

Oct. 18, 1932.

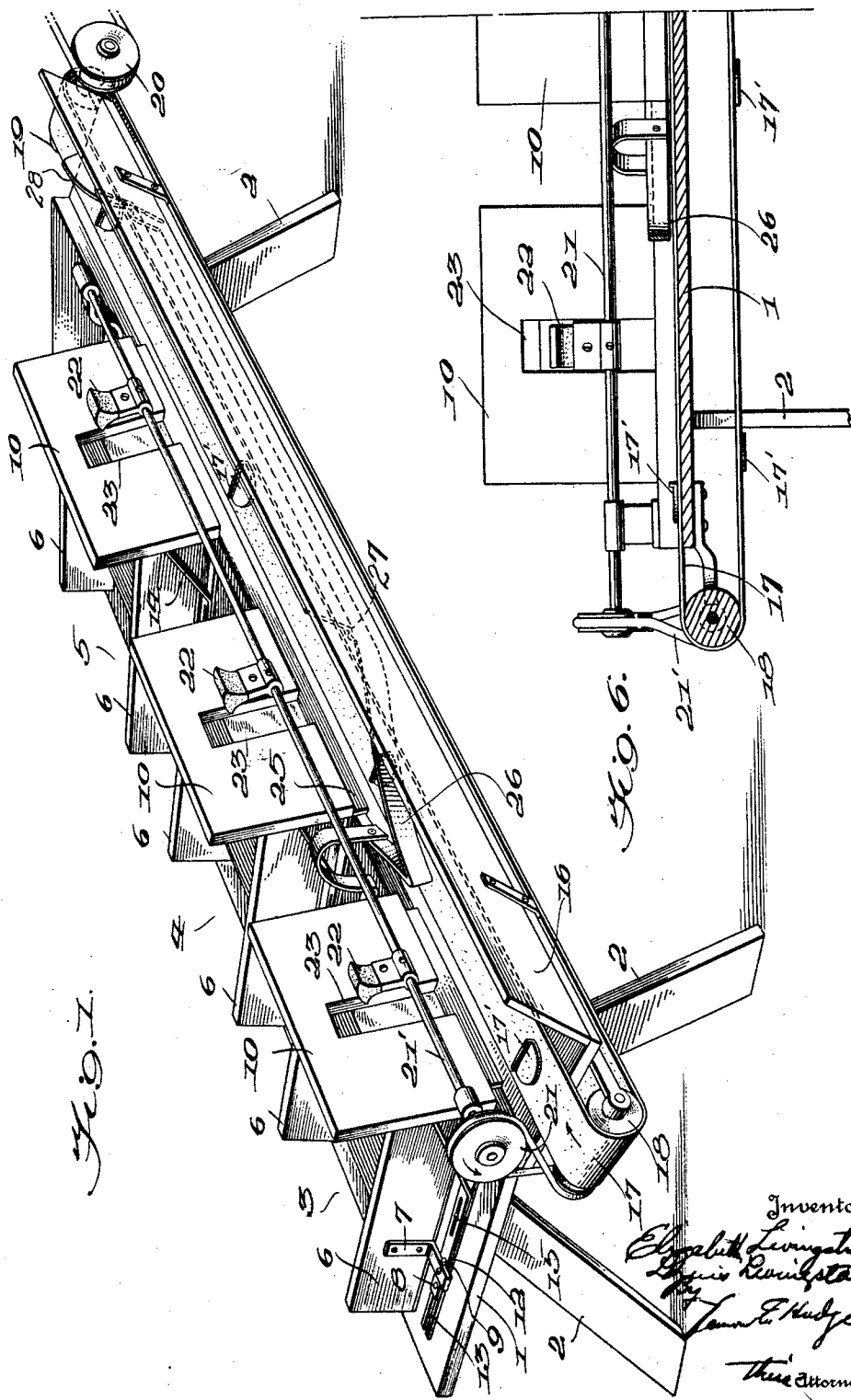
E. LIVINGSTON ET AL

1,883,307

ASSEMBLING MACHINE

Filed Dec. 18, 1929

4 Sheets-Sheet 1



Oct. 18, 1932.

