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S. OLSON

AUTOMATIC FEEDER FOR ELEVATORS

Filed Dec. 10, 1919

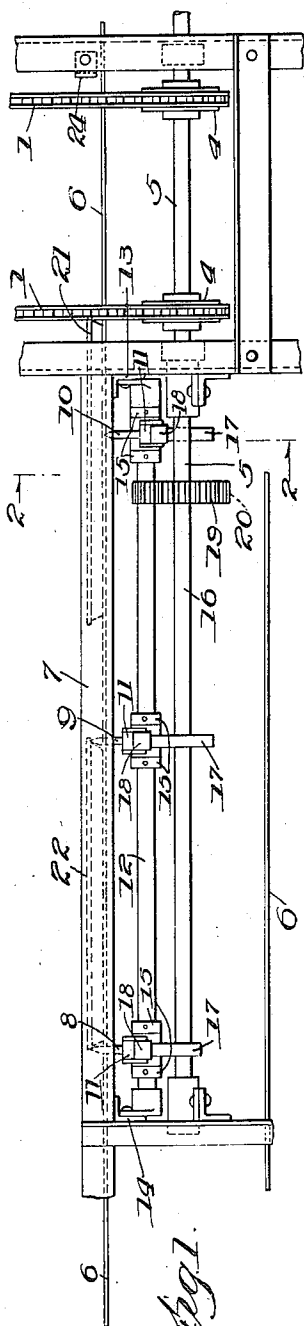


Fig. 1.

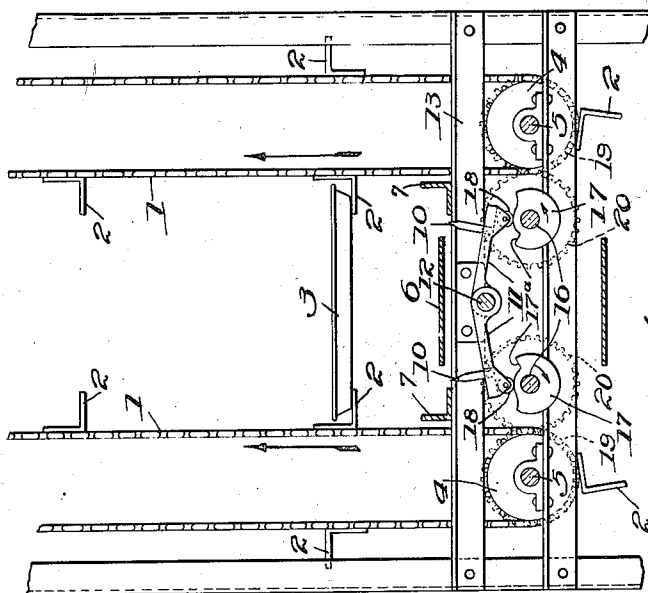


Fig. 2.

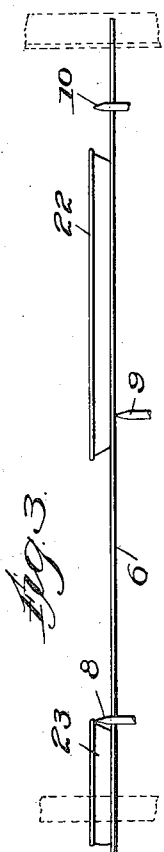


Fig. 3.

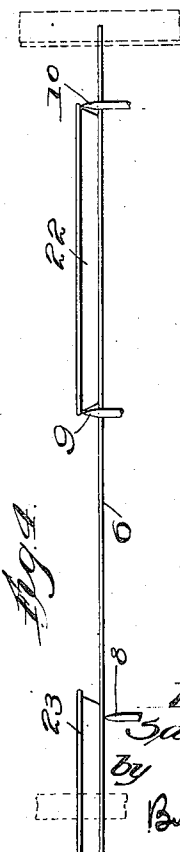


Fig. 4.

