

Oct. 13, 1925.

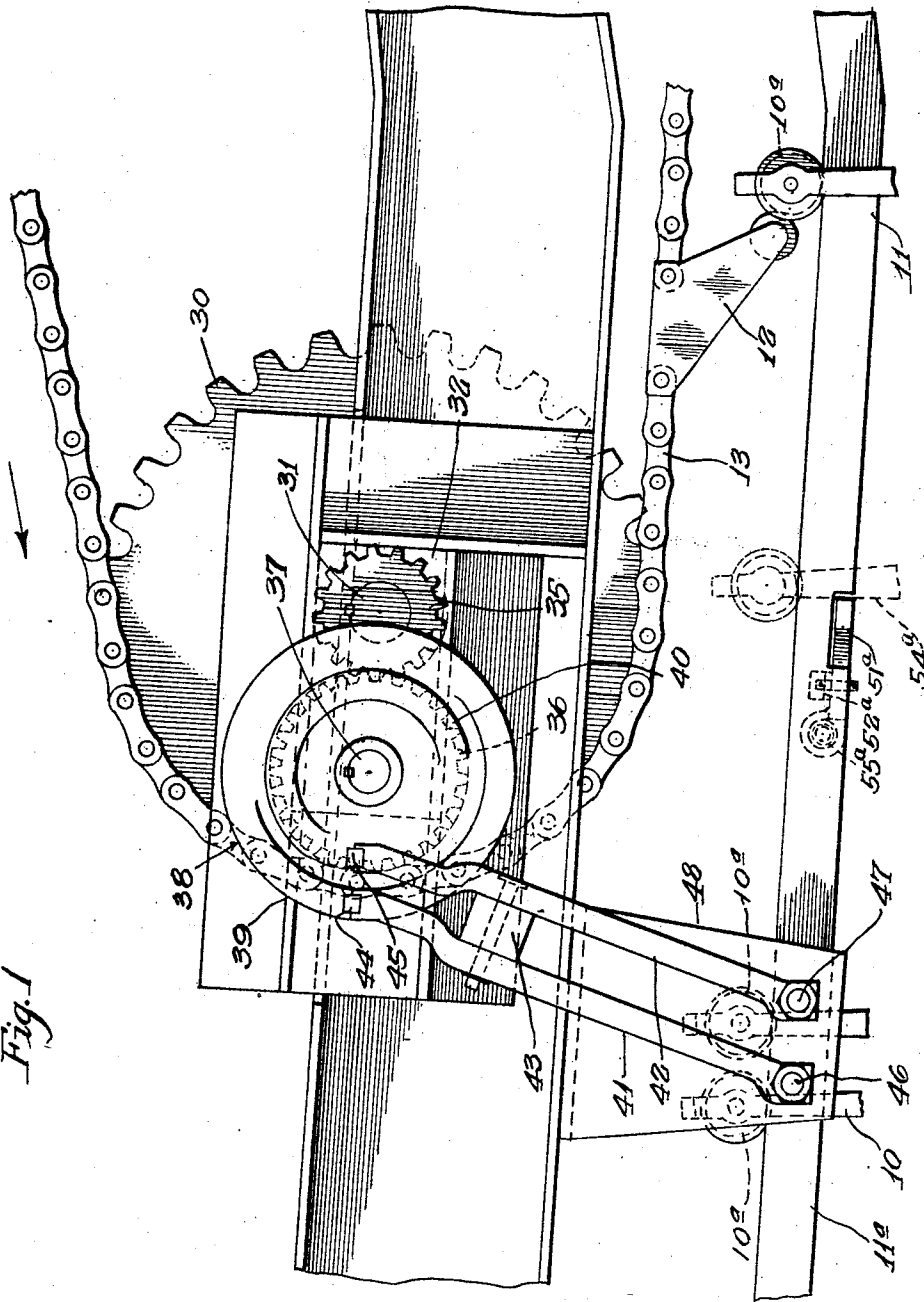
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SPACING DEVICE FOR CONVEYER SYSTEMS

