

May 17, 1927.

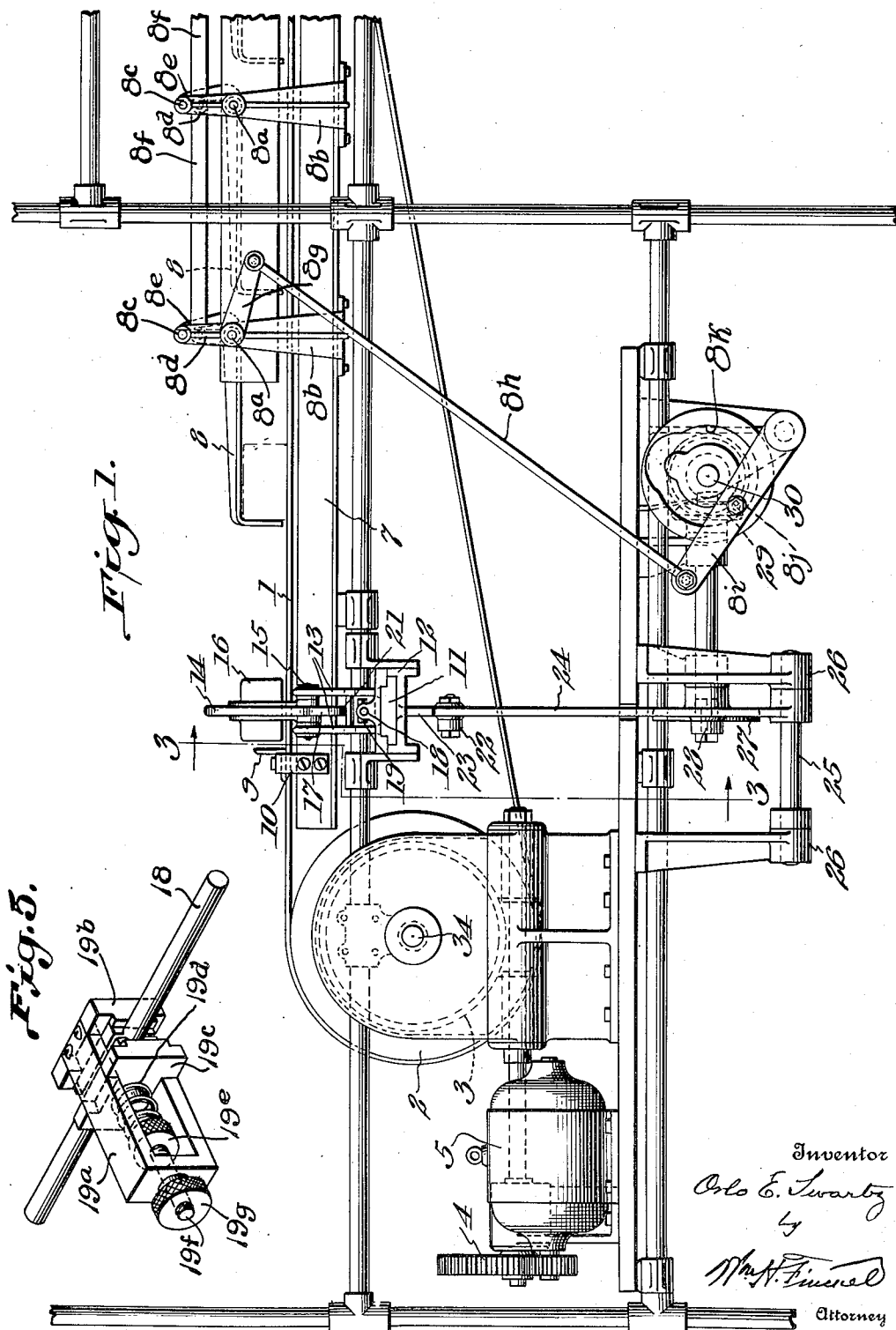
O. E. SWARTZ

1,629,323

TRANSFER DEVICE FOR CONVEYERS

Filed March 10, 1925

3 Sheets-Sheet 1



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May 17, 1927.

