

Oct. 6, 1942.

J. E. TURNOCK ET AL

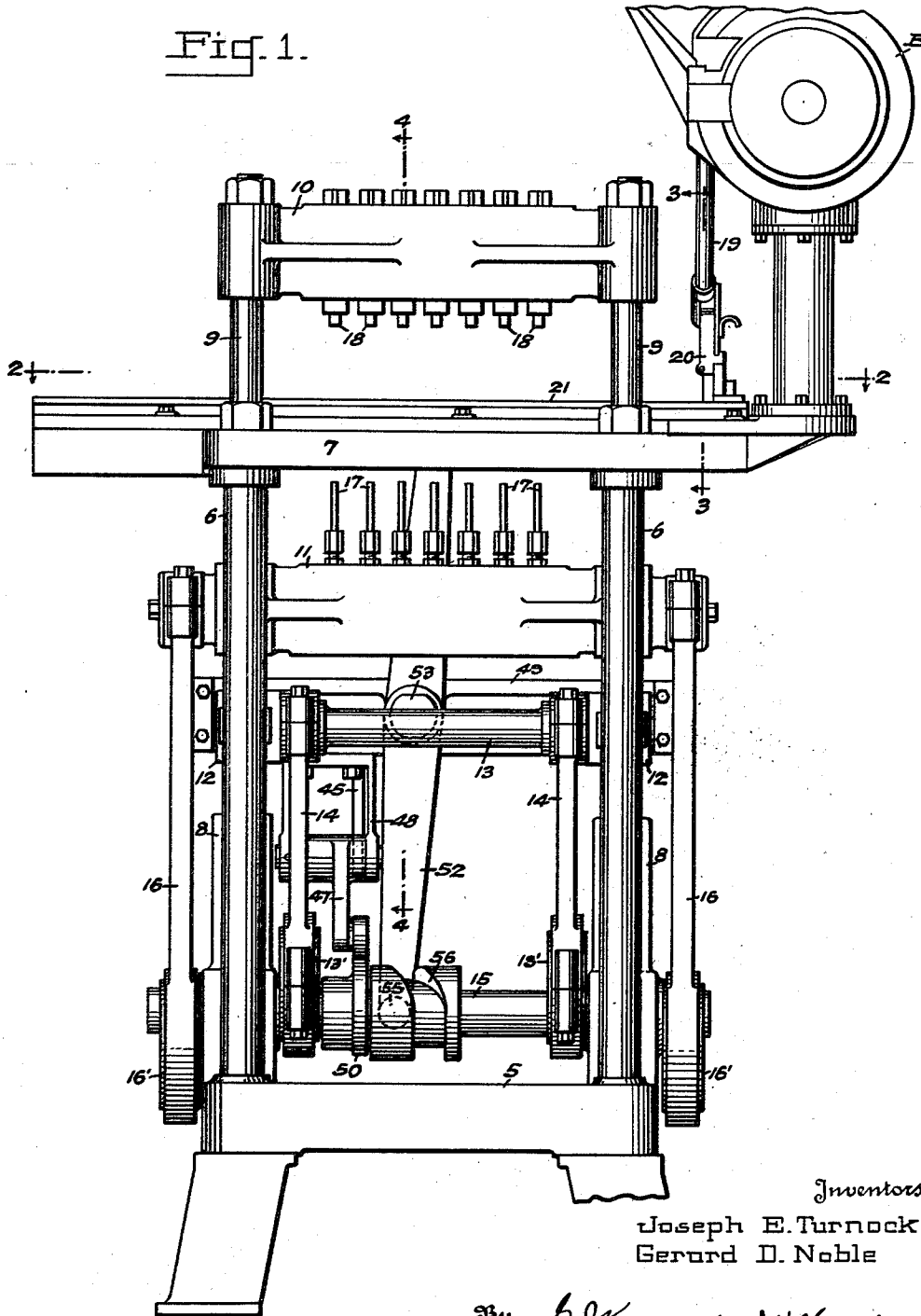
2,297,730

TRANSFER MECHANISM

Original Filed March 27, 1940

