, and it will also be understood that the power section may be arranged for carrying packages on a level.

The delivering section herein exemplified is a gravity conveyer similar to that patented to B. H. Alvey, Nov. 25, 1902, No. 714,432 and therefore it is only necessary to state that its bed or way is arranged at a downward inclination and is composed of freely rotatable rollers *a*, and that the side members A′ of its frame, which members are preferably angle-irons, as shown, have apertures at the places *a′* for a purpose which will hereinafter appear.

As already suggested, the idea upon which the present invention is founded, is to stop the movement of packages which if not thus restrained would be delivered to the power section at a time to be over and upon instead of in front or behind a rising flight, or other suitable package engaging element, of the traveling means which controls the movement of the package on the bed or way of the power section.

I have illustrated herein a most simple and effective means for the purpose which is characterized by the fact that it comprises a stop 10 arranged in the bed of the delivering section A and having a rising and falling movement produced automatically under the control of the package engaging devices C′.

In the particular illustrated embodiment of the invention the stop consists of an approximately U-shaped strip, arranged in inverted position with its closed end transversely of the bed of the delivering section A and its side members extending through the apertures *a′* in the frame members A′. This stop is preferably arranged somewhat rearward of the discharging end of the delivering section and preferably between two of the rollers *a* of the latter. The lower ends of the side members of the stop are pivotally secured to levers 11, 11 which are arranged at opposite sides of the section A in planes vertically beneath the frame members A′. Their forward ends are secured to a shaft 12 which is journaled in bearings 13 depending from the frame members A′, whereby the levers work in unison. Their rear ends project into the path of the flights C′ and are so correlated with said flights that as the latter, in returning to operative position, successively reach the receiving end of the power section they will engage the ends of the lever and in rising from the returning run to the working run of their travel each will raise said levers and thereby elevate the stop 10 into the path of an approaching package on the delivering section A and will maintain the levers and stop in this position until the flight has reached a place wherein danger of its engaging beneath a package being delivered is obviated. The correlation further is such that when the flight has passed beyond the position at which it would engage the bottom of a package improperly delivered thereto, it will pass freely out of engagement with the ends of the levers and the latter will drop, thereby lowering the stop and permitting a package to be fed from the delivering section to the receiving section. It will be understood that the parts are so arranged that when the stop 10 has moved out of the path of an approaching package sufficient time to effect its delivery onto the power section will elapse before a flight approaching its working position will become operative on the stop mechanism to stop the movement of said package at a place which intersects the path of rising movement of said flight.

The flight engaging ends 14 of the levers 11 have their surfaces which are presented to the flights so formed that when the stop

is elevated said surfaces will be on an arc corresponding to the arc of travel of the flights around the sprockets at the receiving end of the power conveyer B in order that they will operate with a minimum of friction. They are herein shown as being of substantially hook conformation and as projecting beyond the plane of the upper surfaces of the levers sufficiently to extend, when the stop is lowered, to a substantial extent across the plane of travel of the approaching flight and be in position to be engaged by the latter below the horizontal plane of the axes of the sprocket. The flight for raising the levers will remain in frictional contact with the hooks, while traveling relatively thereto, until it has passed substantially to the plane of the bed of the power conveyer, and will then pass freely from its engagement with the hooks, whereupon the levers will fall as before described. Preferably the flights are rotatably mounted on their axes in order to reduce friction between them and the hooks to an extent sufficient to prevent tendency of the flights to bind upon the hooks and stop or retard movement of the traveling elements of the power conveyer. These hooks weight the ends of the levers sufficiently to cause the levers to fall by gravity from the position in which they are shown in full lines in Fig. 2 to that which they normally occupy and which is shown in dotted lines in said figure; but springs or other suitable means may be employed, either to supplement or as a substitute for gravity if desired.

It will be noted that by the employment of the hooks sufficient length of contacting surface for the purpose of the present invention is provided without necessitating an undue width of levers. The hooks are preferably connected with each other by a transversely arranged strip 15 which assures unitary movement of the levers. As already stated, the stop 10 is preferably arranged somewhat forward of the end of the section A. There may be times when a package will be between the stop 10 and the receiving end of the power conveyer, tending to advance toward the latter, while a flight is rising around the sprockets. If the end of this package reaches a plane intersected by the transverse strip, said strip will act to prevent further movement of said package toward the bed of the power conveyer and hence may serve as a secondary stop.

