Jan. 22, 1924. 1,481,494

H. L. WOOD

ENVELOPE FEEDER FOR TYPEWRITER MACHINES

Filed Dec. 5, 1921 5 Sheets-Sheet 1

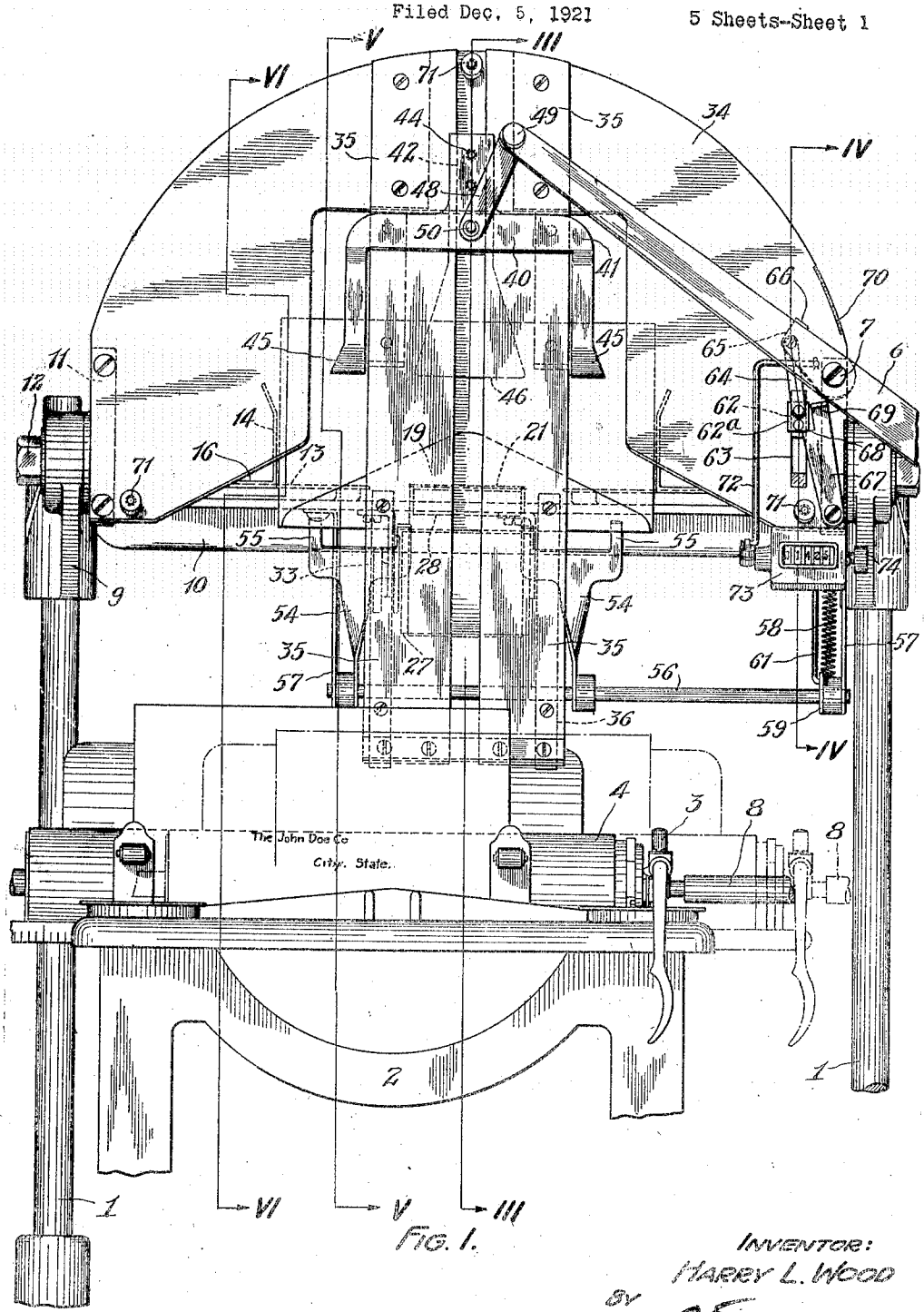


FIG. 1.

INVENTOR:
HARRY L. WOOD
BY
A. E. Emerson,
ATTORNEY.

