Dec. 22, 1931. F. W. LAENCHER 1,837,450

PRINTING APPARATUS

Filed May 10, 1930 5 Sheets-Sheet 1

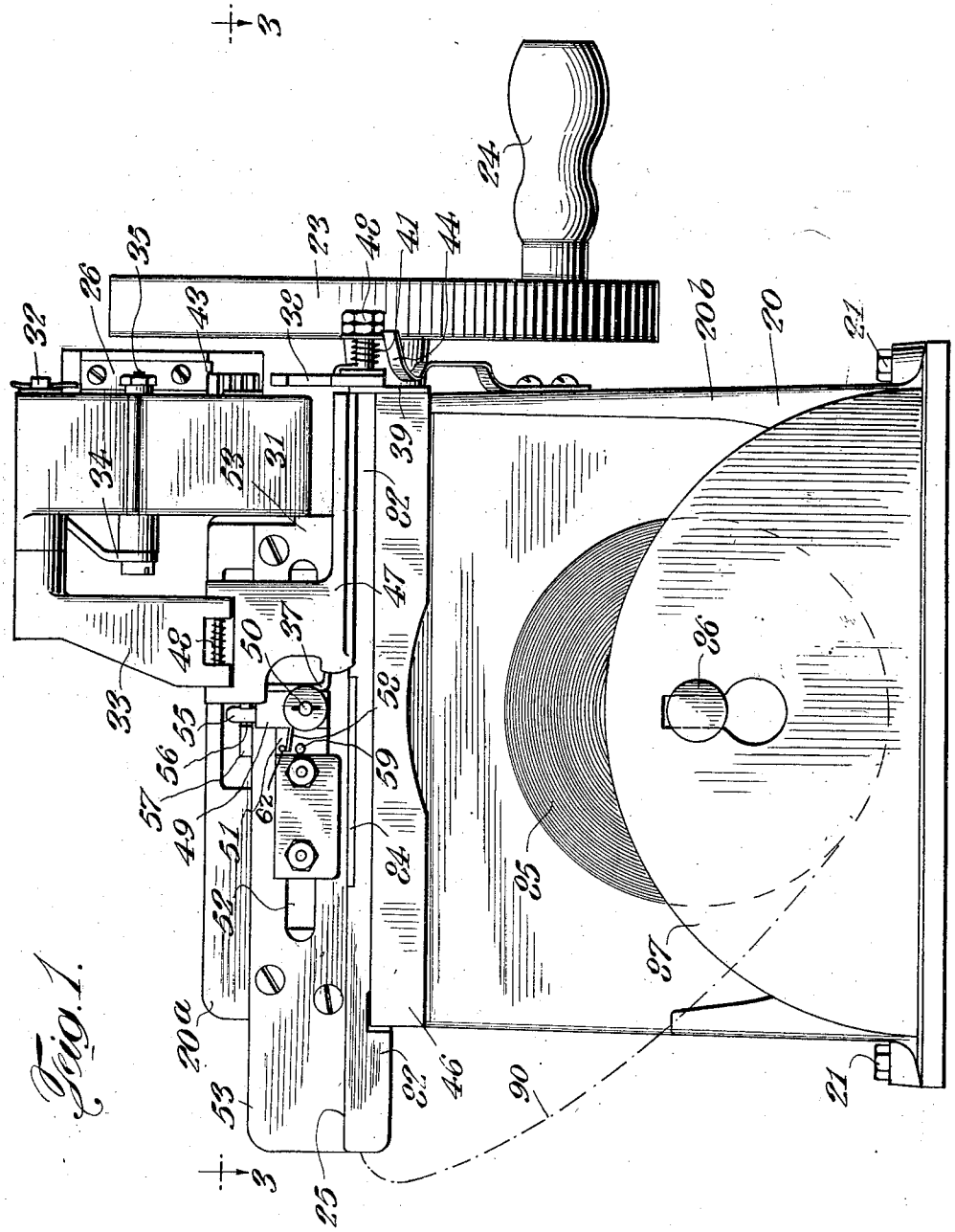


Fig. 1.