It will be apparent that the described relation between the flights of the elevator and the stop of the gravity conveyer is such that said stop will be projected into the path over which the packages move to the elevator when a flight is rising at the receiving end of the latter. In the use of the conveyers of the kind herein referred to packages—usually empty cases—are placed on the gravity conveyer ordinarily with wide intervals between them and travel at a regulated speed down the gravity conveyer. When the stop 10 rises into the space in advance of an approaching package, as it frequently does, it, by its engagement with the front end of the package, very effectively holds said package from further advancing movement on the gravity conveyer until the flight has passed into the position where it will not engage the bottom of said package. On the other hand, when, as may occasionally happen if no care be taken to avoid it, the stop comes up under the bottom of a package, it will raise said package from the conveyer, or tilt it, and also frictionally resist any further movement of the package on the gravity way. If it should happen to come up under the package near the rear end of the latter and a line of closely following packages are exerting any tendency to press the first package toward the elevator and this tendency is not completely resisted by the stop 10, the front stop 15 will be effective to hold said package away from the rising flight.

Having now described the invention what I believe to be new and desire to secure by Letters Patent, is:

1. A conveying system comprising a delivering section and a receiving section, arranged end to end, said receiving section having a bed or way, and being provided with means for controlling the movement of packages over the way or bed, said means having spaced flights which engage the packages above the bottom of the latter and travel above and below the bed or way, a rising and falling stop for controlling the delivery of packages from the delivering section to the receiving section, and means whereby said stop is automatically moved into package-stopping position under control of the package-controlling mechanism of the receiving section and is maintained in said position until a rising flight has passed beyond the position at which it will engage the bottom of the package.

2. A conveying system comprising a delivering section and a receiving section arranged end to end, said receiving section having a bed or way and being provided with endless traveling devices having transverse spaced flights which travel above and below the bed or way, a rising and falling stop for controlling movement of the packages from the delivering section to the receiving section, and an actuating means for said stop, extending into position to be operated by a flight which is rising at the receiving end of the receiving section, to cause the stop to prevent delivery of a package to

a place intersecting the plane of rising movement of said flight until the flight has passed.

3. A conveying system comprising a delivering section and a receiving section arranged end to end, said receiving section having a bed or way and being provided with endless traveling devices having transverse spaced flights which travel above and below the bed or way, a rising and falling stop for controlling movement of the packages from the delivering section to the receiving section, and an actuating means for said stop having a portion arranged in the path of movement of a flight rising at the receiving end of the receiving section, said portion of the actuating means being substantially concentric with the plane of movement of said flight at the receiving end of the receiving section.

4. A conveying system comprising a delivering section and a receiving section arranged end to end, said receiving section having a bed or way and being provided with endless traveling devices having transverse spaced flights which travel above and below the bed or way, a rising and falling stop for controlling movement of the packages from the delivering section to the receiving section, and an actuating means for said stop comprising a lever having an approximately hook-shaped end arranged in the path of movement of a flight rising at the receiving end of the receiving section.

5. A conveying system comprising a delivering section and a receiving section arranged end to end, said receiving section having a bed or way and being provided with endless traveling devices having transverse spaced flights which travel above and below the bed or way, a rising and falling stop of approximately inverted-U shape and an actuating means therefor comprising a pair of levers each connected to a limb of the stop and having an approximately hook-shaped end arranged to be engaged by a flight rising at the receiving end of the receiving section.

6. A conveying system comprising a delivering section and a receiving section arranged end to end, said receiving section having a bed or way and being provided with endless traveling devices having transverse spaced flights which travel above and below the bed or way, a rising and falling stop of approximately inverted-U shape and an actuating means therefor comprising a pair of levers each connected to a limb of the stop and having a projection arranged in the path of a flight rising at the receiving end of the receiving section and having its surface adjacent to the flight formed on an arc substantially concentric with the arc of travel of the flight.

7. A conveying system comprising a gravity section and a power section arranged end to end, said gravity section having a stop and a lever projecting from the stop, and said power section having a bed or way substantially continuous with the bed or way of the gravity section and provided with means for conducting packages over its said bed or way, said means including spaced flights which travel above and below the bed or way, the lever of the stop projecting into position to be controlled automatically by said conducting means to operate the stop to prevent delivery of a package to the power section when a flight is rising at the receiving end of the latter.

8. A conveying system comprising a gravity section and a power section arranged end to end, said gravity section having a stop and a lever projecting from the stop, and said power section having a bed or way substantially continuous with the bed or way of the gravity section and provided with means for conducting packages over its said bed or way, said means including spaced flights which travel above and below the bed or way, the lever of the stop projecting into the path of a flight rising at the receiving end of the power section and being operated automatically by said flight to prevent delivery of a package to the power section when a flight is rising at the receiving end of the latter.

9. A conveying system comprising a gravity section and a power section arranged end to end, said gravity section having a stop and a lever projecting from the stop, and said power section having a bed or way substantially continuous with the bed or way of the gravity section and provided with means for conducting packages over its said bed or way, said means including spaced flights which travel above and below the bed or way, the lever of the stop having an end curved substantially concentric with the path of rising movement of the flight at the receiving end of the power section and adapted to be engaged by said flight, to operate the stop to prevent delivery of a package to the power section when a flight is rising at the receiving end of the latter.