Jan. 22 , 1924. 1,481,494

H. L. WOOD

ENVELOPE FEEDER FOR TYPEWRITER MACHINES

Filed Dec. 5, 1921 5 Sheets-Sheet 2

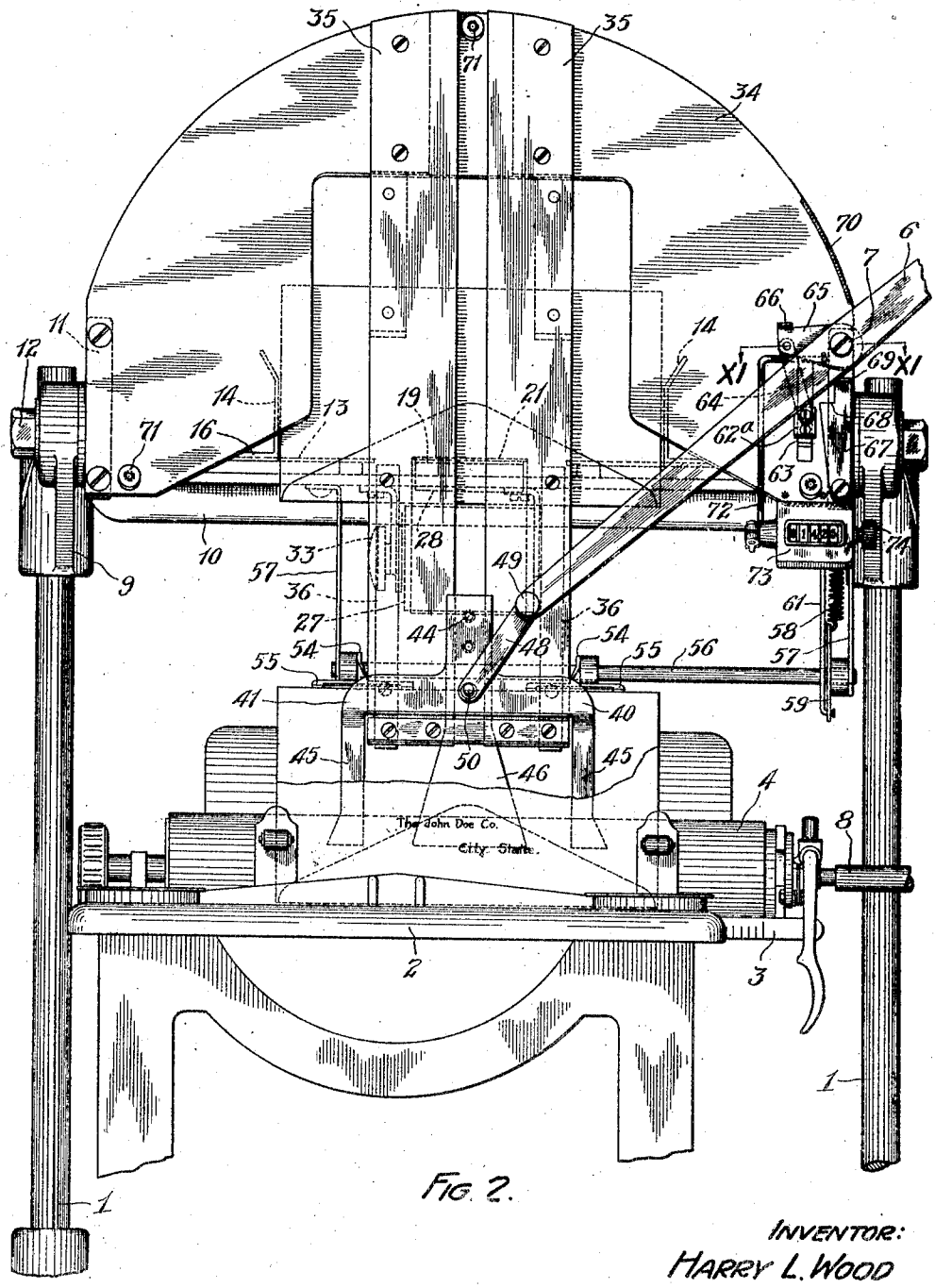


FIG. 2.

INVENTOR:
HARRY L. WOOD

By O. E. Merkel,
ATTORNEY.

Jan. 22, 1924. 1,481,494

H. L. WOOD

ENVELOPE FEEDER FOR TYPEWRITER MACHINES

Filed Dec. 5, 1921 5 Sheets-Sheet 3

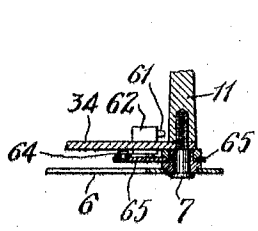


FIG. 11.

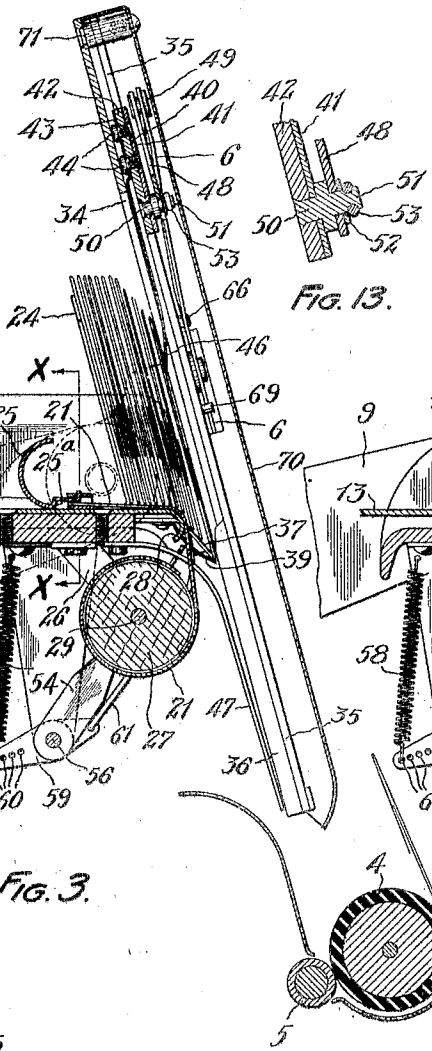


FIG. 3.

FIG. 13.

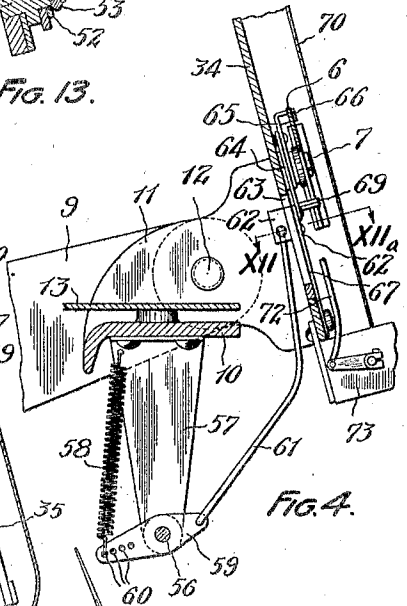


FIG. 4.