5 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

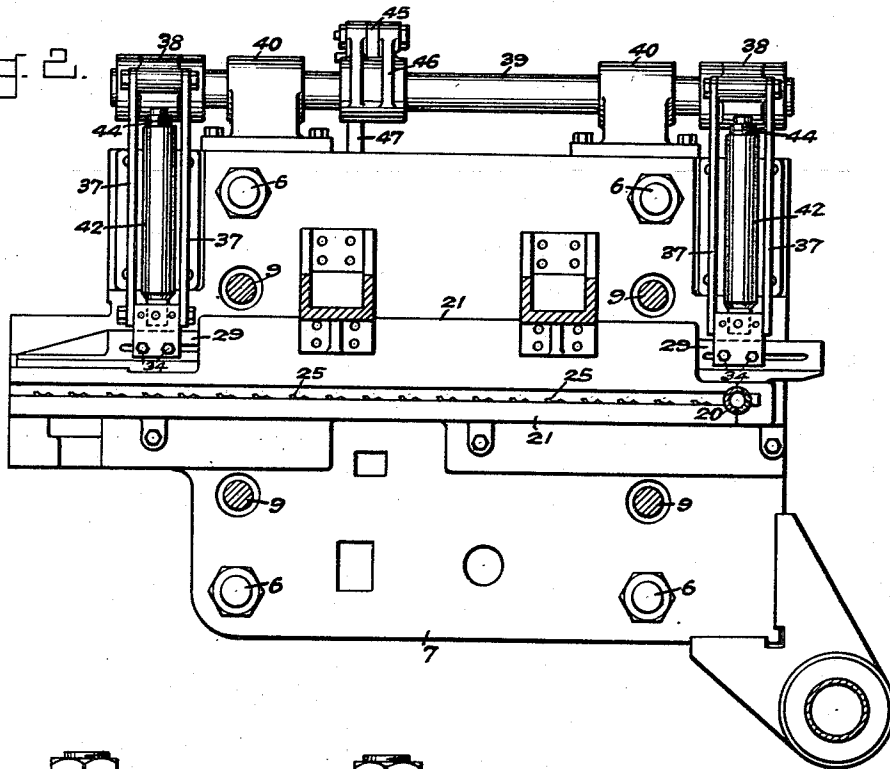
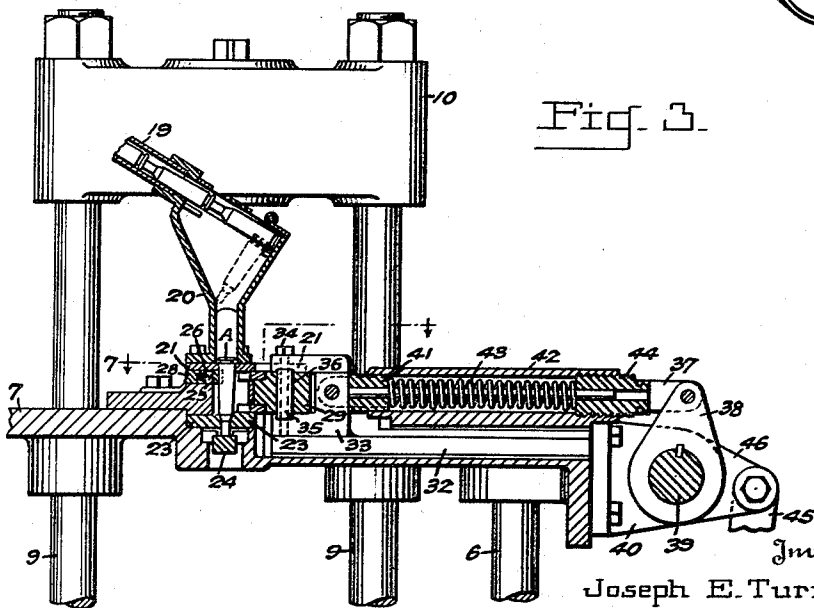


Fig. 3.