INVENTOR
Frederick W. Laencher
BY
Emery, Booth, Varney & Whittemore
ATTORNEYS

Dec. 22, 1931. F. W. LAENCHER 1,837,450

PRINTING APPARATUS

Filed May 10, 1930 5 Sheets-Sheet 2

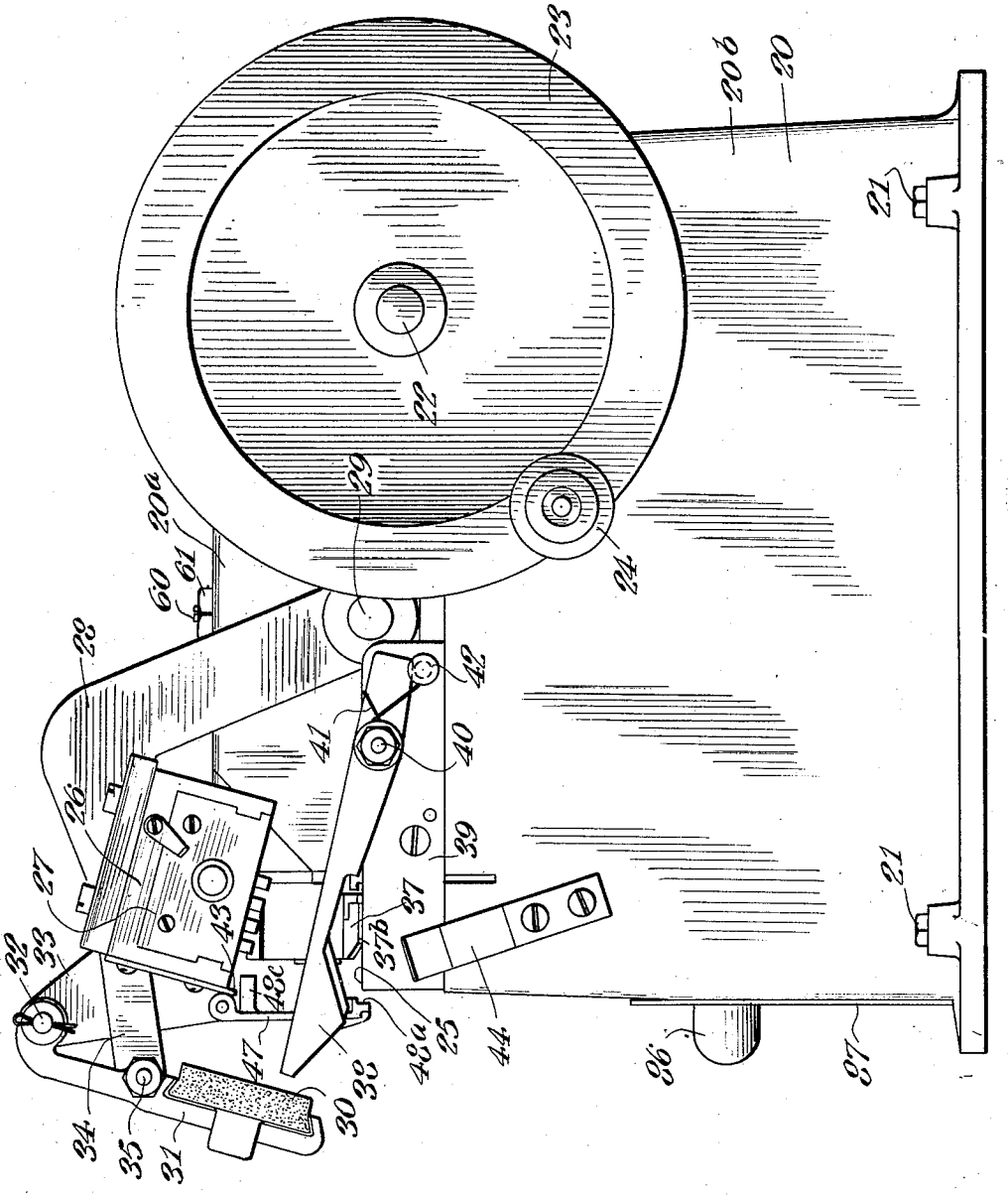


Fig. 2.