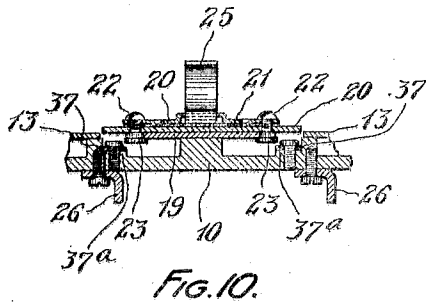


FIG. 10.

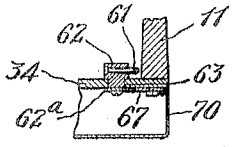


FIG. 12.

INVENTOR:
HARRY L. WOOD
BY
A. E. Merkel,
ATTORNEY.

Jan. 22, 1924. 1,481,494

H. L. WOOD

ENVELOPE FEEDER FOR TYPEWRITER MACHINES

Filed Dec. 5, 1921 5 Sheets-Sheet 4

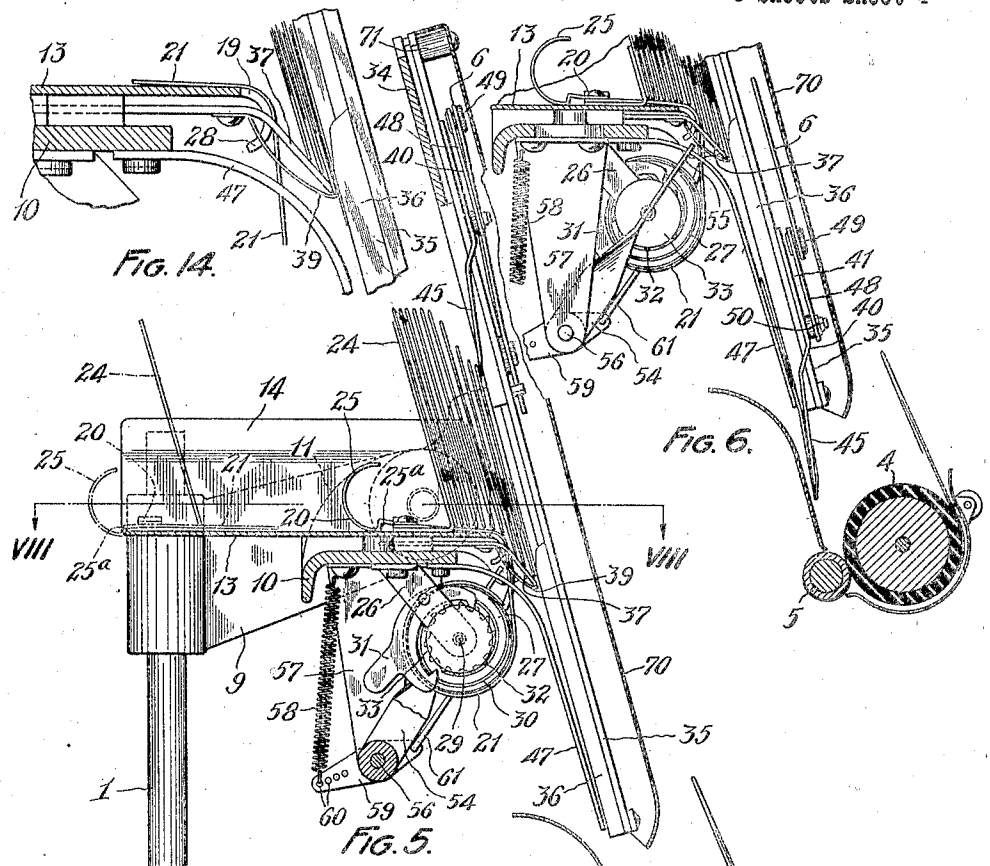


FIG. 14.

FIG. 6.

FIG. 5.

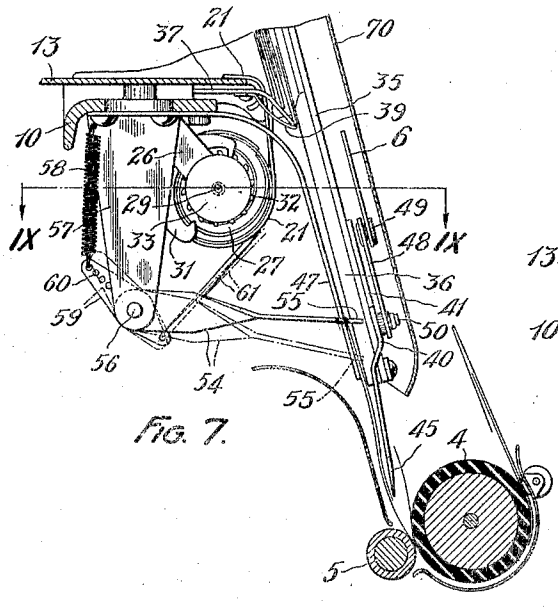


FIG. 7.