Witness:
[Signature]

Inventor:
Samuel Olson,
by
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UNITED STATES PATENT OFFICE.

SAMUEL OLSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO SAMUEL OLSON & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC FEEDER FOR ELEVATORS.

Application filed December 10, 1919. Serial No. 343,716.

To all whom it may concern:

Be it known that I, SAMUEL OLSON, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Automatic Feeders for Elevators, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide means for temporarily arresting the movement of cars, packages, carriers, or the like, over or upon a track or conveyer so as to regulate or control the delivery of such units as in the case of their transfer to another conveyer or an elevator. The invention is illustrated as associated with a horizontal conveyer feeding a continuously traveling elevator, and it consists of the features and elements and their combinations hereinafter described and shown in the drawings, as indicated by the claims.

In the drawings:

Figure 1 is a side elevation of a portion of the horizontal conveyer and a portion of the vertical conveyer or elevator with which the feed control mechanism is associated.

Figure 2 is a vertical section taken as indicated at line, 2—2, on Figure 1.

Figure 3 is a diagrammatic side elevation of the horizontal conveyer belt and certain trays illustrating a position of the trays next succeeding that indicated in Figure 1.

Figure 4 is a diagrammatic view similar to Figure 3 and showing a position of the trays next succeeding that illustrated therein.

The elevator chosen for purposes of illustration is shown as comprising the parallel vertically-traveling chains, 1, which are connected in pairs by the flights, 2, composed of short sections of angle rail,—the flights of one pair of chains being arranged to register with those of the other pair for co-operating to support load-carrying trays such as that indicated at 3 in Figure 2. The chains, 1, are shown passing around foot wheels in the form of sprockets, 4, on shafts, 5, and running horizontally between the two pairs of chains is a conveyer belt, 6, designed to feed the trays to the elevator. It travels in a guideway composed of lateral guide rails, 7, adapted to centrally locate the trays on the belt, 6.

The belt, 6, is made of such a width that there is a slight space between each of its edges and the adjacent guide rail, 7, and for controlling the travel of the trays along said belt, 6, and their delivery to the elevator there are provided three sets of stops, 8, 9 and 10, respectively, adapted to be protruded upwardly through the spaces between the belt edges and the guides, 7, for engaging the trays on the belt and arresting their movement while the belt continues to run at a uniform rate of speed. It will be understood that this method of control applies particularly to cases where the load units carried by the conveyer are propelled either by gravity alone or are engaged only frictionally with the belt if the propelling means is of that nature. Thus in the arrangement shown although the friction between the belt surface and the bottom of each of the trays is sufficient to carry the trays along with the belt if the path of the trays be unobstructed, it offers no embarrassment to the operation when a positive stop is interposed in the path of the trays for temporarily arresting them.

As shown in the drawings, each of the stops, 8, 9 and 10, consists of a pin or post up-standing from an arm, 11, which is loosely fulcrumed upon a rod, 12, extending throughout the distance along which the three sets of stops are distributed and supported at its ends on transverse frame members, 13 and 14. The two stop pins of each pair are disposed in the same transverse line perpendicular to the direction of travel of the belt, 6, and to secure this effect the enlarged end portions of the arms, 11, which engage the rod, 12, may be oppositely offset from this transverse line, either by bending or by halving them. Each pair of stops is positioned longitudinally as desired, by means of stop collars, 15, secured by set screws to the rod, 12, as shown.

For actuating the stops, 8, 9 and 10, a pair of cam shafts, 16, are journaled to extend parallel to the belt, 6, and below the free ends of the arms, 11, each shaft carrying three cams, 17, and the arms, 11, being provided with follower rollers, 18, engaging the peripheral faces of the said cams. As a matter of convenience, since the shafts, 5, of the foot wheels or sprockets, 4, are continuously operating in opposite directions and at

equal speeds, the cam shafts, 16, may be driven from said shafts, 5, by gears, 19 and 20, as indicated in the drawings.