10. A conveyer, comprising a section having a frame, a package-way, a package restraining element of approximately inverted-U shape extending across said way and movable above and back to the plane thereof, and a pair of connected actuated levers pivotally supported from the frame and to which the side limbs of the restraining element are pivoted, combined with a power section disposed in an endwise relation with the first-mentioned section, and provided with a bed or way and with means for controlling the movement of packages upon the

bed or way, said means including flights which travel above and below said bed or way, and said levers arranged to be operated intermittently under control of the package-conducting means for moving the package restraining element into operative position when a flight is rising at the receiving end of the power section.

11. A conveyer, comprising a section having a package way, a pivotally mounted lever disposed at one side of the plane of said way and provided with a bent portion which extends toward the plane of the way and is provided with a package-restraining element which projects laterally therefrom and extends transversely of the way, combined with a power section disposed in an endwise relation with the first-mentioned section and provided with a bed or way and with means for controlling the movement of packages upon the bed or way, said means including flights which travel above and below said bed or way, the bent part of the lever of the first mentioned section being arranged in position to be operated automatically under control of the power-conducting means of the power section.

12. A conveyer, comprising a section having a package way, levers below said way, pivotally mounted at their forward ends and having their rear ends bent upward toward the plane of the way and a package restraining element connecting the upwardly bent ends of the levers with each other, combined with a power section having means operating upon said bent ends to actuate said levers.

13. A conveyer comprising a section having a package way, a pair of levers pivotally mounted at their forward ends, and a package-restraining element connecting the levers with each other and projecting thence toward the package-way, said element being connected with the levers rearward of the fulcrum of the latter and said levers extending from said element to the rear end of the package way and provided at the latter place with bent ends, combined with a power section, having means operating upon said bent ends to actuate said levers.

14. A conveyer having a package way, a pair of levers pivotally mounted at their forward ends, and a package-restraining element connecting the levers with each other and projecting thence toward the package-way, said element being connected with the levers rearward of the fulcrum of the latter and said levers extending from said element to the rear end of the package way and provided at the latter place with curved ends and a laterally arranged strip connecting said curved ends with each other.

15. A conveyer having a package way and a pivotally mounted lever having stop devices in spaced relation along the length thereof, said stop devices being arranged on the same side of the fulcrum of the lever.

16. A conveyer having a package way, a pair of connected pivotally mounted levers provided with stop elements extending transversely of the way and mounted on the same side of the fulcrum of the levers.

17. A conveyer having a package way, a movable package-restraining element an actuating lever therefor provided with a portion which extends toward the plane of the way, and a second package restraining element which projects laterally from said end.

18. A conveyer having a package way, a movable package restraining element arranged transversely of the way, levers carrying said element and provided with portions which extend toward the way and means connecting said portions with each other and arranged to constitute a second package-restraining element.

19. A conveyer having a package way, mechanism for controlling the travel of the packages along said way, comprising endless traveling devices provided at intervals with package-engaging flights, a pair of levers extending into the path of said flights and means carried by and extending between said levers and adapted in one position of movement to restrain the movement of the packages.

20. A conveyer having a package way, mechanism for controlling the travel of the packages along said way, comprising endless traveling devices provided at intervals with package-engaging flights, a pair of levers having ends with curved faces in the path of said flights, means connecting said ends with each other and arranged adjacent to the plane of the way when the levers are raised, and other means arranged rearward of those first mentioned, for connecting the levers with each other, said other means being arranged above the levers, and a feeding section adjacent to the levers and their connecting means.

21. A conveyer having a package way, mechanism for controlling the travel of the packages along said way, comprising endless traveling devices provided at intervals with package-engaging flights, a lever having an end of curved face-conformations arranged in the path of movement of the flights, and a package-restraining device actuated by said lever.

22. A conveyer having a package way, mechanism for controlling the travel of the packages along said way, comprising endless traveling devices provided at intervals with package-engaging flights, a pair of levers each having an end of curved conformation arranged in the path of movement of

the flights and a package restraining device projecting from said ends and arranged between the same.

23. A conveyer having a package way, mechanism for controlling the travel of the packages along said way, comprising endless traveling devices provided at intervals with package-engaging flights, a pair of levers each having an end with a curved face arranged in the path of movement of the flights, and a package restraining device arranged between said levers and connected thereto.

In testimony whereof I affix my signature, in presence of two subscribing witnesses.

MORRIS U. BERNHEIM.

Witnesses:
F. L. BERNHEIM,
E. P. BERNHEIM.