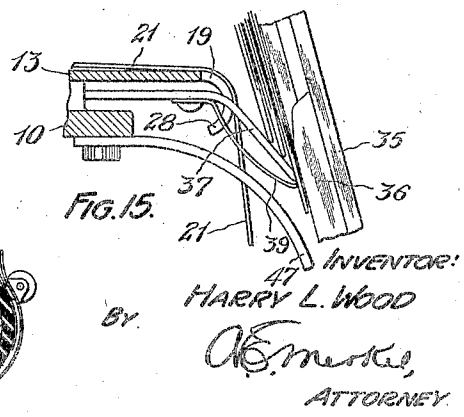


FIG. 15.

INVENTOR:
HARRY L. WOOD
BY
ATTORNEY

Jan. 22, 1924. 1,481,494

H. L. WOOD

ENVELOPE FEEDER FOR TYPEWRITER MACHINES

Filed Dec. 5, 1921 5 Sheets-Sheet 5

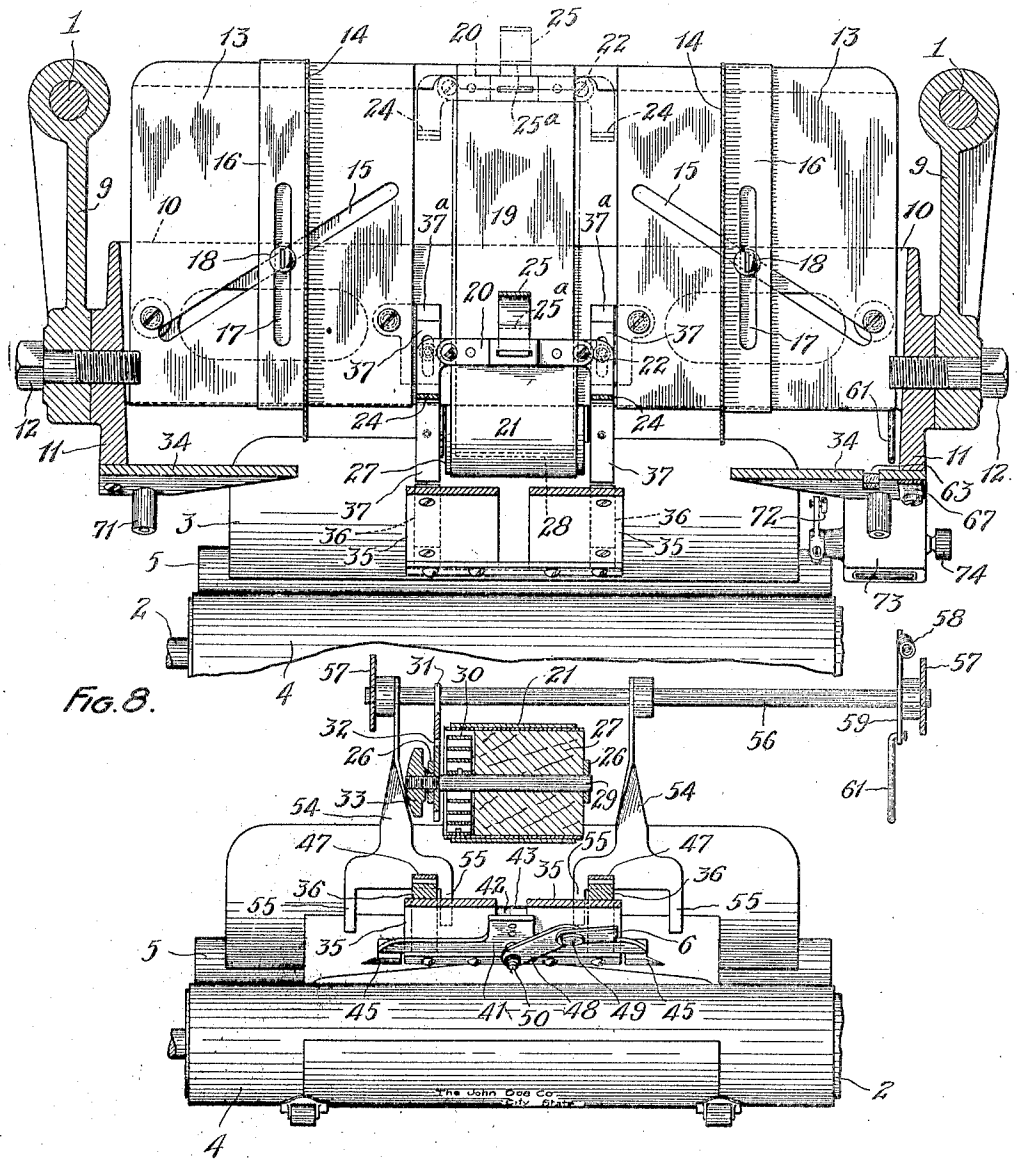


FIG. 8.

FIG. 9.

INVENTOR:
HARRY L. WOOD
BY
ATTORNEY.

Patented Jan. 22, 1924. 1,481,494

UNITED STATES PATENT OFFICE.

HARRY L. WOOD, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN SPEED-O-FEEDER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

ENVELOPE FEEDER FOR TYPEWRITER MACHINES.

Application filed December 5, 1921. Serial No. 519,874.

To all whom it may concern:

Be it known that I, HARRY L. WOOD, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented new and useful Improvements in Envelope Feeders for Typewriter Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

This invention relates to sheet feeding apparatus, particularly to feeding apparatus of the type used for feeding envelopes to typewriting machines, such as shown in the copending application of George T. Trundle, Jr., Serial No. 438,911, filed Jan. 21, 1921.