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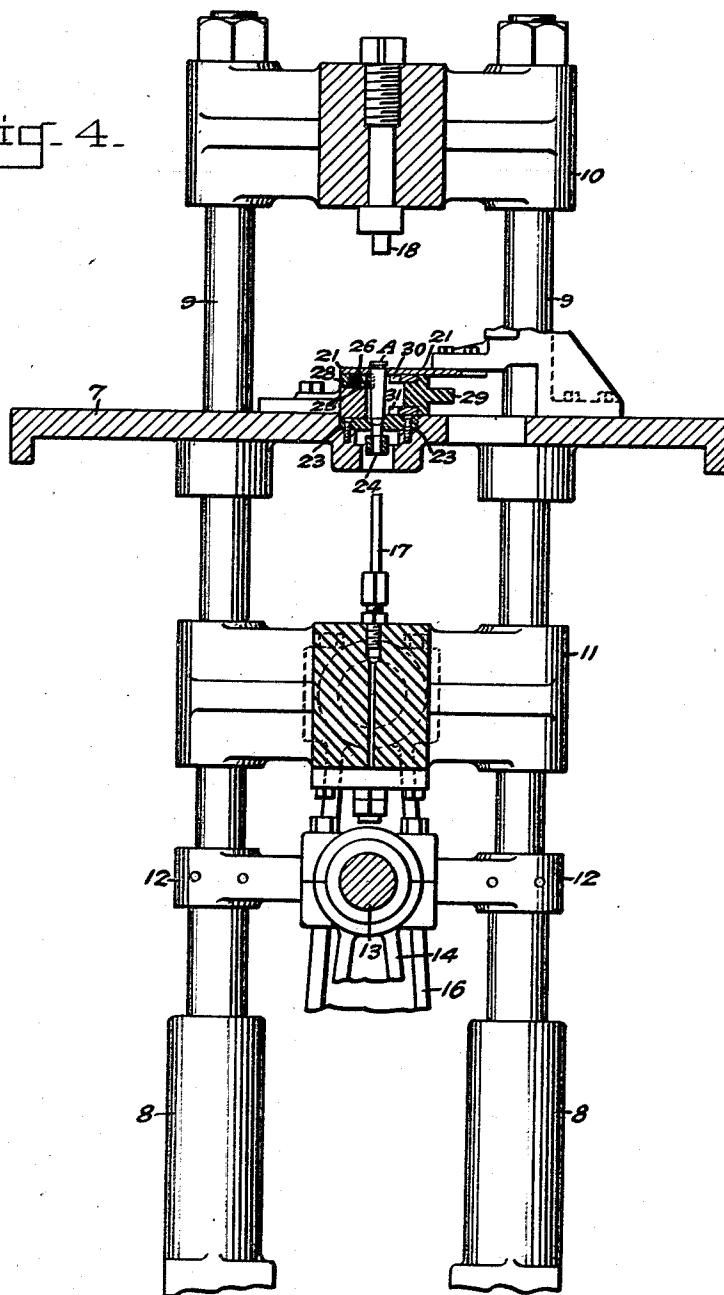
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Fig. 4.



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Fig. 5.