Each of the cams, 17, has a circular outline for approximately 240 degrees, and of such a radius that so long as the follower roller, 18, of the arm, 11, is supported on the circular outline of the cam, the stop in the arm will be up-held in the path of the trays carried by the belt, 6, and in position to arrest such trays.

This circular outline terminates abruptly in a radial shoulder, 17^a, connecting with a portion of the cam surface of considerably smaller radius so as to abruptly drop the stop pin out of the path of the trays and below the plane of the belt, 6, to permit a tray to be frictionally carried forward past the position of the stop. The speed of the belt, 6, is so arranged in relation to the rotary speed of the cam, 17, that the tray will have passed over the stop before the cam has turned as much as 120 degrees past the operative position of the abrupt shoulder, 17^a, and within this 120 degrees the cam is shaped for rather promptly raising the stop into position for again arresting a tray on the belt, 6.

The three cams, 17, on each of the shafts, 16, are set with their abrupt shoulders, 17^a, respectively 120 degrees apart, so that the stops, 8, 9 and 10, will be caused or permitted to withdraw from the path of the trays on the belt, 6, at intervals of one-third revolution of the shaft, 16. The effect of this arrangement upon the travel of the trays is diagrammatically illustrated in Figures 1, 2, 3 and 4. A tray coming along on the belt, 6, will first encounter the stops, 8, if they happen to be at the upper position when the tray arrives at that point, in which case the tray will be arrested by the stops. When the two stops, 8, are withdrawn by the operation of the cams, 17, the tray will be advanced into engagement with the stops, 9, and similarly when these stops are withdrawn the tray will again advance, this time to be arrested by the stops, 10. Then upon withdrawal of the stops, 10, the tray will advance to the position illustrated in Figure 1 at 21 from which it will be carried between the elevator chains, 1, arriving at substantially the correct instant to be picked up by the flights, 2, and thus entirely disengaged from the belt, 6. However, a stop bar, 24, may be provided to arrest the travel of the tray if it should arrive before the flights, 2, have reached the level of the belt, 6.

Preferably the order of withdrawal of the stops is 10—9—8, and with this arrangement it will be evident that after the stops, 9, are lowered to permit advance of the tray, 21, up to the stops, 10, and before the stops, 10, have withdrawn to permit further advance of the tray, 21, the stops, 8, will be

lowered and will admit a second tray, 22, which will proceed up to the stops, 9, as indicated in dotted lines in Figure 1. Now after the stops, 10, have been depressed and delivered the tray, 21, to the elevator, the stops, 9, will be lowered by operation of the cam, 17, and the tray, 22, will advance toward the stops, 10, as indicated in Figure 3, a third tray, 23, arriving in the meantime at the stops, 8. Next, the stops, 8, will be lowered to admit the tray, 23, to a more advanced position limited by the stops, 9, and the cycle will be repeated by withdrawal of the stops, 10, admitting the tray, 22, to the elevator, as in the case of the tray, 21, already described.

It will be understood that additional trays arriving behind the tray, 23, or any tray in engagement with the stop, 8, will be arrested by engagement with that tray itself, and further, that where the trays employed are formed as shown in the drawings with a beaded edge and somewhat flaring flange, the distance between the stops, 8, and the stops, 9, being substantially equal to the length of one of such trays, there will be a space formed between the flaring flanges of any two trays which may travel forward together upon the lowering of the stops, 8, and this space will permit the said stops, 8, to be raised behind the forward tray which has advanced to the stop, 9, and in front of the next tray to prevent further advance of it until the next lowering of the stops, 8. This feature of construction of the trays as shown, or any other corresponding feature of the carrier unit which necessarily forms a small space between successive units in contact with each other on the belt, 6, permits the load carriers or trays to be separated from each other and delivered at regular intervals regardless of how closely they accumulate on the belt, 6, back of the first set of stops, 8.