One object of the present invention is to provide a feeder which is noisless in operation. A further object is to insure the maintenance of proper alinement of the envelopes or other work sheets as they are fed between the feed rolls of the typewriter. A further object is to render certain the proper feeding of envelopes one at a time from the magazine. Other objects will be apparent from the following description and the accompanying drawings.

The annexed drawings and following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of the various mechanical forms in which the principle of the invention may be employed.

In said annexed drawings:

Fig. 1 is a front elevation of the feeding device showing the primary feeder at its upper limit of movement.

Fig. 2 is a view similar to Fig. 1 showing the primary feeder at its lower limit of movement and the envelope being pushed between the feed rolls of the typewriter carriage by the auxiliary feed device.

Fig. 3 is a central vertical section taken on line III—III of Fig. 1.

Fig. 4 is a sectional view taken on line IV—IV of Fig. 1.

Fig. 5 is a sectional view taken on line V—V of Fig. 1.

Fig. 6 is a sectional view taken on line VI—VI of Fig. 1 showing the positions of the primary and auxiliary feed devices just prior to the release of the secondary feed device.

Fig. 7 is a view similar to Fig. 6 showing the auxiliary feed device engaging the rear edge of an envelope and pushing it between the carriage feed rolls.

Fig. 8 is a horizontal section taken on the line VIII—VIII of Fig. 5, looking downwardly as indicated by the arrows.

Fig. 9 is a horizontal section taken on the line IX—IX of Fig. 7, looking downwardly as indicated by the arrows.

Fig. 10 is a sectional detail view on line X—X of Fig. 3 showing the mounting of the follower.

Fig. 11 is a sectional detail view on line XI—XI of Fig. 2.

Fig. 12 is a sectional detail view on line XII—XII of Fig. 4.

Fig. 13 is a sectional detail view showing the detachable connection between the feeder slide and the connecting link.

Figs. 14 and 15 are enlarged sectional detail views of the discharge end of the magazine showing thin and thick envelopes, respectively, being fed from the magazine.

In the accompanying drawings the preferred form of the invention is shown in which the device is adapted for feeding envelopes, but it is to be understood that the invention is not limited to such use, since it is obvious that cards or other work sheets could be fed by modifying the construction of the engaging fingers on the primary feeder, as well understood in the art, an example of such modification being shown in the patent to Langley No. 1,196,706, August 29, 1916.

As shown in Figs. 1, 2, 3, 5 and 8 the feeding mechanism is supported upon stationary posts 1 at the rear of a typewriter 2 which is provided with the usual carriage 3 having a platen roller 4 and a co-operating feed roller 5.

The feeding mechanism is operated by a lever 6 mounted on a pivot 7. The typewriter carriage has connected thereto a retracting and platen actuating rod 8. The outer ends of the lever 6 and rod 8 are connected for simultaneous operation with a mechanism (not shown) at one side of the

typewriter which returns the carriage to position directly beneath the magazine operates the lever 6 to feed an envelope to the rolls 4 and 5 and rotates the platen roller 4 to bring the envelope into proper position to have the address printed thereon as indicated in Fig. 1.

The mechanism above referred to forms no part of the present invention but is shown and described in application Serial No. 438,911 above referred to.

As shown in Figs. 3, 5 and 8 the standards 1 carry at their upper ends forwardly extending supporting arms 9, to the forward ends of which is secured a transverse supporting bar 10. The bar 10 has upwardly extending flanges 11 which are secured to the arms 9 by means of bolts 12. Secured to bosses on the upper face of the bar 10 adjacent the flanges 11 are magazine bed plates 13. Adjustably connected to the upper faces of the plates 13 are a pair of side guides 14. For adjustably securing the side guides 14 to the bed plate, the bed plate is provided with angularly disposed slots 15, the flanges 16 of the guides 14 are provided with longitudinal slots 17, and bolts 18 are passed through the slots 15 and 17. Secured to bosses on the upper face of the bar 10 at the center thereof, is a central magazine bed plate 19, parallel with and spaced from the inner edges of the bed plates 13. Slidably mounted upon the central bed plate 19 is a follower 20 secured upon the upper face of a broad flat strap 21 somewhat wider than the plate 19. The follower 20 is fastened to the strap 21 and slidably connected to the bed plate 19 by means of bolts 22 having flange nuts 23 engaging opposite edges of the plate 19. The follower 20 is provided with an upwardly extending envelope engaging flange 24 and has attached thereto a finger hook 25 by means of which it can be retracted when it is desired to insert a supply of envelopes in the magazine. The finger hook 25 has a shoulder 25^a on its under side adapted to engage the rear edge of the plate 19 to hold the follower in retracted position while a supply of envelopes is being placed in the magazine.

Suspended from the cross bar 10 by means of brackets 26 is a roller 27. The strap 21 passes downwardly over the rolled over forward edge 28 of the plate 19 and is secured to the roller 27. The roller 27 is rotatably mounted upon a shaft 29 and has attached thereto the outer end of a flat coil spring 30, the inner end of which is secured to the shaft 29. The spring 30 tends to rotate the drum in a direction to wind up the strap 21 thereon, causing the follower 20 to exert pressure upon the envelopes in the magazine. The shaft 29 is normally held against rotation by means of a pawl 31 engaging a ratchet 32 fixed to one end of the shaft. The shaft 29 has a knob 33 at one end by means of which the shaft can be rotated to vary the tension of the spring 30.