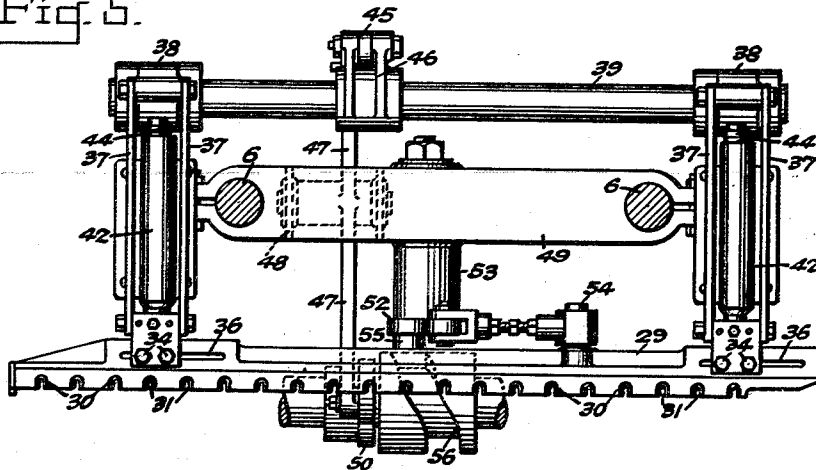
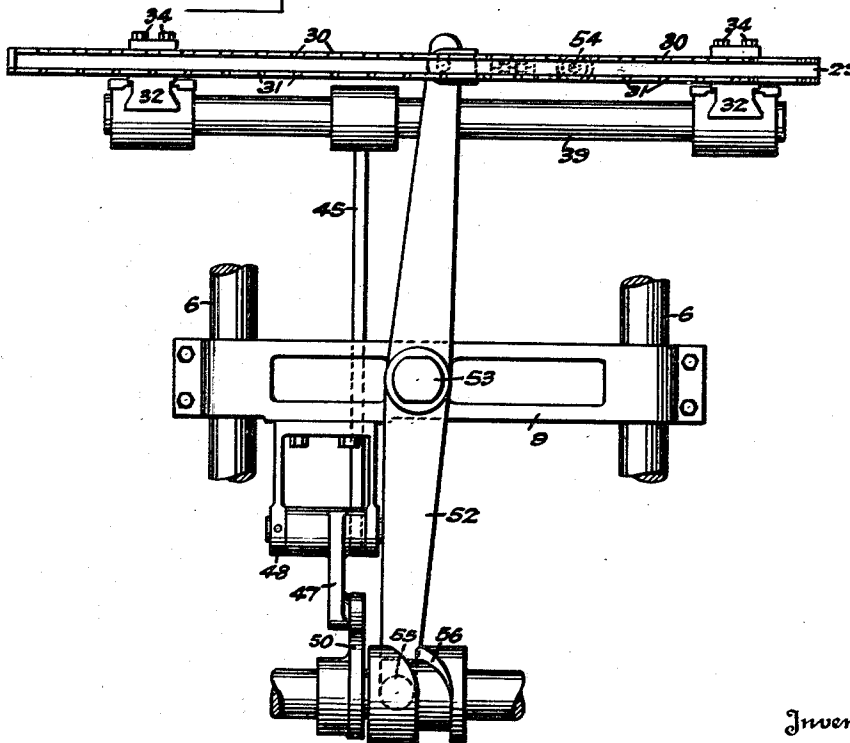


Fig. 6.



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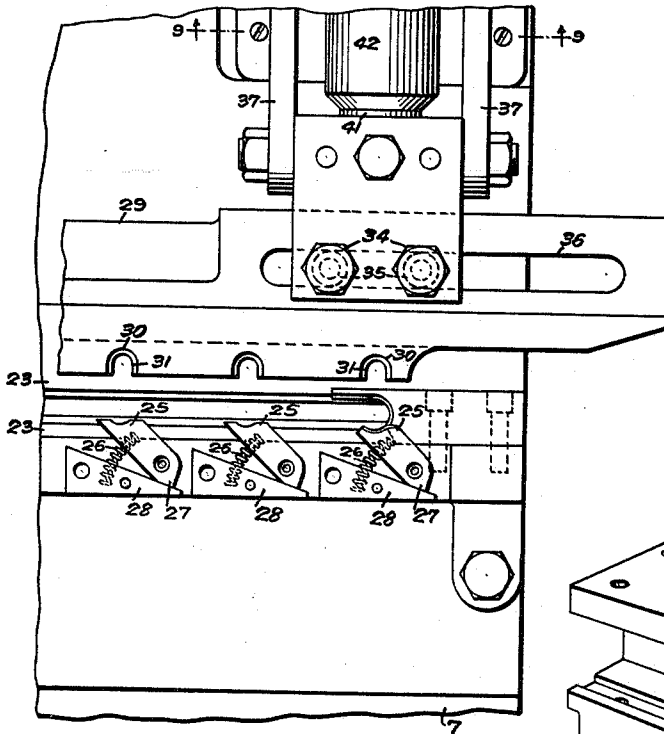


Fig. 7.

Fig. 8.