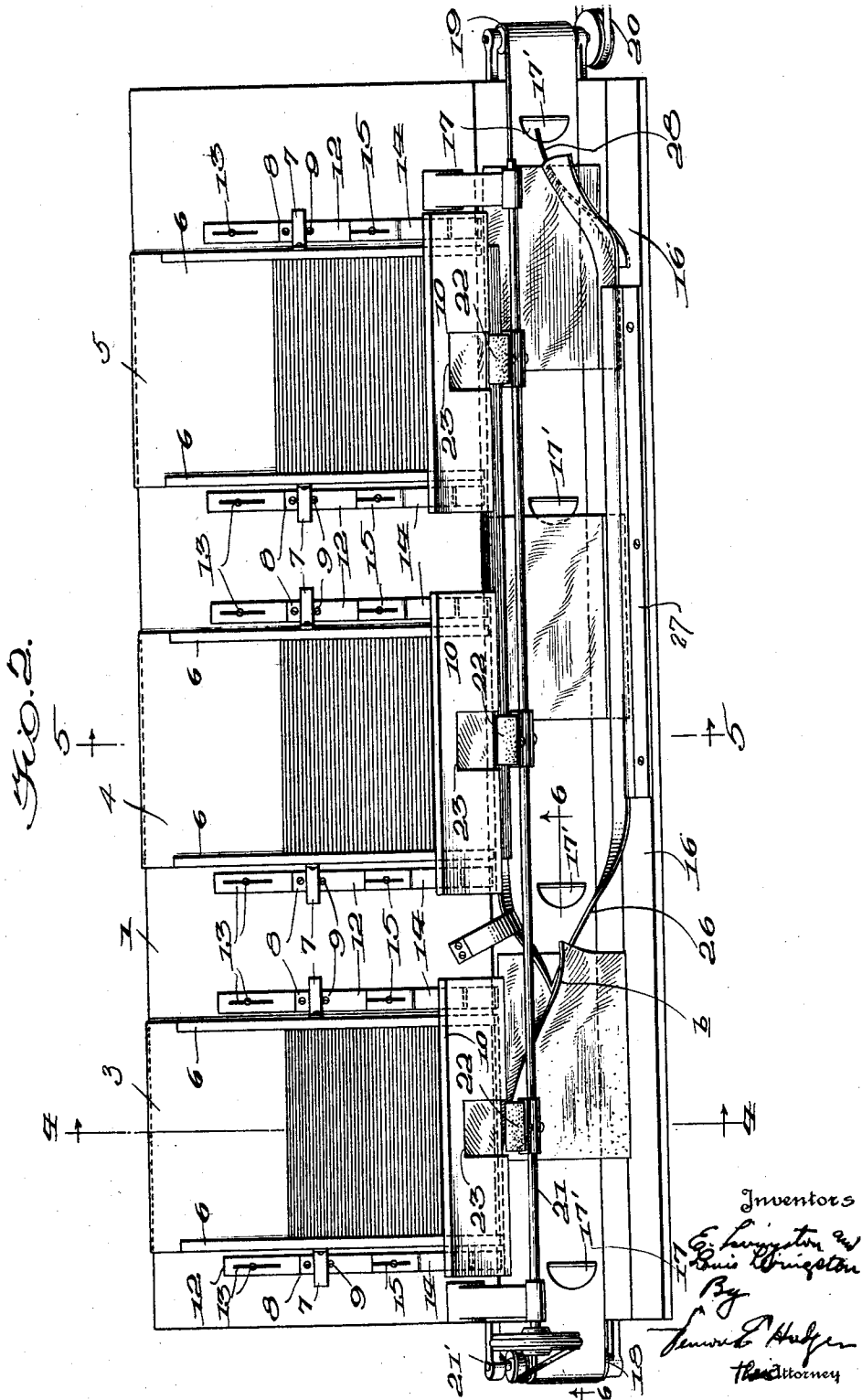
E. LIVINGSTON ET AL

1,883,307

ASSEMBLING MACHINE

Filed Dec. 18, 1929

4 Sheets-Sheet 2



Oct. 18, 1932.