Filed July 26, 1923

2 Sheets-Sheet 1



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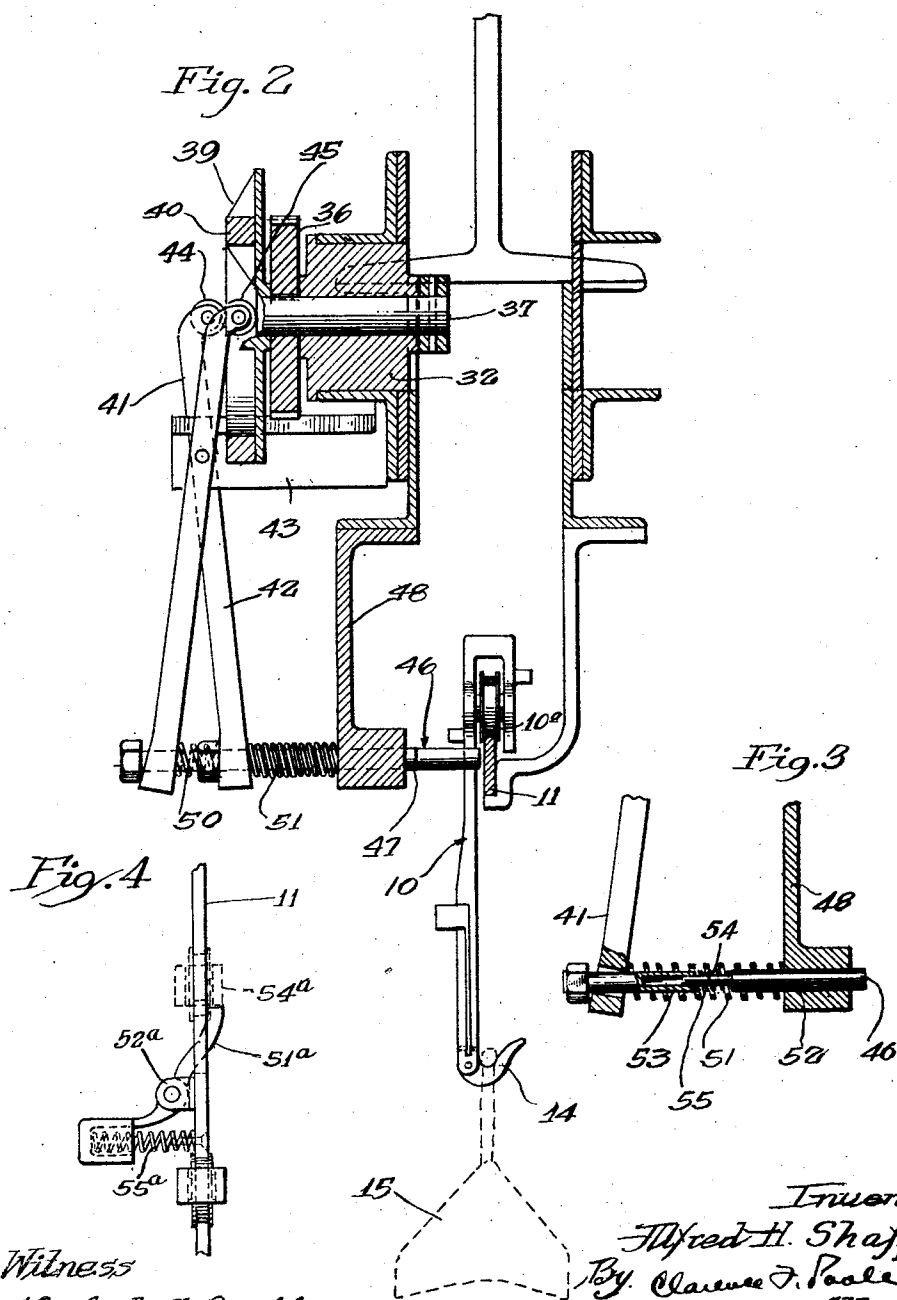
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UNITED STATES PATENT OFFICE.