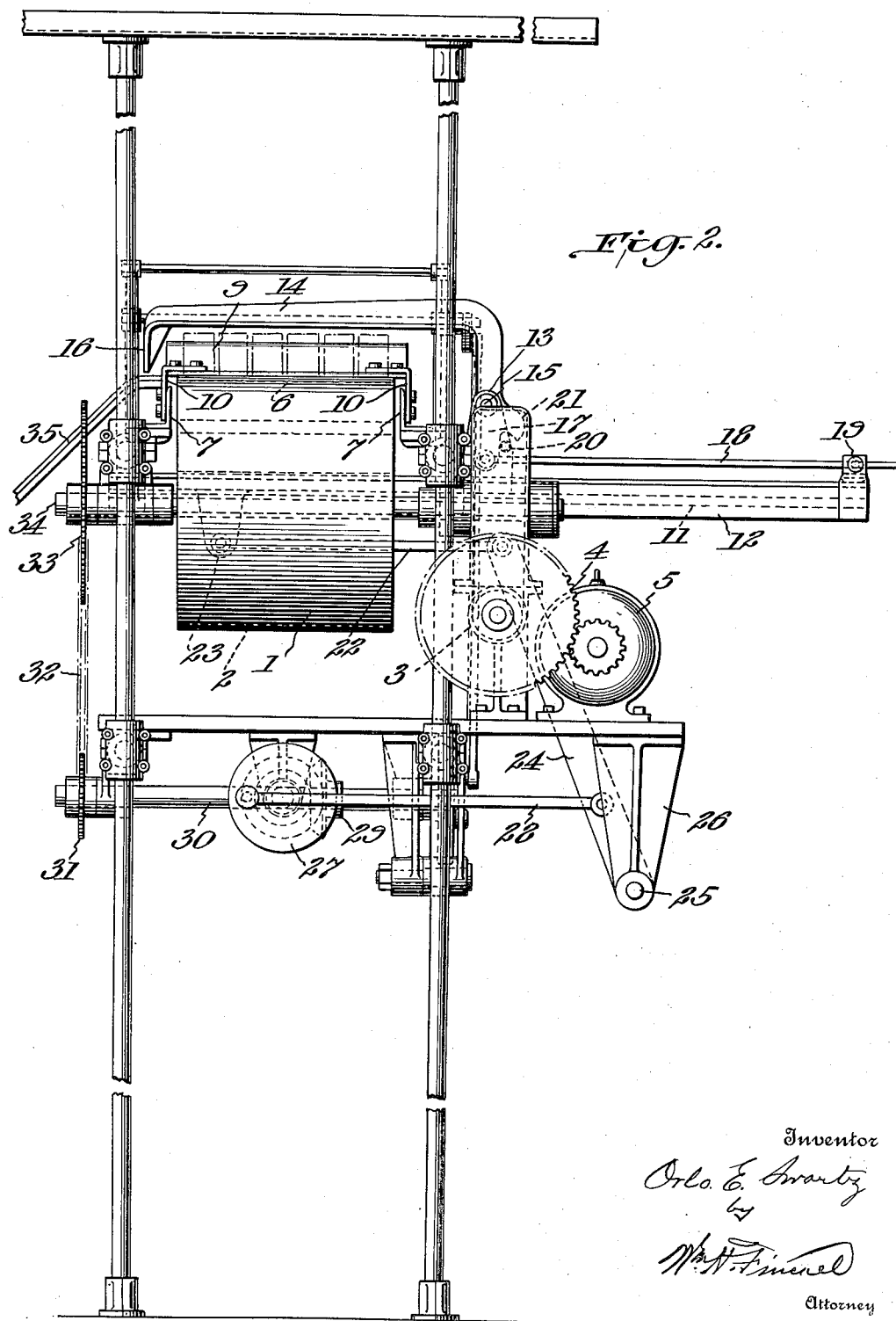
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TRANSFER DEVICE FOR CONVEYERS