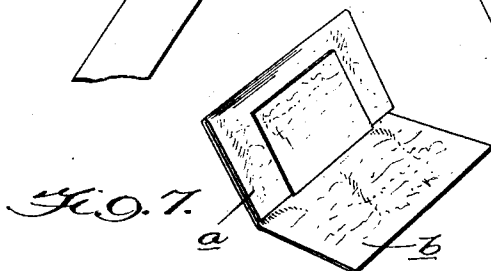
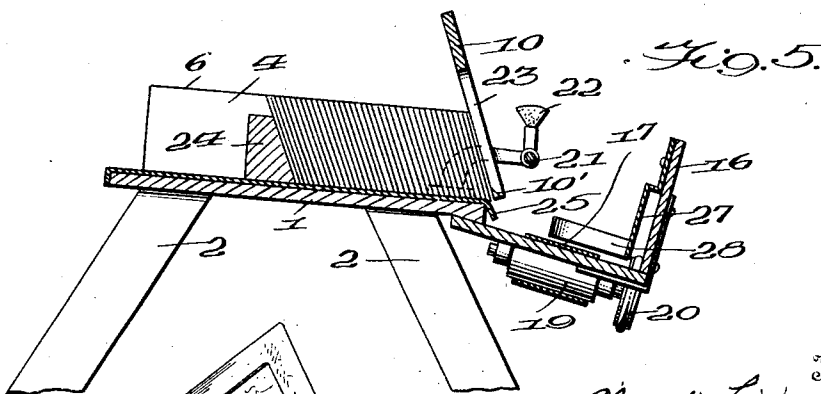
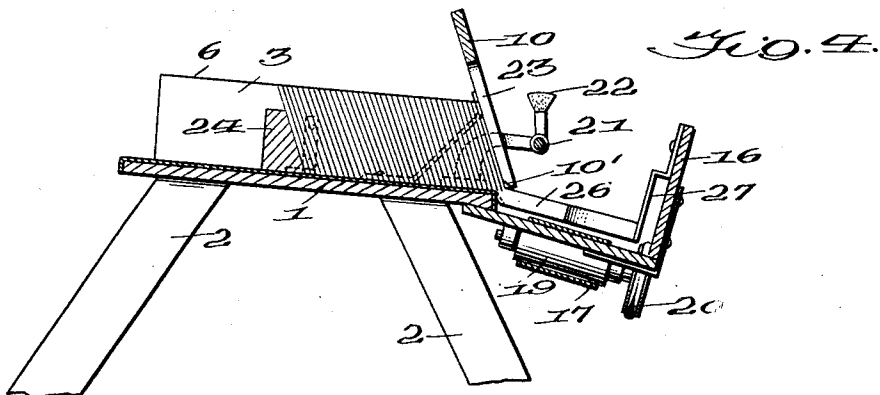
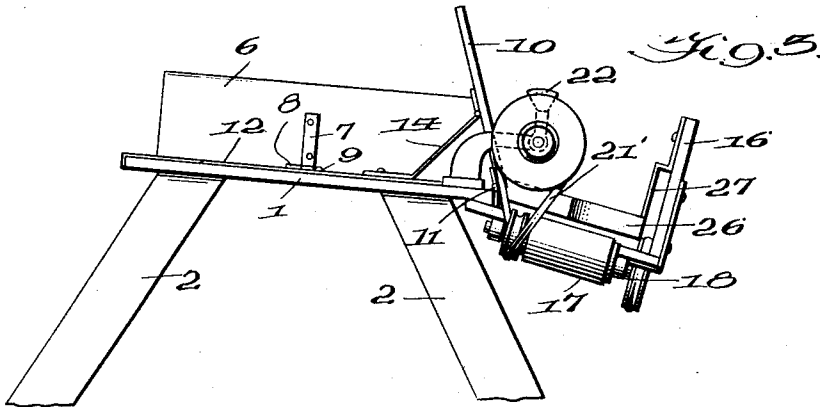
E. LIVINGSTON ET AL