INVENTOR
Frederick W. Laencher
BY
Emery, Booth, Varney & Whittemore
ATTORNEYS

Dec. 22, 1931. F. W. LAENCHER 1,837,450

PRINTING APPARATUS

Filed May 10, 1930 5 Sheets-Sheet 3

Fig. 3.

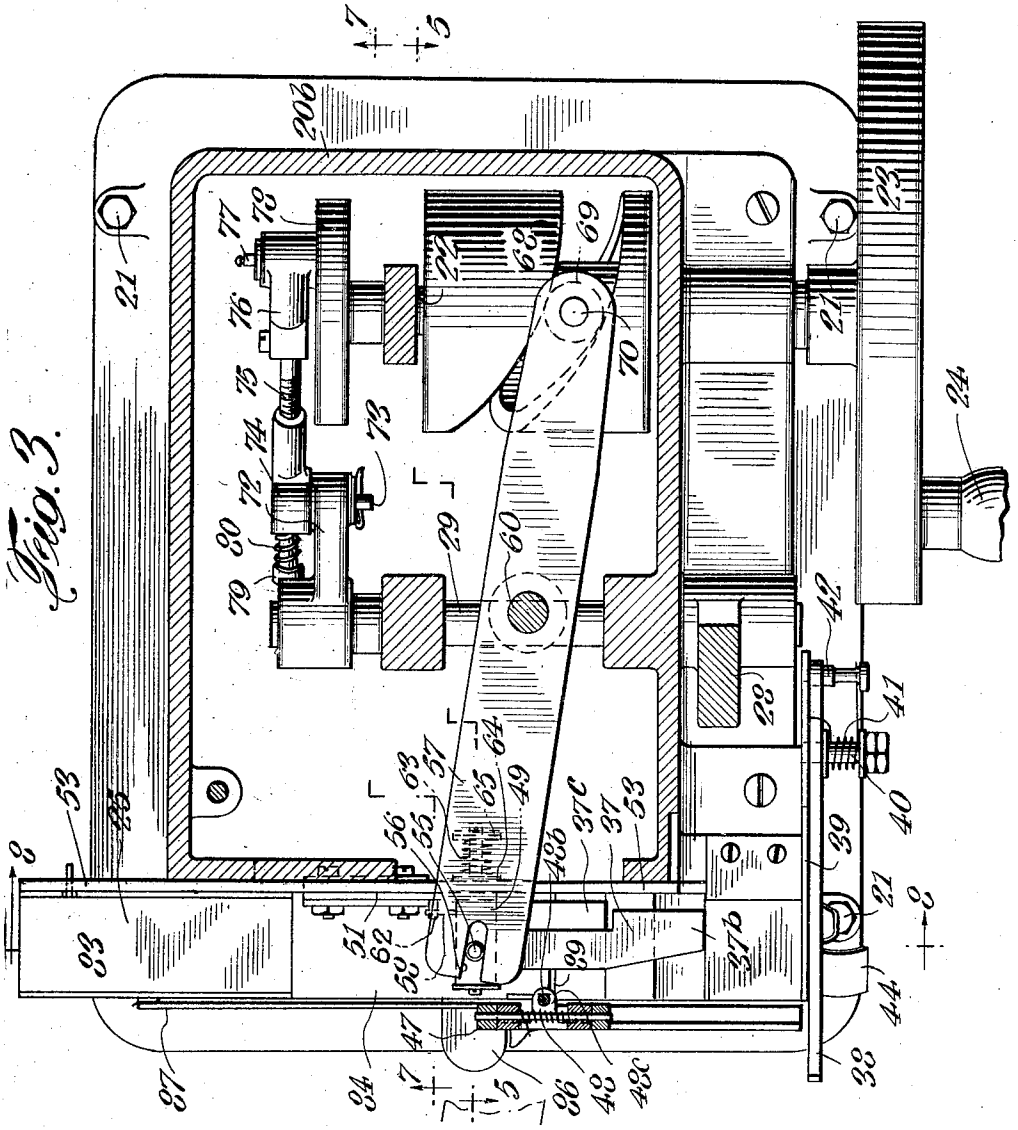
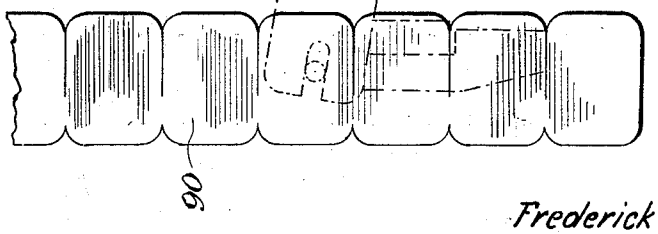


Fig. 4.