On the other hand when the belt, 6, is not crowded it may happen that a tray will arrive at the stops, 8, while they are still depressed but will not travel completely over them before they begin to protrude above the plane of the belt, 6. In such event the tray may be arrested upon the points of the stops, 8, or it may be advanced entirely into contact with the stops, 9, but in any case the provision of three sets of stops takes care of this situation with greater certainty than if but two sets of alternating stops were provided, and insures that the tray will be taken into complete control by the stop system at a safe distance from the point of final delivery.

I claim:—

1. In combination with a guideway for packages, means for spacing said packages at regular intervals comprising a series of three stops distributed longitudinally of the

guideway at intervals not less than the length of a package and each mounted for movement independently of the others, together with means for moving said stops in predetermined relation to each other.

2. In combination with a guideway for packages propelled therealong by a continuously acting force, means for spacing said packages at regular intervals comprising a series of three stops distributed longitudinally of the guideway at intervals not less than the length of a package, together with means arranged for causing each of said stops to withdraw from the path of packages, while the other two stops remain projected in position for arresting packages.

3. In the combination defined in claim 1, the means for moving said stops including a cam shaft extending longitudinally of the guideway with three cams thereon distributed at intervals to register with the stops respectively for actuating them.

4. In the combination defined in claim 1, the said means for moving said stops including a cam shaft with three cams thereon, each formed to co-operate with one of the stops, each cam having a part adapted to hold its stop in position for arresting packages during part of the revolution of the cam shaft, and another portion adapted to cause or permit sudden withdrawal of the stop from arresting position, said cams being relatively arranged on the shaft to cause or permit withdrawal of only one stop at a time.

5. In the combination defined in claim 1, the said means for moving said stops including a cam shaft with three cams thereon, each formed to co-operate with one of the stops, each cam having a part adapted to hold its stop in position for arresting packages during part of the revolution of the cam shaft, and another portion adapted to cause or permit sudden withdrawal of the stop from arresting position, said cams being relatively arranged on the shaft to cause or permit withdrawal of only one stop at a time, and each cam having a portion adapted to return the withdrawn stop to arresting position before withdrawal of another stop.

6. In combination with a conveyor comprising a horizontally traveling belt; load carriers supported thereon and frictionally engaging said belt but laterally overhanging it; guide rails laterally spaced from the edges of the belt but positioned to center

said carriers thereon, and one or more pairs of controlling stops disposed in the spaces between the edges of the belt and the guide rails, the stops of each pair being disposed in the same line perpendicular to the direction of belt travel.

7. In combination with a conveyor comprising a horizontally traveling belt with packages supported thereon frictionally engaging said belt and laterally overhanging it, guide rails laterally spaced from the edges of the belt positioned to center said packages thereon and means for spacing the packages at regular intervals comprising stops arranged in pairs for protrusion between the edges of the belt and the guide rails, the stops of each pair being disposed in the same line perpendicular to the direction of belt travel, and each pair of stops being spaced from the adjacent pair by a distance not less than the length of a package, together with means for moving said stops in predetermined relation to each other comprising a pair of cam shafts extending longitudinally of the belt, with cams thereon associated with the respective stops and means for rotating the shafts together for simultaneously actuating the stops of each pair.

8. In the combination defined in claim 7, a rod extending longitudinally of the belt at the middle of its width, with arms fulcrumed thereon in pairs, the arms of each pair extending laterally in opposite directions and carrying the transversely aligned stops and said cam shafts extending parallel to the fulcrum axis at opposite sides thereof for registration of their cams with the respective stop-carrying arms for actuating them.

9. In the combination defined in claim 7, a rod extending longitudinally of the belt at the middle of its width with arms fulcrumed thereon in pairs, the arms of each pair extending laterally in opposite directions and carrying the transversely aligned stops adjustably positioned on the rod by means of stop collars slidable on said rod and disengageably fixed thereto and said cam shafts extending parallel to the fulcrum axis at opposite sides thereof for registration of their cams with the respective stop carrying arms for actuating them.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 19th day of November, 1919.

SAMUEL OLSON.