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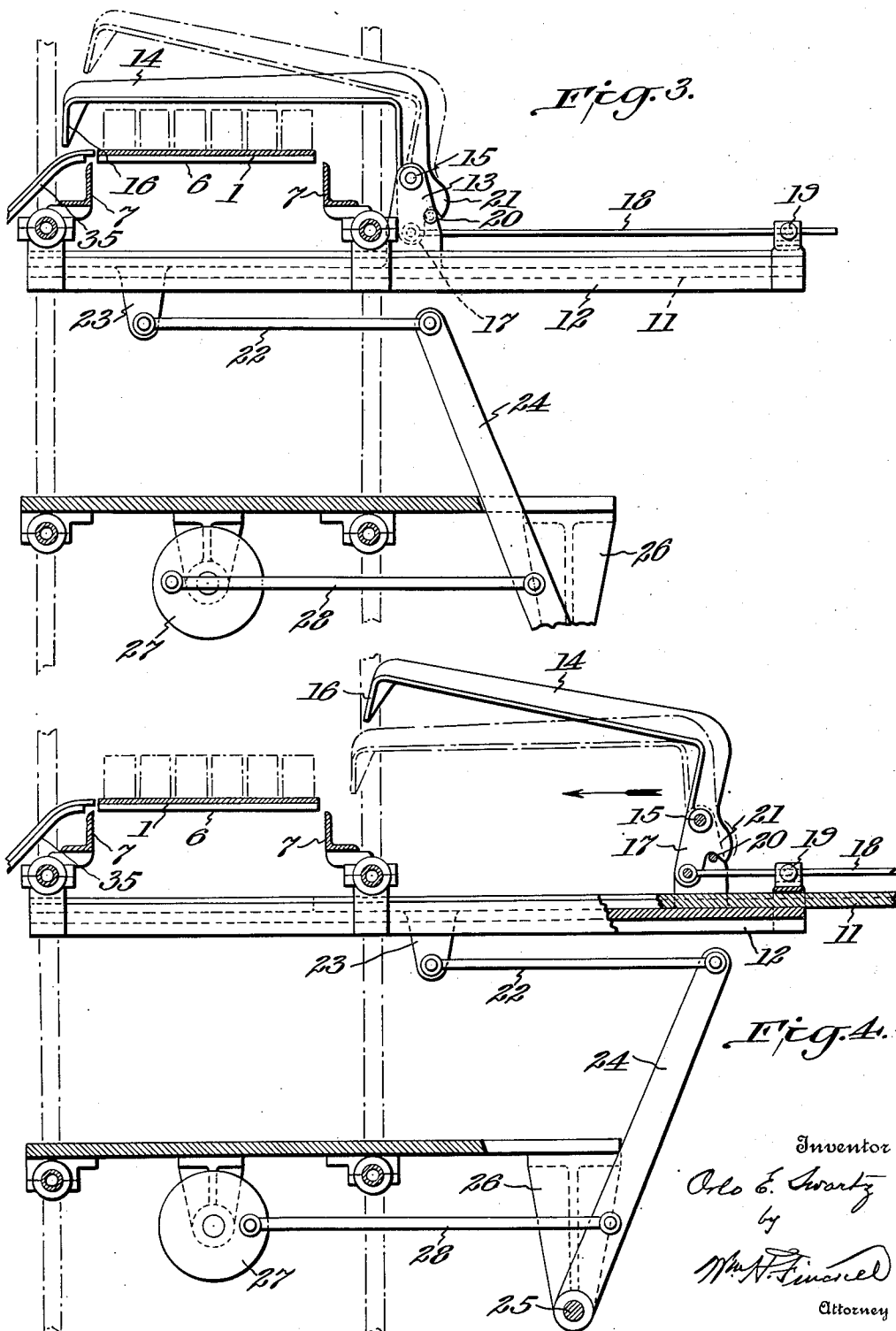
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**1,629,323**

# TRANSFER DEVICE FOR CONVEYERS

Filed March 10, 1925

3 Sheets-Sheet 3



Patented May 17, 1927.

1,629,323

# UNITED STATES PATENT OFFICE.

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## TRANSFER DEVICE FOR CONVEYERS.

Application filed March 10, 1925. Serial No. 14,516.

This invention relates to a transfer device for use with conveyers, and in the embodiment hereinafter particularly described, and as shown in the drawings, is arranged for use with a travelling belt conveyer associated with match making machinery, for receiving the boxed output of a plurality of match machines and conveying such output to a point of collection at which it is discharged from the conveyer and from which it is collected and conducted to a point of further manipulation such as by a wrapping machine.

The object of the invention is to provide a transfer device for use with a conveyer mechanism such as that described in the co-pending application of Harry I. Lahr and Orlo E. Swartz, filed November 8, 1924, Serial No. 748,758, and in which a travelling conveyer belt is arranged in co-operative relation with a plurality of match machines, for receiving the boxed output of such match machines, the transfer device of this invention being adapted to push the boxes of matches in uniform series off of the conveyer belt and into a chute or other transferring means from which they may be collected and transported to a point of further manipulation.