Fastened to the forward edges of the flanges 11 of the cross bar 10 is a feeder supporting plate 34. Fastened to the front face of the supporting plate 34 adjacent the center thereof are a pair of parallel downwardly extending feeder guide plates 35. The plates 35 extend downwardly in front of the magazine bed plates and have attached to the inner faces thereof guide strips 36 extending from the magazine downwardly to the lower ends of the plates 35. Adjustably secured to bosses 37^a on the upper face of the bar 10 are downwardly inclined envelope supporting rails 37 terminating adjacent the guide strips 36 and spaced a sufficient distance from the guide strips 36 to permit the passage of a single relatively thick envelope. When thinner envelopes are being fed it has been found that occasionally a second envelope will be carried out of the magazine with the one engaged by the feeder. To positively prevent the passage of two envelopes at a time I have provided a spring drag finger 39 beneath each of the rails 37 and projecting slightly beyond the edge thereof. As shown in Fig. 14 the drag fingers 39 brush over the inner surface of the envelope engaged by the feeder and retain in the magazine the second envelope which might otherwise be carried out of the magazine with the outer envelope which is engaged by the feeder. The primary feeding member 40 is slidably mounted on the guide plates 35. The feeding-member 40 comprises an outer plate 41 which slides upon the outer face of the plates 35, a spacing block 42 which fits between the plates 35 and an inner plate 43 which slides upon the inner face of the guide plates 35. The plates 41 and 43 and block 42 are secured together by means of screws 44. The outer plate 41 extends across the plates 35 and terminates in inwardly bent downwardly extending fingers 45 adapted to engage behind the flap of the forward envelope in the magazine. The inner plate 43 terminates at its lower end in a widened inwardly bent flap engaging finger 46 the lower edge of which is in alinement with the lower edges of the fingers 45. The fingers 45 and 46 are of spring steel sufficiently flexible to permit the necessary yielding in the return movement over the front envelope in the magazine.

Opposite and at the rear of each of the guide strips 36 is a spring guide strip 47 secured to the under side of the cross bar 10 and curved downwardly toward the strip 36 and having a portion extending along the strip 36 and forming with the strips 36 a gradually converging passage for the envelopes. The purpose of the spring strips

47 is to yieldingly grip the envelopes as they are fed forward by the feeder 40 to prevent the envelopes from shooting ahead of the feeder in their travel from the magazine to the typewriter feed rolls.

The primary feeding member 40 is connected with the actuating lever 6 through a link 48 which is connected to the lever 6 by an ordinary pivot pin 49 and to the feeder member 40 by means of a pin 50 riveted to the spacing block 42 and plate 41 and having a projecting end 51 adapted to receive the link 48, a retaining washer 52 and a removable split retaining ring 53 above the washer.

It is not desirable to have the feed fingers 45 and 46 engage the rolls 4 and 5. Therefore the extreme lower position of the fingers 45 and 46 is somewhat above the bight of the rollers 4 and 5. To advance the envelopes into engagement with the rollers and to exert pressure on the envelopes to cause them to enter between the rolls, I provide an auxiliary feed device. The auxiliary feed device comprises a pair of envelope engaging arms 54, each having a pair of envelope engaging fingers 55; a shaft 56, to which the arms 54 are fixed, and which is journaled in depending brackets 57 secured to the cross bar 10; and an actuating spring 58 having its upper end secured to the adjacent brackets 57 and its lower end secured in one of the holes 60 in an arm 59 fixed to the shaft 56. By means of the holes 60 the spring 58 can be adjusted to vary the pressure of the arms 54 on the envelopes. Pivotally secured to the arm 59 on the side of the shaft 56 opposite the spring 58 is a retaining and retracting rod 61. The upper end of the rod 61 is pivotally secured to the inner portion of a block 62 mounted to slide in a slot 63 in the supporting plate 34, and removably held in place by a detachable plate 62 sliding on the outer face of the plate 34. Outside the plate 34 the block 62 is connected for actuation in one direction by the lever 6 by means of short links 64 and 65. The link 64 is pivoted to the block 62 at its lower end and to the outer end of the link 65 at its opposite end. The link 65 is pivotally mounted on the pivot pin 7 of the operating lever 6 inside the lever 6 and has an outwardly projecting lip 66 at its outer end adapted to be engaged by the lever 6 in its upward movement. A detent 67 pivoted at its lower end and engageable for movement in both directions by the lever 6, has a notch 68 adapted to engage the plate 62^a and retain the block 62 at the upper end of the slot 63, and an outwardly extending lip 69 projecting into the path of movement of the actuating lever 6. A cover plate 70 is secured to studs 71 carried by the supporting plate 34. The cover plate 70 also limits the outward swinging movement of the detent 67 as shown in Figs 2 and 12.

Pivoted to the lever 6 adjacent the pivot 7 is a rod 72 connected at its lower end to the detent of a counting mechanism 73 which is adapted to be set to zero position at any time by means of the knob 74. By means of the counter 73 the number of envelopes fed by the machine may be counted for each run, so that the number of envelopes addressed by an operator is indicated and a check on the address lists is provided.

In operation a stack of envelopes is placed in the magazine with their flap edges down and the flaps to the front. The envelopes can be readily placed in the magazine when the follower 20 has been retracted by means of the finger hook 25. On release of the follower 20 it will be pulled forward by the spring drum 27 pressing the stack of envelopes against the plate 34. The initial position of the parts is shown in Figs. 1, 3 and 5, in which the primary feeder 40 is shown in its uppermost position with the fingers 45 and 46 in contact with the body of the front envelope in the magazine above the flap and the auxiliary feeder arms 54 are held in elevated position clear of the guideway leading from the magazine. The arms 54 are held elevated against the tension of the spring 58 by means of the detent 67, the notch 68 of which is engaged with the slide block 62 holding the block 62 at the upper end of the slot 63.