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SPACING DEVICE FOR CONVEYER SYSTEMS.

Application filed July 26, 1923. Serial No. 653,896.

To all whom it may concern:

Be it known that I, ALFRED H. SHAFFER, a citizen of the United States, residing at Riverside, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Spacing Devices for Conveyer Systems, of which the following is a specification.

This invention relates to improvements in automatic spacing devices for conveyer systems of the class including load-carrying devices adapted to be propelled by an endless conveyer.

The principal object of the invention is to provide means for automatically controlling the initial feeding of the load carrying devices into position to be engaged by the conveyer, whereby said carrying devices are spaced from each other while moving in the system.

The present invention is particularly applicable to conveyer systems such as disclosed in my copending application for U. S. Letters Patent bearing Serial Number 641,314, filed May 25, 1923, and presents certain improvements in the specific embodiment of spacing devices therein disclosed.

The invention may best be understood by reference to the accompanying drawings illustrating one form in which my invention may be embodied.

In these drawings:

Figure 1 is a view in side elevation of a portion of a conveyer system showing one embodiment of my improved spacing device as applied thereto.

Figure 2 is a sectional view taken on line 2—2 of Figure 1, with parts omitted.

Figure 3 is a detail view of one of the stop fingers.

Fig. 4 is a detail view of an automatic stop applied to a conveyer track.

For the purpose of illustration, my invention is shown in the drawings as applied to a monorail conveyer system, including a plurality of load-carrying trolleys 10, 10, having single wheels 10^a, 10^a, mounted for movement along a rail 11. The trolleys are provided with suitable hooks 14, for engagement of a load such as a mail sack indicated at 15, and are propelled by means of projecting members 12, carried at suitable intervals on an endless chain 13.

Figure 1 illustrates that portion of the

conveyer system wherein the trolleys 10, 10 are adapted to be engaged by the projecting members 12 for positive propulsion along the rail 11. The left end portion 11^a of said rail is preferably inclined to permit the trolleys to be fed by gravity toward the conveyer chain 13. Rail 11^a, extended, may thus be used as a loading rail, where the trolleys, with their loads, are initially placed on the rail for dispatching over the system.

Referring now more particularly to the novel features of the invention, the improved spacing device is provided to automatically release one trolley 10 at a time, so as to be engaged by the projecting member 12.

The chain sprocket 30 is keyed on a shaft 31 having bearing in a journal 32. A pinion 35 is keyed on shaft 31, and is meshed with a gear 36 on stub shaft 37. A wheel 38 is also keyed on stub shaft 37, and provided with a pair of cams 39 and 40, concentrically arranged on the outer face thereof. A pair of rocking arms 41 and 42 are pivotally mounted on a bracket 43, and have co-operating engagement with the cam surfaces 39 and 40, respectively. Suitable bearing rollers 44 and 45 may be provided at the ends of the rocking arms, if desired. The lower ends of the rocking arms extend downwardly along one side of the track rail 11 and are connected with horizontally disposed stop pins 46 and 47 respectively. These pins are mounted for longitudinal movement through a support 48 extending downwardly adjacent the rail, as shown. Suitable springs 50 and 51 are interposed between the support 48 and the respective arms 41 and 42, to maintain the latter in engagement with their respective cam surfaces 39 and 40. In the form shown, said springs are coiled about their respective stop pins.

Each of the stop pins 46 and 47 are preferably made up of two members 52 and 53 having limited longitudinal movement respective to each other. For instance, as shown in detail in Figure 3, one member, such as 52, may be formed with a reduced extension 54 having sliding engagement in a cooperating socket in the member 53. A coil spring 55 is inserted between the members 52 and 53.