1,883,307

ASSEMBLING MACHINE

Filed Dec. 18, 1929

4 Sheets-Sheet 3



Inventors
Elizabeth Livingston and
Lynne Livingston
Harold E. Hodge
Attorney

Oct. 18, 1932.

E. LIVINGSTON ET AL

1,883,307

ASSEMBLING MACHINE

Filed Dec. 18, 1929

4 Sheets-Sheet 4

Fig. 8.

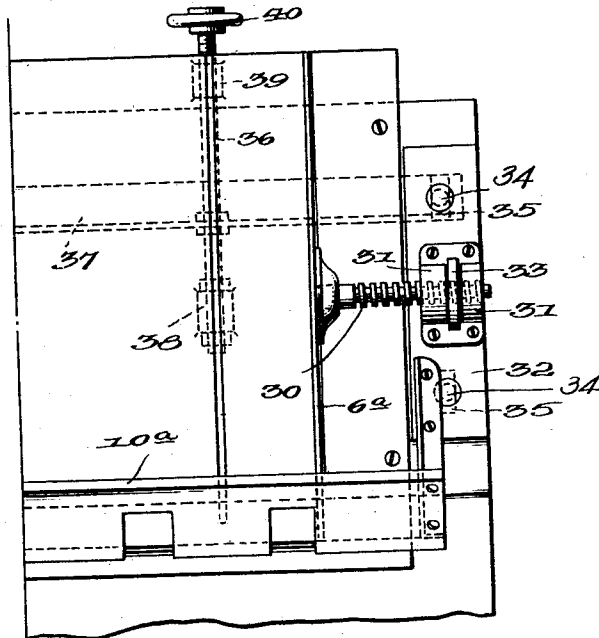


Fig. 9.

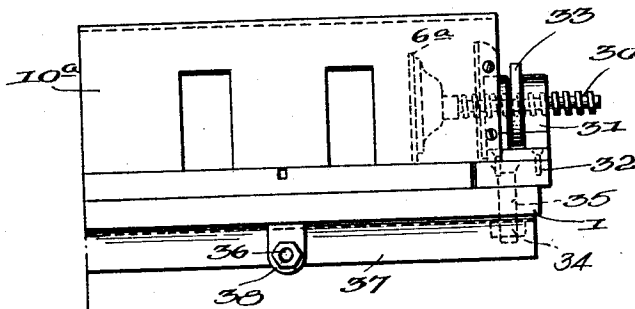
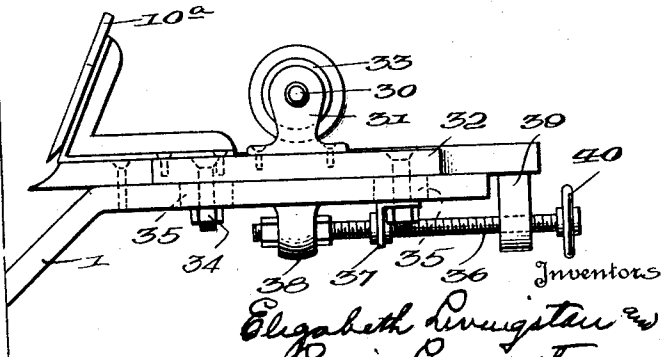


Fig. 10.



Inventors
Elizabeth Livingston
Louis Livingston
Vernon E. Hodges
Attorney

UNITED STATES PATENT OFFICE

ELIZABETH LIVINGSTON AND LOUIS LIVINGSTON, OF WASHINGTON, DISTRICT OF COLUMBIA

ASSEMBLING MACHINE

Application filed December 18, 1929. Serial No. 415,054.