When it is desired to feed an envelope from the magazine to the typewriter carriage the lever is swung about its pivot 7 to depress the primary feeder 40. The fingers 45 and 46 slide down the face of the forward envelope, enter behind the flap thereof and push said envelope out of the magazine between the ends of the supporting rails 37 and the guide strips 36. The spring drag fingers 39 brush over the back of said envelope during its movement past the ends of the rails 37 and prevent a second envelope from being carried out with the first and also provide sufficient resistance to the passage of the first envelope to maintain positive engagement of the fingers 45 and 46 inside the flap. On further movement of the feeder but before the envelope has passed out of engagement with the drag fingers 39 the body of the envelope is gripped by the spring fingers 47 which supply sufficient frictional drag on the envelope to prevent the envelope from falling away from the fingers 45 and 46. As the primary feeder 40 approaches its lower limit of movement as shown in Fig. 2, the lower edge of the lever 6 strikes the lip 69 of the detent 67 and brushes said detent out of engagement with the slide block 62. This frees the rod 61 permitting free downward movement of

the slide 62 in the slot 63, whereupon the shaft 56 is actuated by the spring 58 to swing the arms 54 forwardly until the fingers 55 of the spring 54 engage the upper edge of the envelope as shown in Figs. 2 and 7. It should be noted that the arms 54 are provided with spaced engaging fingers 55. This arrangement enables the auxiliary feeder to properly engage envelopes of different sizes. It should also be noted that the fingers 55 straddle the guide strips 36 and 47 between which the body of the envelope is gripped. The rear edge of the envelope is thus effectively held against buckling under the pressure of the fingers 55 and this enables the fingers 55 to exert an effective end thrust on the envelope to force it between the feed rollers 4 and 5. As clearly shown in Fig. 2 the links 64 and 65 are so proportioned that the lip 66 on the link 65 is not engaged by lever 6 until the feeder 40 has moved upwardly a considerable distance. It is during this return movement of the feeder 40 that the feed rollers 4 and 5 of the typewriter carriage are rotated and the auxiliary feeder arms 54 are thus permitted to continue their pressure on the envelope for sufficient time to insure their being gripped by the carriage feed rolls 4 and 5. As the arm 6 approaches its upper limit of movement the lip 66 on the link 65 is engaged by the upper edge of the lever 6 and the slide 62 is pulled to the upper end of the slot 63 raising the rod 61 and turning the shaft 56 against the tension of the spring 58 and raising the arms 54 clear of the envelope guideway. When the slide 62 reaches the upper end of the slot 63 the detent 67 is pushed into locking position by engagement of the lever 6 with the lip 67 as indicated in Fig. 1.

The inclined extension rails 37 at the discharge end of the magazine co-operate with primary feeder 40 to effectively break adhesion between the individual envelopes in the pack, since it causes a break in the pack at the discharge end thereof and the frictional drag of each front envelope as it is pushed from the magazine causes sliding movement between any adhering envelopes positioned over the downwardly inclined discharge portion of the magazine.

It should be noted that there is no direct interengagement between the primary and auxiliary feeders and that the releasing and retracting mechanism is mounted adjacent the pivot of the lever 6. By this arrangement I have eliminated impact between rapidly moving parts, and have produced a machine which is noiseless in operation. By placing the actuating and releasing contact members adjacent the pivot of the lever 6 where the rate of movement of the lever is slow, there is practically no sound produced upon their contact with the lever.

What I claim is:

1. In a work feeding device for typewriting machines, a magazine adapted to receive a stack of work sheets on edge; an upright plate at the front end of said magazine; a primary feeding member reciprocably mounted upon said plate; means for reciprocating said primary feeding member; and a secondary feeding member mounted independently of and behind said plate, said secondary feeding member being controlled by said primary feeding member.

2. The combination with the feed rolls of a typewriter carriage; of a feeder therefor comprising: a magazine adapted to receive a stack of work sheets on edge; an upright plate at the front end of said magazine; a primary feeding member reciprocably mounted upon said plate adapted to feed the forward sheet from said stack to a position adjacent said rolls, and a secondary feeding member mounted independently of and behind said plate and beneath the magazine, and engageable with said sheet upon completion of the forward movement of said primary feeding member to press said sheet into the bight of said rolls.

3. In a work feeding device for typewriting machines, a magazine adapted to receive a stack of envelopes; a guideway leading downwardly from said magazine; a feeder for moving envelopes one at a time from said magazine into said guideway; means at the lower end of said guideway for frictionally engaging each envelope to maintain it in engagement with said feeder during the forward movement thereof; and an auxiliary feeder controlled by the primary feeder and engageable with each envelope to prevent backward movement thereof upon the return movement of the primary feeder.

4. In a work feeder for typwriting machines, a magazine for envelopes; a primary feeder reciprocating across the front of said magazine to feed envelopes downwardly therefrom and engageable with the flaps of said envelopes; an auxiliary pusher engageable with the upper edges of said envelopes when the primary feeder has completed its downward stroke and means for yieldably gripping the body of said envelope beneath said auxiliary pusher and beneath the magazine.

5. In a work feeder for typwriting machines, a magazine for work sheets; a plate extending across the front of said magazine; a primary feeder reciprocably mounted on said plate, guide strips on said plate beneath said magazine; and spring guide strips opposed to said first mentioned strips.