The pins 46 and 47 are each arranged so

as to be moved into and out of the path of movement of the trolleys 10, 10, by action of their respective cams and rocking arms. As the trolleys 10 are loaded on the track section 11^a they are fed by gravity along the track until they reach a point adjacent the first stop pin 46. If the end of rocking arm 41 is riding on the cam surface of wheel 38 the lower end of said arm will carry the pin 46 inwardly with its end adjacent the track 11 so as to engage and stop the trolley 10, (see Figure 2). The cams 39 and 40 are arranged on opposite sides of the wheel so that the respective rocking arms in engagement therewith are alternately raised and lowered. Said cams however, are preferably arranged in overlapping relation with each other at their ends as shown in Figure 1, so that as the wheel 38 revolves both stop pins will be momentarily extended into a position adjacent the rail 11. Therefore, when the trolley 10 is released by actuation of the rocking arm 41 at the end of cam surface 39, so as to raise pin 46, the second stop pin 47 will already have been moved into position to stop the trolley. The pins 46 and 47 are spaced longitudinally of the rail so as to accommodate a single trolley between them, as shown in Figure 1. When a trolley 10 is locked between the pins 46 and 47 further rotation of the wheel 38 causes the rocking arm 42 to be actuated so as to release this trolley for further movement along the rail 11.

It will now be clear that by means of this arrangement a plurality of trolleys may be loaded into the incline loading track section 11^a and all trolleys will move by gravity until they engage the nearest stop pin 46. As this pin is moved to its outermost position, one trolley may pass under it, but will be stopped by the second pin 47 which is then at its lowermost position. The pins are then moved until the second stop pin is at its outermost position, when the trolley is released and permitted to pass on down the incline rail into position to be picked up by one of the projecting members 12 on the conveyer chain 13. The cam wheel 38 and gearing connections associated therewith are arranged to be driven in timed relation with the conveyer chain 13 so as to pass but one trolley for each projecting member 12.

In the preferred form shown it will be noted that the stop pins are positioned at the side of the track to engage the side frame of the carrying trolleys. This arrangement is preferably in connection with the provision of the longitudinally yielding stop pins 46 and 47. This two-part construction of the stop pins provides a safety tension device in case a portion of the trolley 10 should accidentally get between the end of either pin and the rail. The tension device permits the pins to yield longitudinally with-

out damage to the parts, yet the trolley will be effectively stopped by pressing the trolley frame laterally against the rail, and thus check further movement of the trolley until it is released by the next actuation of the stop pin, and normal operation is resumed. The arrangement of the stop pins at the side of the rail has the further advantage of providing a more positive control of a single wheel trolley of the type disclosed, inasmuch as the trolley is engaged at a point immediately below its center of suspension, so that the positive operation of the device is not affected by the swinging movements of the trolley and its load.

I find it preferable in an apparatus of the class described, to provide a checking device 50, situated on the inclined rail section 11^a at a point where the projecting members 12 on the conveyer chain 13 are adapted to engage the trolleys 10, 10. This device consists of a finger 51^a, suitably positioned to permit passage of the trolley in one direction, but arranged to check its movement in the opposite direction. In the form shown, this finger is pivotally mounted on a bracket 52^a, secured to the lower part of rail 11, and extends to the opposite side of the rail in position to engage the depending portion 54^a of the trolley hanger 14. Said finger is normally held in position by a spring 55^a, but may be moved inwardly to permit the trolley to pass along the track. It has been found by experience, that trolleys carrying relatively heavy dependent loads, contemplated by the apparatus, as described herein, often have a tendency to swing violently while being loaded on the rail, or moved forwardly therealong. This swinging is sometimes sufficient to cause the trolley to progress intermittently, and even to jump backwardly along the rail, thus overcoming gravity temporarily. When this occurs at the time the trolley has reached a position to become engaged by the conveyer, said trolley may either fail to be picked up by the projection, or be struck from above while moving in the opposite direction, whereby the smooth and efficient functioning of the device may be seriously affected, or the parts be subject to excessive wear or even breakage.