INVENTOR
Frederick W. Laencher
BY
Emery, Booth, Varney & Whittemore
ATTORNEYS

Dec. 22, 1931. F. W. LAENCHER 1,837,450

PRINTING APPARATUS

Filed May 10, 1930 5 Sheets-Sheet 4

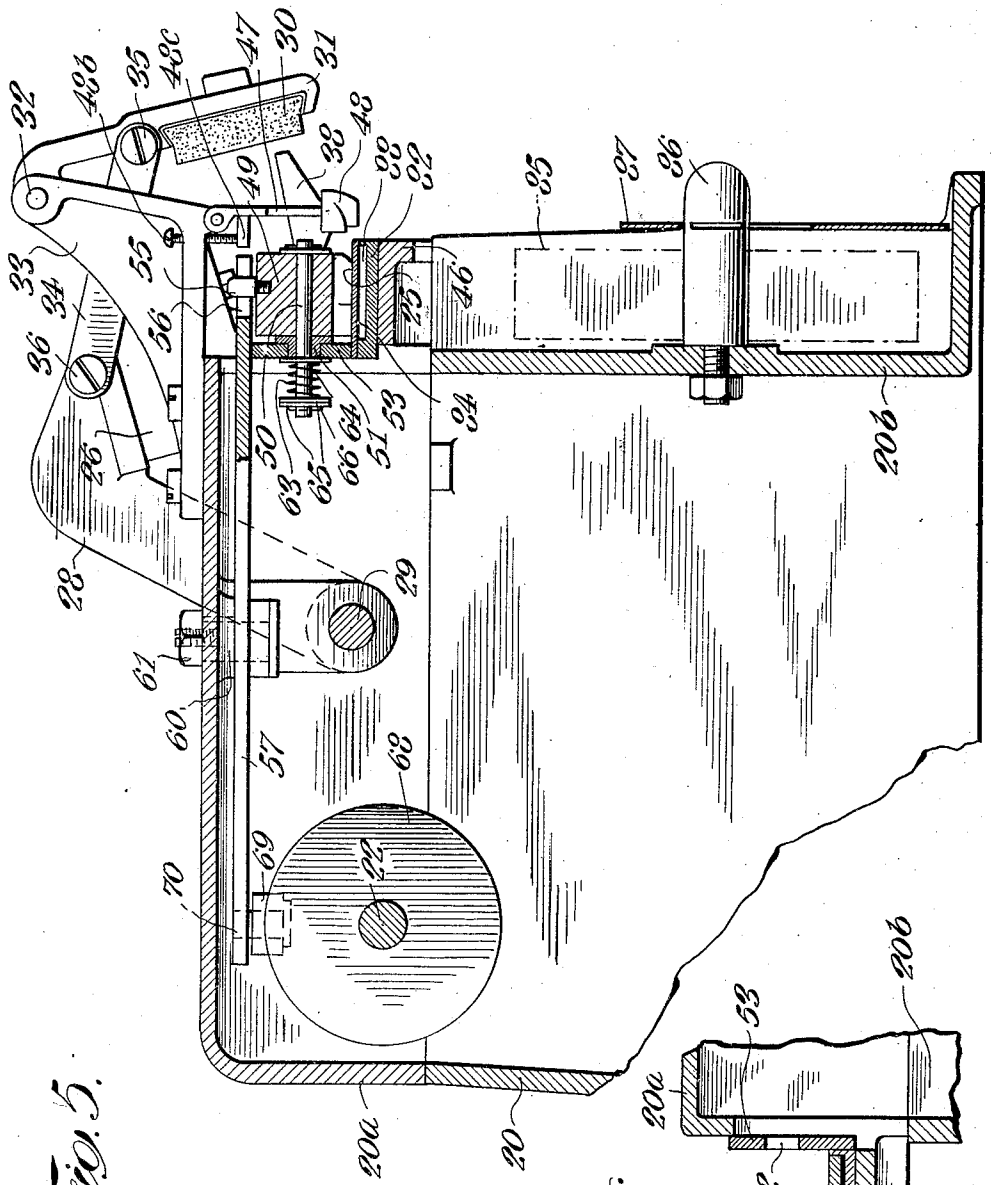


Fig. 5.