The invention consists essentially in the combination with a conveyer mechanism, preferably of the travelling belt type, of a reciprocable pusher member arranged for reciprocating movement transversely of the conveyer belt with respect to the direction of its travel, means being associated with said pusher member for causing it to assume a position in such proximity to the belt during its operative stroke transversely thereof as to discharge boxes of matches therefrom by pushing the boxes of matches off of the belt, and to raise the pusher member out of match box engaging proximity to the belt upon its return or inoperative stroke thereacross, and means for imparting reciprocatory movement to the pusher member in timed relation to the operation of other devices of the conveyer mechanism, as I will proceed now to explain and finally claim.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of a portion of a belt conveyer and its associated mechanism including the transfer device of this inven-

tion. Fig. 2 is an end view of the parts shown in Fig. 1 and looking toward the left hand side of Fig. 1. Fig. 3 is a section taken substantially in the plane of line 3—3 of Fig. 1 and looking in the direction of the arrows. Fig. 4 is a view similar to Fig. 3, but showing the parts of the mechanism in a different position. Fig. 5 is an enlarged detail perspective view of the friction clutch member.

As hereinbefore indicated, the transfer device of this invention is used in combination with a conveyer mechanism comprising in part a travelling conveyer belt 1 arranged to travel over suitable drums or pulleys 2 arranged at opposite ends of the conveyer mechanism, only one of which is shown. The pulley 2, shown, is the driving pulley for the conveyer belt and is operated by a suitable worm and wheel gearing 3 to which power is imparted by means of suitable gearing 4 from an electric motor 5 or other source of power. The upper or working flight of the conveyer belt 1 is supported upon a suitable bed 6 carried in longitudinal stringers 7 extending throughout the length of the conveyer mechanism, whereby an even horizontal travelling surface of the belt is presented for the reception of boxes of matches deposited upon it by suitable mechanism (not shown) operatively associated with it and with match boxing machines. Suitable trips 8 are arranged at intervals longitudinally of and adjacent to the upper flight of the belt for intermittently stopping boxes of matches travelling thereon to arrange such boxes in uniform series transversely of the conveyer belt. These trips 8 are loosely mounted upon shafts 8<sup>a</sup> carried in brackets 8<sup>b</sup> fixed to the frame stringers 7, and are oscillated on the shafts 8<sup>a</sup> by means of rods 8<sup>c</sup> carried by arms 8<sup>d</sup> fixed on the shafts 8<sup>a</sup> at opposite sides of the belt 1. These rods 8<sup>c</sup> contact with fingers 8<sup>e</sup> forming part of the trips 8 and the arms 8<sup>d</sup> are connected for simultaneous oscillation by means of links 8<sup>f</sup>. Motion is imparted to the links 8<sup>f</sup> by a lever 8<sup>g</sup> fixed on any one of the shafts 8<sup>a</sup> and connected by a link 8<sup>h</sup> with a lever 8<sup>i</sup> carrying a cam-follower 8<sup>j</sup> which cooperates with a cam 8<sup>k</sup> driven by shaft 30 on which it is fixed. A stop member or abutment 9 carried by suitable brackets 10 attached to the stringers 7 is provided for limiting travelling movement of the boxes of matches, and for stopping these

boxes in uniform arrangement transversely of the belt.

The transfer device proper forming the essential feature of this invention comprises a slide 11 mounted in a guide member 12 secured to the stringers 7, and this slide 11 carrier, in suitable bearing members 13, a pusher member or arm 14 pivoted upon a pin 15 journaled in the members 13, and having a down-turned pusher end 16. Below its pivot 15, the arm 14 is provided with a lever end 17 connected by means of a rod 18 with a friction clutch member 19 fixedly carried by the guide member 12. This clutch member 19 (Fig. 5) comprises a U-shaped frame 19<sup>a</sup> carrying at one end a fixed friction member 19<sup>b</sup> between which and an adjustable friction member 19<sup>c</sup> the rod 18 is frictionally grasped. A spring 19<sup>d</sup> bears against this member and against an adjustable stop 19<sup>e</sup> having a threaded stem 19<sup>f</sup> passing through the end of member 19<sup>a</sup> and fixed in adjusted position by a lock nut 19<sup>g</sup>. Downward movement of the arm 14 about its pivot 15 is limited by a pin 20 against which the lever extension 17 strikes, and this pin is arranged to limit also the upward movement of the arm by engagement with it of an abutment piece 21 carried by the lever extension 17.