6. In a work feeder for typewriting machines, a magazine for work sheets, a primary feeder reciprocably mounted in front of said magazine and adapted to engage said sheets one at a time; spring actuated pusher arms

pivotally mounted beneath said magazine; means for normally holding said arms in inoperative position; and means controlled by said primary feeder to release said arms.

7. A feeder for envelopes comprising, a magazine adapted to receive a stack of envelopes on edge with their flaps extending forwardly; a reciprocating feeder engageable with the flaps of said envelopes, guide strips engageable with the flap side of said envelopes, and spring strips opposed to said guide strips adapted to press against the opposite side of said envelopes; and an auxiliary spring actuated pusher having fingers adapted to straddle said strips.

8. The combination with the feed rolls of a typewriter carriage; of a feeder for envelopes comprising a magazine above said carriage; a plate positioned in front of said magazine; a reciprocating feeder mounted on said plate, and engageable with the flaps of said envelopes to feed them from the magazine; an auxiliary pusher engageable with the rear edges of said envelopes to push them into the bight of said rolls; and envelope gripping guides beneath said auxiliary pusher.

9. In a work feeder for typewriting machines, a magazine for work sheets, a primary feeder mounted to vibrate relatively to said magazine whereby to feed the work sheets in sequence therefrom, a secondary feeder movably mounted and having its point of support remote from said primary feeder and with its operative end in close proximity to said primary feeder whereby to deliver the work sheets from the primary feeder to the typewriter rolls, and connections between said primary and secondary feeders for controlling the movement of the secondary feeder and its restoration to initial position by the movement of said primary feeder.

10. A magazine for a work feeder comprising a supporting bed; side guides; a follower mounted between the guides; a strap secured to said follower, extending forwardly therefrom and resting on said bed; and a spring drum beneath said bed to which the forward end of said strap is secured.

11. A feeder for work sheets comprising a magazine having a horizontal bed for receiving a stack of work sheets; an upright plate in front of said magazine; a reciprocating feeder mounted on said plate and engageable with the foremost sheet in said magazine; and means for pressing said stack of sheets toward said plate, said bed having a downwardly inclined portion at its end adjacent said plate whereby the individual sheets are caused to slide one with respect to the other prior to their engagement with said feeder.

12. A feeder for work sheets comprising, a magazine having a horizontal bed with a downwardly inclined forward end portion; a reciprocating feeder mounted in front of said magazine; guide members spaced a slight distance from the forward end of said bed; and spring fingers beneath said inclined portion and extending beyond the forward edge thereof.

13. In an envelope feeder, a magazine adapted to hold a stack of envelopes on edge with their flaps extending forwardly; a feeder having fingers adapted to engage inside the flaps of said envelopes to remove them from the magazine, a guide member spaced from the forward edge of the magazine to provide a slot through which the envelopes may be pushed by said feeder; and a spring finger beneath said magazine projecting into said slot.

14. In an enevelope feeder, a magazine adapted to receive a stack of envelopes; an upright plate arranged in front of said magazine and having a guideway for envelopes on the inner side thereof; a reciprocating feeder having fingers projecting through slots in said plate mounted for reciprocation on said plate; a shaft beneath said magazine and behind said plate; an envelope engaging arm carried by said shaft; a spring connected to said shaft and normally tending to move said arms toward said plate; and releasable means normally holding said arms in raised position clear of said guideway, said holding means being controlled by said feeding means.

15. In an envelope feeder, a magazine adapted to receive a stack of envelopes; a primary feeder mounted for reciprocation across the front end of said magazine; a pivoted lever for actuating said feeder; a secondary feeder comprising a pair of arms fixed to a shaft, and a spring for imparting rotary movement to said shaft; means for restraining said shaft against rotation said restraining means being engageable by said lever to release said shaft; and means engageable with said lever to return said shaft to its original position.

16. The combination with the feed rolls of a typewriter carriage; of a magazine for envelopes supported above said carriage; a guideway leading downwardly from said magazine; a primary feeder adapted to feed sheets one by one from the magazine into the guideway; means at the lower end of the guideway for gripping the body of the sheets; and an auxiliary feeder adapted to engage said sheets above said gripping means and push them into the bight of said rolls.

17. In an envelope feeding device for typewriting machines, a magazine for envelopes; a reciprocating feeder mounted at the forward end of said magazine; a pivoted lever for actuating said feeder; an auxiliary feeder; a spring for actuating said auxiliary feeder in a forward direction; means

engageable with said lever adjacent the pivot thereof for retracting said auxiliary feeder; and means controlled by said lever for retaining said auxiliary feeder in retracted position.

18. In an envelope feeding device for typewriting machines, a magazine for envelopes; a reciprocating feeder mounted at the forward end of said magazine; a pivoted lever for actuating said feeder; an auxiliary feeder; a spring for actuating said feeder in a forward direction; means actuated by said lever for retracting said auxiliary feeder, and a detent for retaining said feeder in retracted position, said detent being engageable with said lever for movement into and out of operative position.

19. A feeder for work sheets comprising, a magazine adapted to support a pack of sheets; a feeder mounted at the discharge end of said magazine adapted to deliver sheets one at a time from said magazine, said magazine having a portion at its discharge end offset toward the discharge side thereof whereby said pack is broken adjacent the discharge end.

20. The combination with the feed rolls of a typewriter carriage; of a magazine for envelopes supported above said carriage and independently of said carriage; means for retracting said carriage; and means connected with said retracting means for positively engaging and feeding an envelope from said magazine to said feed rolls, said envelope feeding means being noiseless in operation.

Signed by me this 11th day of November, 1921.

HARRY L. WOOD.