Fig. 6.

INVENTOR
Frederick W. Laencher
BY
Emery, Booth, Varney & Whittemore
ATTORNEYS

Dec. 22, 1931. F. W. LAENCHER 1,837,450

PRINTING APPARATUS

Filed May 10, 1930 5 Sheets-Sheet 5

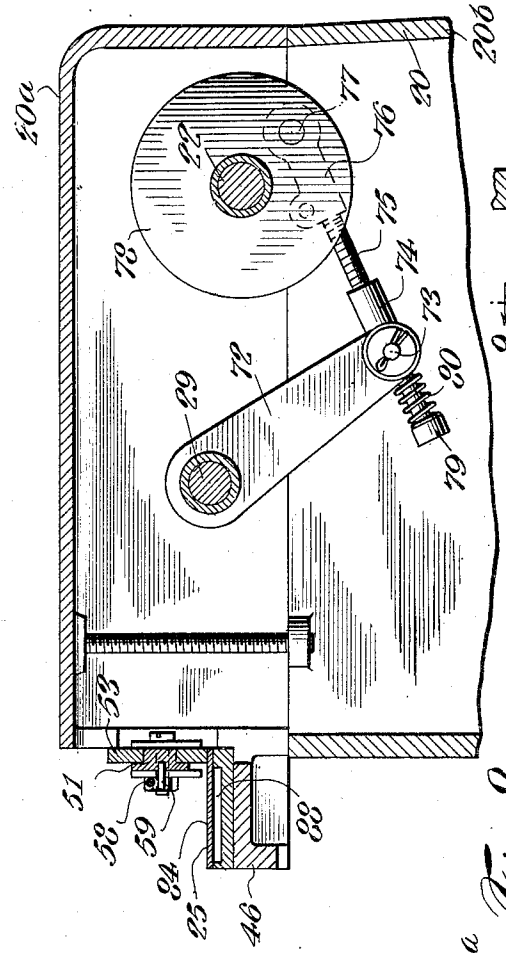


Fig. 7.

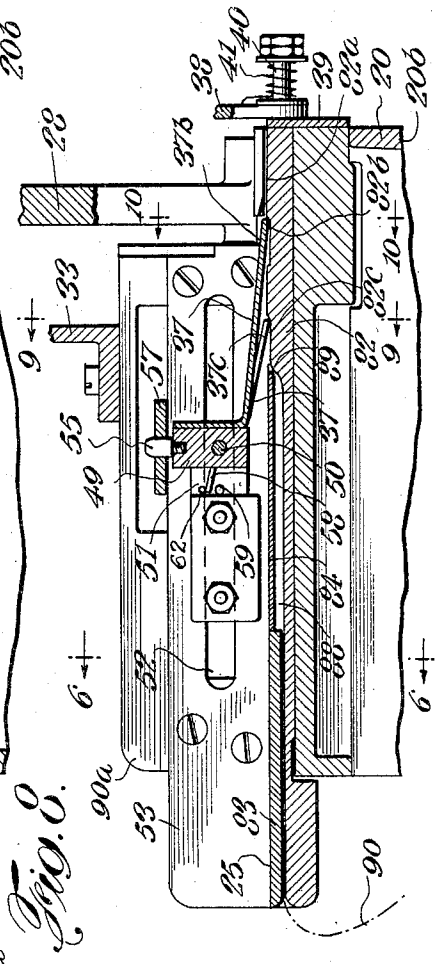


Fig. 8.