I claim as my invention:

1. In a conveyer system, a track, a plurality of carriages, a conveyer adapted for engagement with said carriages, and a spacing device for said carriages comprising a rotary cam device operable in timed relation with said conveyer and a pair of rocking arms actuated by said cam device and controlling the movement of said carriages along said track.

2. In a conveyer system, a track, a plurality of carriages, a conveyer adapted for engagement with said carriages, and a spacing device for said carriages comprising a

rotary cam device operable in timed relation to said conveyer and a pair of rocking arms actuated by said cam device and each provided with a stop-pin, movable into and out of the path of movement of said carriages for controlling the movement thereof along said track.

3. In a conveyer system, a track, a plurality of carriages, a conveyer adapted for engagement with said carriages, and a spacing device for said carriages comprising a cam device operable in timed relation with said conveyer, a pair of rocking arms actuated by said cam device and each provided with a stop-pin movable into and out of the path of movement of said carriages for controlling the movement thereof along said track, and longitudinally yieldable tension means on said pins.

4. In a conveyer system, a track, a plurality of trolleys having dependent load-carrying means, a conveyer adapted for engagement with said trolleys, and a spacing device for said trolleys comprising a cam device operable in timed relation with said conveyer and a pair of rocking arms actuated by said cam device and each provided with a stop-pin movable laterally into and out of the path of movement of said trolleys for controlling the movement thereof along said track.

5. In a conveyer system, a track, a plurality of trolleys having dependent load-carrying means, a conveyer adapted for engagement with said trolleys, a spacing device for said trolleys comprising a cam device operable in timed relation with said conveyer, and a pair of rocking arms actuated by said cam device and each provided with a stop-pin movable laterally into and out of the path of movement of said trolleys for controlling the movement thereof along said track, and longitudinally yieldable tension means on said pins.

6. In a conveyer system, a track, a plurality of trolleys having dependent load-carrying means, a conveyer adapted for engagement with said trolleys, and a spacing device for said trolleys comprising a cam device operable in timed relation with said conveyer, and a pair of rocking arms actuated by said cam device and each provided with a stop-pin substantially opposite said track, movable into and out of the path of movement of said trolleys for controlling the movement thereof along said track and operable when in endwise engagement with

said trolley to restrain forward movement of the latter.

7. In a conveyer system, a track, a plurality of carriages, a conveyer adapted for engagement with said carriages, a spacing device for said carriages comprising a sprocket, a cam wheel geared to said sprocket and provided with oppositely disposed concentric cam segments, a pair of rocking members cooperating respectively with said cam segments and each connected with a stop pin, and a support for said stop pins permitting lateral movement toward and away from said track thereof.

8. In a conveyer system, a track, a plurality of carriages, a conveyer adapted for engagement with said carriages, a spacing device for said carriages comprising a sprocket, a cam wheel geared to said sprocket and provided with oppositely disposed concentric cam segments overlapping at adjacent ends, a pair of rocking members cooperating respectively with said cam segments and each connected with a stop pin, and a support for said stop pins permitting lateral movement toward and away from said track thereof.

9. In a conveyer system, a track, a plurality of carriages, a conveyer adapted for engagement with said carriages, a spacing device for said carriages comprising a sprocket, a cam wheel geared to said sprocket and provided with oppositely disposed concentric cam segments, overlapping at adjacent ends, a pair of rocking members cooperating respectively with said cam segments and each connected with a stop pin, a support for said stop pins permitting lateral movement toward and away from said track thereof, and longitudinally yieldable tension means on each of said pins.

10. In a conveyer system, an inclined track, a plurality of carriages having dependent load carrying means, means for releasing said carriages for progressive movement in spaced relation along said track, a conveyer having means for engaging said carriages beyond said releasing means, and means on said track restraining rearward movement of said carriages after they have reached engaging position relative to said conveyer.

Signed at Chicago, in the county of Cook and State of Illinois, this 18th day of July, 1923.

ALFRED H. SHAFFER.