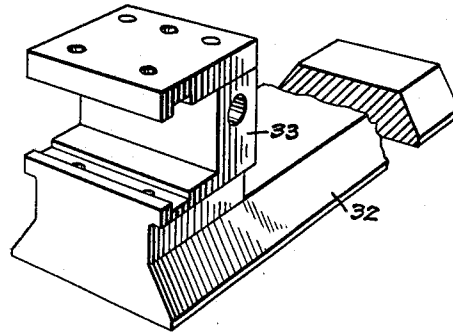
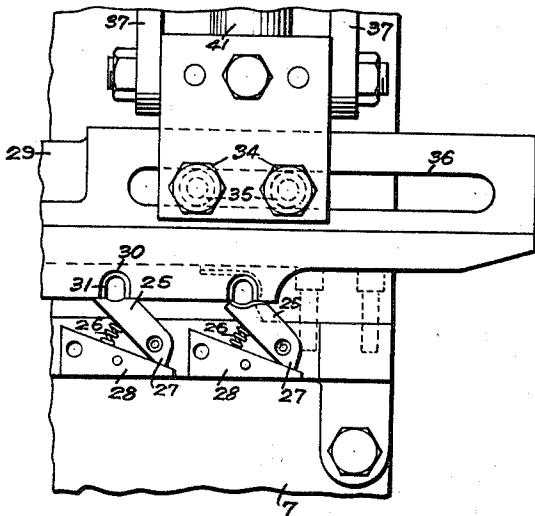
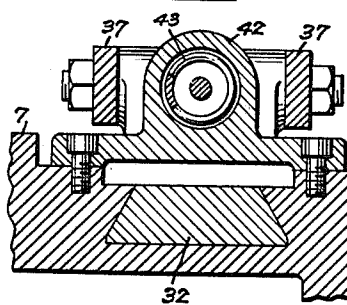


Fig. 10.

Fig. 9.



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UNITED STATES PATENT OFFICE

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TRANSFER MECHANISM

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Original application March 27, 1940, Serial No. 326,208. Divided and this application November 13, 1941, Serial No. 418,994

3 Claims. (Cl. 198—225)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This application is a division of our copending application, Serial No. 326,208 filed March 27, 1940.

This invention pertains to a transfer mechanism, and more particularly to a device for indexing cartridge cases from one work station to another.

The purpose of the invention is to provide a simple, reliable device for indexing work pieces from one station to another and yet maintain them in proper alignment in the guide channel of a machine which is subject to vibration.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Fig. 1 is a view in front elevation of a cartridge assembling machine,

Fig. 2 is a sectional view on the line 2—2 of Fig. 1, parts omitted,

Fig. 3 is a sectional view on the line 3—3 of Fig. 1,

Fig. 4 is a sectional view on the line 4—4 of Fig. 1,

Fig. 5 is a plan view of the transfer mechanism,

Fig. 6 is a view in front elevation thereof,

Fig. 7 is a view on the line 7—7 of Fig. 3,

Fig. 8 is a similar view with the transfer bar in a different position,

Fig. 9 is a sectional view on the line 9—9 of Fig. 7, and

Fig. 10 is a perspective view of an element of the transfer mechanism.

The machine comprises a base 5 which supports columns 6 that sustain a fixed horizontal bed plate 7. Hollow cylindrical guides 8 are secured to the base and support four vertical rods 9 which pass through the bed plate 7 and carry an upper crosshead 10 at their upper extremities, see Figs. 1 and 4. A lower crosshead 11 is slidably mounted on the rods 9 below the bed plate 7. Each pair of rods 9 at the sides of the machine are connected by a bearing member 12 which is fitted to the rods, and the bearing members carry a shaft 13. A pair of connecting rods 14—14 on the shaft 13 are associated with conventional eccentrics 13' on the drive shaft 15. A pair of connecting rods 16—16 on the lower crosshead 11 are similarly associated with eccentrics 16' on the

drive shaft. The eccentrics are oppositely arranged as indicated in Fig. 1 so that the upper and lower crossheads are simultaneously moved toward and from the bed plate 7.

The lower crosshead 11 carries on its upper side a plurality of spaced stems or anvils 17 which are adapted to enter the mouths of cartridge cases A which are arranged in line and in spaced relation in a guide channel on the bed plate, see Figs. 1 and 4. The guide channel and its associated transfer mechanism will be described in detail later. The upper crosshead 10 carries a group of tools 18 which are arranged to engage the bases of the cartridges and are in alignment with the stems 17. The tools 18 perform a series of work and testing operations on the cartridge cases such as burring, venting, inserting a primer, seating and crimping the primer, and also detect for abnormal conditions.