This invention relates to an improvement in assembling machines.

Our invention has to do with the assembling of independent elements, such as papers, cards, and the like, and may be used for assembling only, or for successively inserting the enclosures in a letter, circular, folder or the like.

The invention relates more particularly to machines for automatically assembling all enclosures, such as folders, descriptive circulars, cards, leaflets, return envelopes, etc., and to insert them into business letters by first partly unfolding the letters, in the event that they have been folded, dropping the inserts therein, and then again folding up the complete letter to enclose the inserts.

Heretofore, this has been accomplished primarily by hand, and it is the purpose of this machine to eliminate or substantially reduce manual labor for accomplishing this result and to provide a machine for this purpose.

In the accompanying drawings:

Fig. 1 is a perspective view showing the form of the machine;

Fig. 2 is a top plan view thereof;

Fig. 3 is an end view of the machine;

Fig. 4 is a transverse section on the line 4—4 of Fig. 2;

Fig. 5 is a similar view on the line 5—5;

Fig. 6 is a partial longitudinal section on the line 6—6 of Fig. 2;

Fig. 7 is a perspective view of one of the letters with the insert in place therein; and

Figs. 8, 9 and 10 are views in plan, side and end elevation respectively of a slightly varied form of construction.

In the form of the invention shown in the drawings, a suitable table designated by the numeral 1 is provided and is conveniently supported on legs 2. This table 1 is preferably tilted at an angle to a horizontal plane, as shown in Figs. 3, 4 and 5. Compartments 3, 4 and 5 are shown as formed upon the table and arranged transversely thereof, one beside another, as shown in Fig. 1, the first compartment 3 being for the purpose of receiving the folded letters while the next two succeeding compartments 4 and 5 contain the inserts that are to be placed in the letters.

There may be any convenient number of compartments according to the number of inserts desired, and for the purpose of illustrating the invention only two insert-compartments are shown, although more or less of these may be used as required.

Each of the compartments 3, 4 and 5 is formed of side-plates 6 secured on their outer sides by angle braces 7, which extend between blocks 8 and adjusting screws 9. These screws 9 may be loosened to allow the plates 6 to be adjusted toward or from each other to regulate the width of the compartment, after which the screws may be tightened up to frictionally hold the angle braces 7 in place, which in turn secures the side plates 6 of each compartment.

The forward side of each compartment is provided with a plate 10 which may be hinged as at 11 to strips 12, which extend across the table 1 and may be bodily adjusted and held in an adjusted position by means of a slot and screw designated generally by the numeral 13, as clearly shown in Fig. 2. The strips 12 also carry the blocks 8 and screws 9, which secure the side plates 6 in position so that the entire compartment may be adjusted transversely of the table. The lower back edge of the plate 10 is beveled as at 10' (see Figs. 4 and 5) to facilitate the forcing of the sheets or inserts from the compartments. By adjusting the strips 12 forwardly of the table or transversely thereof, the size of the mouth opening or slot of each compartment may be increased or decreased in order to regulate the movement of the letters or inserts therefrom. The front plate 10 may also have a swinging adjustment in a vertical plane and for this purpose braces 14 are pivotally connected with each plate 10 and are slidably connected with the strips 12, as shown in Figs. 2 and 3, the latter connection being by means of a screw and slot 15.

An angular channel 16 is arranged along one edge of the table 1 and within this channel an endless belt conveyor 17 operates, said conveyor passing over rollers 18 and 19, the latter of which is driven as at 20. Small tabs 17' may be fixed to the conveyor 17 to positively engage the rear edge of the letter sheet

and enclosures to keep them from slipping out of their proper positions and to align the enclosures with the edges of the letter.