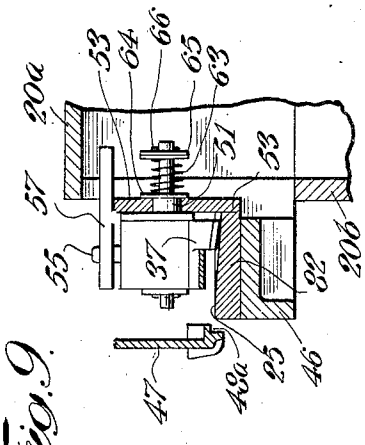


Fig. 9.

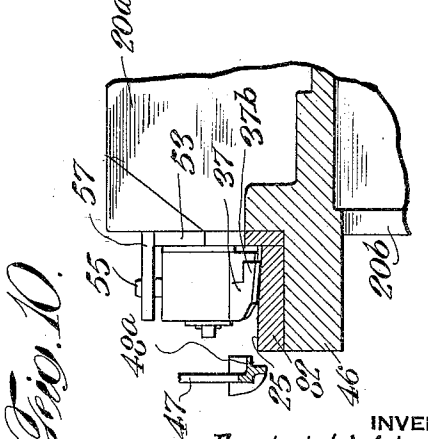


Fig. 10.

INVENTOR
Frederick W. Laencher
BY
Emery, Booth, Varney & Whittemore
ATTORNEYS

Patented Dec. 22, 1931

1,837,450

UNITED STATES PATENT OFFICE

FREDERICK W. LAENCHER, OF ELMHURST, NEW YORK, ASSIGNOR TO A. KIMBALL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

PRINTING APPARATUS

Application filed May 10, 1930. Serial No. 451,222.

This invention relates to printing apparatus, especially to apparatus for printing strips of tags and has for an object the provision of improvements in this art.

More particularly the invention has for its objects the provision of convenient and efficient apparatus for printing either thin adhesive tags or labels or relatively thick tags usually provided with attaching strings or staples; the provision of improved feeding means including the tag engaging means and feed adjusting means to obtain very accurate registry of the tags with the printing means; the provision of improved means for driving the printing head; and the provision of improved means for cutting the tags.

Other objects and various features of novelty will appear from the following description of a preferred illustrative embodiment of the invention. During the description reference will be made to the accompanying drawings, wherein:

Figure 1 is a front elevation of apparatus embodying the invention;

Figure 2 is a right side elevation;

Figure 3 is a horizontal section on the line 3—3 of Figure 1;

Figure 4 is a partial view corresponding to Figure 3 showing the feed finger positioned for feeding a strip of tags;

Figure 5 is a vertical section on the line 5—5 of Figure 3;

Figure 6 is a partial vertical section on the line 6—6 of Figure 8;

Figure 7 is a partial vertical section on the line 7—7 of Figure 3;

Figure 8 is a partial vertical section on the line 8—8 of Figure 3;

Figure 9 is a vertical section on the line 9—9 of Figure 8; and

Figure 10 is a vertical section on the line 10—10 of Figure 8.

Referring now particularly to the drawings of the illustrative embodiment (Figs. 1 and 2) the mechanism is built upon a box-like frame 20 which may when desirable be secured to a table or other suitable support by bolts 21. All of the moving parts of the machine are carried by the upper portion 20*a* which is bolted to the lower portion 20*b*.

Upon the frame 20 toward the rear there is rotatably mounted a main drive shaft 22. The shaft may be driven by any available power means but since the machine is light and designed for printing small lots of tags at any given time, it is driven by hand. For this purpose the shaft 22 is equipped with a fly wheel 23 and a handle 24.

Toward the front of the frame there is a platen table 25 cooperating with an oscillating printing head 26. The printing head carries a removable type chase 27. It is mounted upon a swinging arm 28 fast on a printing shaft 29.

Cooperating with the printing head 26 there is a swingable inking pad 30 removably held in an inking head 31 pivoted upon a stud shaft 32 fast in a fixed inking bracket 33. The inking head 31 is operated to coordinate with the printing head by a link 34 pivoted at opposite ends to the inking head and printing head respectively by pivot pins 35 and 36 respectively, the latter being found in Fig. 5.