The cartridges are fed one at a time from a hopper B through a tube 19 which terminates in a vertical magazine 20 (Figs. 1 and 3) fixed to the bed plate 7. Suitable means which do not form a part of the present invention invert the cartridges so that they emerge mouth foremost from the magazine. The case now drops between a pair of spaced rails 21—21 (Figs. 2 and 3). The upper portion of the case is disposed in the slot between the two rails 21—21 while its lower shoulder portion rests on a pair of spaced lower guide plates 23 and is supported thereby. The lower edge of the case rests on a bar 24 (Figs. 3 and 4) which is provided with apertures through which the stems 17 pass to enter the case. A side of the cartridge case is engaged by the recessed end of a pivoted holding finger 25 whose movement under the action of a spring 26 is limited by the engagement of a nose 27 with a block 28, see Figs. 2, 7, and 8. A plurality of fingers are provided to correspond to the step by step movement of the cartridge cases across the machine.

The means for imparting a step by step movement to the cartridge cases comprises a transfer bar 29 (Figs. 7 and 8) having a plurality of sets of vertically spaced and aligned recesses 30 and 31 adapted to partially embrace a cartridge case. The transfer bar has a quadrangular motion, advancing from an initial retracted position as in Fig. 7 to the cartridge engaging position of Fig. 8, then feeding one step to the left, retracting, and finally returning to the initial position.

As a cartridge case is advanced by the transfer bar 29 from one pivoted holding finger 25 to the next finger, it is grasped by the recessed end of

the latter finger so as to prevent movement in its guide channel between the spaced rails 21—21 when the bar is retracted to the position shown in Fig. 7. This prevents the cartridge from becoming improperly spaced with respect to adjacent cartridges due to vibrations of the loading machine. When the transfer bar 29 returns to index the cartridge to the next succeeding station, the cartridge is always in proper alignment with a recess 30—31 and is in no danger of it being bent or distorted by the front edge of the bar, thereby preventing jams and increasing the speed of operation and the output of the machine.

The mechanism for operating the transfer bar 29 comprises a pair of slides 32—32 (Fig. 10) mounted in the bed plate 7 (Fig. 9). A block 33 fixed to the inner end of each slide is provided with a pair of bolts 34—34, each carrying a roller 35 disposed in a slot 36 in the transfer bar. Each block is connected by means of a pair of spaced links 37—37 to a lever 38 keyed on a shaft 39 which is journaled in brackets 40. See Figs. 2, 3, 5 and 6. A guide plug 41 on the outer end of each block slides in a tubular housing 42 (Fig. 9) fixed to the plate 7 and acts on helical spring 43 which is seated on the outer plug 44 in the housing (Fig. 3) and serves to advance the transfer bar.

The shaft 39 is rocked by means of a link 45 which connects a lever 46 on the shaft and an angled lever 47 (Fig. 5) pivotally mounted in a hanger 48 attached to bracket 49. See also Figs. 2, 3 and 6. The free end of the lever 47 rides on a cam 50 on the drive shaft 15. A lever 52 pivotally mounted in a bearing 53 carried by bracket 49 has its upper end pivotally attached to a coupling 54 (Fig. 5) on the transfer bar and its lower end provided with a cam pin 55 riding in a cam slot 56 on the drive shaft. This mechanism serves to reciprocate the transfer bar 29.

The operation has been described in connection with the description of the component elements.

We claim:

1. In a machine, a guideway for horizontal travel of objects, spaced fingers for yieldingly holding said objects at intervals on the path of travel, a transfer bar having means for engaging the objects to move them from finger to finger, means for reciprocating the bar over a stroke equal to the spacing between adjacent fingers, resilient means for advancing the bar towards the fingers to engage the objects for movement at one end of its stroke and means for retracting the bar from engagement with said objects at the other end of the stroke.

2. In a machine, a guideway for horizontal travel of objects, spaced fingers for yieldingly holding said objects at intervals on the path of travel, a transfer bar having means for engaging the objects to move them from finger to finger, a pair of slides movable perpendicularly to the axis of the transfer bar, each slide having a driving and a sliding connection with the transfer bar, resilient means normally advancing each slide towards the fingers, means for retracting the slides, and means for reciprocating the transfer bar.

3. In a transfer mechanism, a guideway for longitudinal travel of objects, a transfer bar having means for engaging the objects to advance them in spaced relationship along said guideway, a resilient support adjacent said guideway for yieldingly holding said objects in said spaced relationship along the path of travel, means for reciprocating said bar along said guideway by a stroke equal to the spacing between objects, resilient means for retaining said bar in engagement with said objects during the advance stroke, and means for retracting said bar from engagement with said objects during the return stroke.

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