Arranged within the channel 16 and parallel therewith is a shaft 21 driven by a belt, chain or gearing 21' from the roller 18. This shaft 21 carries a plurality of rubbers or similar elements 22, each of which is in position to register with a notch 23, one or more of which is formed in each face plate 10 in order to force the letter or insert from the corresponding compartment.

The letters or inserts are held against the backs of the plates 10 by a suitable follower 24 arranged in each compartment, and which presses against the backs of the letters or inserts in the compartments, in order that the friction of the rubbers 22 may force the same therefrom.

Arranged along one side of the channel 16 is a lip 25 which extends part-way of the length of the channel and has connected at its forward end an approximately V-shaped opener 26, the opposite side of which opener is connected with a guide 27 secured to the other side of the channel 16. The guide 27 is turned inward as at 28 at its outer end in order to refold the letter, after receiving the inserts.

The letters are introduced into the compartment 3 in completely folded form while the inserts are respectively stacked in the compartments 4 and 5, or either of these.

The body of the letter is designated in Fig. 7 by the letter *a* while the opening flap is designated by *b*. The flap *b* is folded over the body of the letter in the usual way of folding business letters as these are introduced and placed in the compartment 3. The operation of the belt conveyor 17 serves to rotate the shaft 21, and with it the rubbers 22 which are turned to engage the forwardmost letter and inserts through the notches 23, causing such letter and inserts to be forced beneath the front plates 10 out of the compartments and onto the belt conveyor 17, which, being operated in the direction of the arrow shown in Fig. 1, serves to convey these longitudinally of the machine.

The rubber 22 being made of suitable flexible material, in the course of its movement into and through the notch 23, resiliently engages each letter or insert. The relation between the rubber for the letters and the latter is such that the rubber engages the opening flap *b* as it nears a completion of its downward movement in forcing the letter from its compartment, thus serving to separate the flap *b* from the body *a* of the letter and tending to open these two, as shown in Fig. 2. The flap *b* is thus opened sufficiently to be engaged by the V-shaped opener 26 while the body portion *a* rides on the belt conveyor 17 and the V-shaped guide 26 serves to maintain the portions *a* and *b* of the letter in open re-

lation and guides them respectively beneath the flange 25 and guide 27.

In the course of such movement, as the letter moves beneath the mouth of the compartment 4, the next succeeding rubber 22 has been turned to force an insert from said compartment, which drops into the opened letter and is carried along the conveyor with the letter. This is repeated as the letter and first insert pass the mouth of the compartment 5 if an additional insert is to be used.

After the letter passes in front of the succeeding compartments and receives the inserts designed therefor, the flap *b* engages the inner side of the guide 28, which turns it back over into a closed position with the inserts in the folded letter, and the letter is then delivered from the conveyor 17 to a suitable table or other place where it is inserted into an envelope for mailing.

The construction described while satisfactory for the purposes of illustrating an operative form of our invention is obviously capable of modifications, one of which is illustrated in Figs. 8, 9 and 10, and the construction therein illustrated pertains to another mode of adjustment of the sides plates 6 and the plate 10 illustrated and hitherto described in connection with Figs. 3, 4 and 5.

In the form illustrated in Figs. 8, 9 and 10, the embodied thought is to secure a little greater ease and accuracy as well as precision of adjustment, and by referring to these figures it will be seen that a screw 30 extends from the side plate 6*a*, which latter corresponds to the plate 6 previously described. This screw 30 extends loosely through a pair of upstanding lugs 31 spaced apart and extending upwardly on the adjusting plate 32, and a nut 33 located between the lugs 31 and on the screw 30 is turned on the threads of the screw 30 to adjust the side plates 6*a*, (only one of which is shown) forward or backward.