Reciprocation is imparted to the slide 11 by means of a link 22 carried in a bearing 23 of the slide, and connected with a lever 24 pivoted upon a shaft 25 carried in suitable bearings 26 mounted upon the machine frame. This lever derives oscillatory movement upon its pivot from a crank disk 27 through a link 28. The crank disk 27 is rotated by means of bevel gearing or the like 29 driven from a shaft 30 which shaft is driven by chain and sprocket mechanism 31, 32, 33, receiving power from the shaft 34 of the pulley 2.

This drive of the transfer device being derived from the drive of the conveyer belt will time the reciprocation of the pusher member 14 to the speed of travel of the conveyer belt, and will consequently reciprocate the member 14 at suitable intervals for pushing off of the belt series of boxes of matches arranged by the trips 8, during their advance with the belt.

The operation of this device would seem to be obvious, but in the interest of clearness it may be said that considering the parts as in the full line position, Fig. 4, and assuming that a transverse series or row of watch boxes is advancing upon the conveyer belt 1, the initial movement of the slide 11 in the direction of the arrow will cause the arm 14 to be depressed to the dotted line position, (Fig. 4), by the operation of the friction clutch member 19, which, having a tendency to prevent sliding of the rod 18 through it, will cause the arm 14 to

turn upon its pivot 15. The continued advance of the slide 11 will cause the pusher end 16 of the arm 14 to engage the nearest box of the series or row of boxes on the conveyer belt, and its continued advance will push the row of boxes off of the belt and onto a suitable chute or conveyer 35 down which they may slide by gravity. After the row of boxes has been pushed off of the conveyer belt, the return movement of the slide 11 and with it of the arm 14 commences. The initial portion of this return movement will, by reason of the action of the friction clutch member 19 upon the rod 18, cause the arm 14 to be raised to the dotted line position, Fig. 3, which position will be retained by the arm throughout the remainder of its return movement, and until it again moves forward to transfer or discharge another row of boxes, as hereinbefore described.

Obviously, the stop member or abutment 9, being arranged transversely of the belt will arrest the travel of the boxes of matches therewith in transverse alinement and in proper position to be transferred or discharged from the belt by the pusher end 16 of the arm 14. Obviously, therefore, the arm 14 must be raised, as described, upon its return stroke in order to clear a row of boxes abutting against the stop member 9.

It will thus be seen that I provide a very simple but efficient mechanism for transferring uniformly arranged articles from a travelling conveyer or the like to some other apparatus or mechanism.

Various changes are contemplated as within the spirit of the invention and the scope of the following claims.

What I claim is:—

1. The combination with a travelling conveyer adapted to carry a plurality of articles, of a stop member arranged in operative relation to said conveyer and adapted to arrest the travel of said articles in alinement, an oscillatory pusher member reciprocable relatively to said carrier and adapted to push the articles arrested by said stop member off of said carrier, means for imparting reciprocation to said pusher member, and friction controlled means for producing oscillation of said pusher member upon its pivot in response to its reciprocation.

2. The combination with a travelling conveyer adapted to carry a plurality of articles, of a stop member arranged transversely of said conveyer and adapted to arrest the travel of said articles in alinement, a pivoted pusher member reciprocable transversely of said carrier and adapted to push the articles arrested by said stop member off of said carrier, means for imparting reciprocation to said pusher member, a lever extension on said pusher member, and means for produc-

ing oscillation of said pusher member upon its pivot including a friction clutch member and a slidable connection between said lever extension and said clutch member, whereby  
5 said pusher member will be raised and lowered relatively to said conveyer in response to its reciprocation.

3. The combination with a travelling conveyer adapted to carry a plurality of articles, of a stop member arranged transversely of said conveyer and adapted to arrest the travel of said articles in alinement, a pivoted pusher member reciprocable transversely of said carrier and adapted to push  
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the articles arrested by said stop member off 15  
of said carrier, means for imparting reciprocation to said pusher member, a lever extension on said pusher member, and means for producing oscillation of said pusher member upon its pivot in response to its reciprocation including a fixed friction clutch member and a rod connected with said lever extension and slidable through said clutch member but subject to the clutching action thereof. 20

In testimony whereof I have hereunto set my hand this 9th day of March A. D. 1925. 25

ORLO E. SWARTZ.