The adjusting plate 32 is supported on the table 1 of the machine, and carries the plate 10*a* corresponding to plate 10 in the previously-described construction. The adjusting plate 32, as the name implies, is itself adjustable, and, as a simple means for effecting this adjustability, studs 34 extend downwardly through slots 35 in the table 1, and an adjusting screw 36 is threaded through the angle-iron 37 and turns in the lug 38 beneath the table 1, as viewed in Fig. 10. The outer end of the screw 36 is supported in a bearing 39, and a wheel 40 on the outer end of this screw is turned to the right or left as a means of turning the screw forward or backwardly for adjusting the adjusting-plate 32.

From the foregoing, it will be understood that with this adjustment the entire superstructure, including the plates 6*a* and 10*a*, is moved as a unit, whereas the side plate 6*a* is adjustable independently of plate 10*a* when desired.

As many compartments may be employed as there are inserts for the letters, and, it is repeated, that each compartment may be adjusted and regulated to suit the size of the letters and inserts.

It may be desirable at times to assemble inserts only by means of this mechanism without employing letters or circulars at all, and our invention contemplates such a use of the machine.

This machine effectively eliminates the necessity of manually applying inserts to letters by the doing of this automatically and without the necessity of manual labor for the purpose.

We claim:

1. In a machine of the character described, the combination of a support, a plurality of compartments arranged thereon, a conveyor arranged in front of and extending along said compartments, means for feeding a folded letter from one of said compartments onto said conveyor, an approximately V-shaped opener arranged in position to open the flap of the letter, and means for applying an insert to the opened letter.

2. In a machine of the character described, the combination of a support, a plurality of compartments arranged thereon, a conveyor extending along said compartments, means for feeding a folded letter from one of said compartments, an approximately-V-shaped opener for opening the flap of the letter, guides for receiving portions of the letter to hold the same open, means for feeding an insert into the opened letter, and means connected with at least one of the guides for causing a refolding of the letter.

3. An assembling machine including a suitable support, end and side plates located thereon, means for adjusting said plates together as a unit, and means for adjusting at least one of said plates independently of the others.

4. An assembling machine including a suitable support, end and side plates located thereon, means for adjusting said plates together as a unit, and independent means connected with each of the side plates for adjusting them independently of the end plate.

5. In an assembling machine of the character described, the combination of a plurality of compartments, a front plate for closing an end of each of the compartments and having a slot formed therein, a channel extending lengthwise of the machine beneath the slots, means for presenting folded letters or the like to the slot of one of the compartments, means for presenting inserts to the slot of a second compartment, and a shaft extending parallel with the channel and having a plurality of rubbing elements resiliently supported thereby for engaging the letters and inserts to force the same through the slots and into the channel.

6. In an assembling machine of the character described, the combination of a plurality of compartments, a front plate for closing an end of each of the compartments and having a slot formed therein, a channel extending lengthwise of the machine beneath the slots, means for presenting folded letters or the like to the slot of one of the compartments, means for presenting inserts to the slot of a second compartment, a shaft extending parallel with and over the channel and having a plurality of rubbing elements resiliently supported thereby for engaging the letters and inserts to force the same through the slots and into the channel, and a conveyor extending lengthwise of and within the channel for receiving the letters and inserts.

7. In an assembling machine of the character described, the combination of a plurality of compartments, a front plate for closing an end of each of the compartments and having a slot formed therein, a channel extending lengthwise of the machine beneath the slots, means for presenting folded letters or the like to the slot of one of the compartments, means for presenting inserts to the slot of a second compartment, a shaft extending parallel with and over the channel and having a plurality of rubbing elements resiliently supported thereby for engaging the letters and inserts to force the same through the slots and into the channel, a conveyor extending lengthwise of and within the channel for receiving the letters and inserts, an approximately V-shaped opening member adapted to engage the folded letter to open a flap thereof to receive the inserts, and means for refolding said flap of the letter after the inserts are in place.

8. In an assembling machine of the character described, the combination of a table having a plurality of transversely arranged compartments thereon, a front plate for each of said compartments and having a slot therein, a channel extending lengthwise of the table and along a plurality of said compartments, a conveyor operatively disposed within the channel, a rubbing element arranged in front of each of the slots to remove letters and inserts from the compartments, and an approximately V-shaped opener extending transversely across the channel and adapted to open a flap of each of the letters to receive the inserts.

9. In an assembling machine of the character described, the combination of a table having a plurality of transversely arranged compartments thereon, a front plate for each of said compartments and having a slot therein, a channel extending lengthwise of the table and along a plurality of said compartments, a conveyor operatively disposed within the channel, a rubbing element arranged in front of each of the slots to remove letters

and inserts from the compartments, an approximately V-shaped opener extending transversely across the channel and adapted to open a flap of each of the letters to receive the inserts, a shaft resiliently supporting the rubbing elements, and means for refolding the flaps of the letters after the inserts are in place.

10. In an assembling machine, the combination of a compartment having a front plate closing an end thereof, said plate having a slot therein, a channel extending lengthwise of the machine, means for presenting folded letters or the like to the front of the compartment, and a shaft extending approximately parallel with the channel and having a rubbing element arranged for engaging the letters through the slot to force the same into the channel.

11. In an assembling machine, the combination of a compartment having a front plate closing an end thereof, said plate having a slot therein, a channel extending lengthwise of the machine, means for presenting folded letters or the like to the front of the compartment, and a shaft extending parallel with and over the channel and having a resilient rubbing element supported thereby and arranged for engaging the letters through the slot to force the same into the channel.

12. In an assembling machine, the combination of a compartment having a front plate closing an end thereof, said plate having a slot therein, a channel extending lengthwise of the machine, means for presenting folded letters or the like to the front of the compartment, and a shaft extending parallel with and over the channel and having a resilient rubbing element supported thereby and arranged for engaging the letters through the slot to force the same into the channel, and a belt conveyor disposed in the bottom of the channel and conveying the letters therealong.

13. In an assembling machine, the combination of a plurality of compartments, a front plate for closing an end of each of said compartments and having a discharge opening, a channel extending lengthwise of the machine beneath the openings, and a shaft extending approximately parallel with the channel and carrying rubbing elements to force letters and inserts through the openings and into the channel.

14. In an assembling machine, the combination of a plurality of compartments, a front plate for closing an end of each of said compartments and having a discharge opening, a channel extending lengthwise of the machine beneath the openings, means for presenting folded letters and inserts or the like to the openings, and a shaft extending approximately parallel with the channel and carrying a plurality of rubbing elements for engaging the letters and inserts to force the

same through the openings and into the channel.

15. In an assembling machine, the combination of a plurality of compartments, a front plate for closing an end of each of said compartments and having a discharge opening, a channel extending lengthwise of the machine beneath the openings, means for presenting folded letters and inserts or the like to the openings, and a shaft extending approximately parallel with the channel and carrying a plurality of rubbing elements for engaging the letters and inserts to force the same through the openings and into the channel, and a belt conveyor disposed in the bottom of the channel and conveying the letters therealong.

16. In an assembling machine, the combination of a compartment, means for feeding a folded letter or the like from said compartment, a channel arranged to receive the folded letter, and an approximately V-shaped opener extending across the channel in approximately horizontal relation for opening the letter.

17. In an assembling machine, a table, an adjusting plate slidably mounted thereon, means for adjusting the plate relative to the table, one or more side plates carried by the adjusting plate, means for adjusting said side plate relative to the adjusting plate, and an end plate carried by the adjusting plate.

18. In an assembling machine, a table, one or more side plates mounted thereon, forming a compartment, means for adjusting the side plates transversely of the compartment, an end plate for the compartment, and means for adjusting said end plate to provide an adjustable mouth for the compartment.

19. In an assembling machine, a table, one or more side plates mounted thereon forming a compartment, an end plate for the compartment and providing a mouth at the lower end thereof, and means for swinging the end plate to swing the lower end thereof outward to vary the size of the mouth.

In testimony whereof we affix our signatures.

ELIZABETH LIVINGSTON.
LOUIS LIVINGSTON.