A reciprocating oscillating finger 37 feeds the tags forward to printing position. For purposes of feeding, the tags are partially severed from each other at one edge. A knife 38 completes the severance of the tags as they move away from printing position. The knife cooperates with a hardened shear plate 39 attached to the frame. The top edge of the shear plate coincides with the top edge of the table 25.

The knife is pivoted upon a stud 40. It is urged upward by a torsion spring 41 embracing the stud 40 and engaging the knife and a stop stud 42 at its free ends. The latter stud also serves to limit the upward position of the knife. The knife is operated by the printing head, the latter having a strike piece 43 engaging the back of the knife blade upon each downward movement of the printing head. In case it is desired that the knife shall not operate it may be swung downward by hand until caught by a spring latch 44 where it is held below the plane of the table. To return the knife to operating position the spring latch is pulled out to release the knife

which is returned upward into operating position by the torsion spring.

The table consists of several plates mounted on a forwardly extending ledge 46 of the frame 20. The tags may be held by a guide 47 engaging the front edge of the tag strip and biased rearwardly by a light torsion spring 48. The guide has a mitered groove 48*a* on its inner and lower edge. The guide 47 is limited in its rearward movement (Fig. 5) by an adjustable screw 48*b* bearing against a lug 48*c* on the guide.

The feed finger 37 is rigidly attached to a pivot block 49 mounted on a pivot pin 50 carried in a cross-head slide 51. The cross-head slide is reciprocably mounted in a slot 52 of a vertical plate 53 defining the rear edge of the table.

It is necessary for the successful operation of the feed finger that it be moved downward to engage the strip of tags on its forward reciprocatory movement and be raised from the tags so as not to give them a retrograde movement on its rearward reciprocatory stroke. To effect this the pivot block 49 is provided with a pin 55 operating in the slot 56 of a cam lever 57. The downward swinging movement of the feed finger is limited by a lateral stud 58 carried by the pivot block 49 coming into engagement with a forwardly extending stud 62 secured to the slide. The upward swinging movement of the feed finger is limited by the lateral stud 58 coming into engagement with another forwardly extending stud 59 secured to the slide and spaced from the stud 62.

Referring now to Fig. 3 the cam lever 57 is seen to be mounted on an eccentric screw 60 secured (Fig. 5) to the top portion of the frame 20. The screw 60 has a head below the cam lever for supporting the same. The screw is secured to the frame by a lock nut 61 threaded on the upper portion of the screw. By loosening the lock nut and turning the screw 60 with a screw-driver the pivot center of the cam lever 57 may be shifted and when the lock nut is again tightened on the screw 60 the lever is held in its adjusted position. The purpose of this adjustment is to secure accurate registry of the tag in printing and cutting position, it being realized that since the tags are partially slitted a very accurate positioning must be secured if the knife is to cut them across in exact registry with the slits.

Still referring to Fig. 5 the slide 51 is resiliently held in the slot 52 by a coil spring 63 disposed on the pivot pin 50 between washers 64 and 65, the former frictionally engaging the rear surface of the vertical plate 53 and the latter engaging the outer end of the spring. The assembly may be mounted on the pin 50 by a cotter pin 66.

Referring to Fig. 3 the main shaft 22 carries a double faced cylindrical cam 68 actuating the cam follower roller 69 carried by the cam pin 70 affixed to the end of the cam lever 57. In case this cam becomes worn the utility of the pivot adjustment for the cam lever is particularly useful. The worn cam may be continued in service and the tags will be set as accurately in position as if the cam were new.

It has already been stated that the printing arm 28 is rigidly mounted on the printing shaft 29. In Figures 3 and 7 the drive for the printing shaft is found to consist in a rock arm 72 fast to the other end of the printing shaft actuated by a pivot pin 73 secured to a sleeve 74. The sleeve 74 is slidable on a turnbuckle rod 75. The rod is threaded into a crank pin sleeve 76 rotatable upon a crank pin 77 secured to the crank disc 78 fast on the main shaft 22. The outer end of the rod 75 is provided with a head 79 and between this head and the slidable sleeve 74 there is disposed a coil spring 80.

This construction provides for resilient movement or give of the parts when the printing head engages a ticket and compensates for different thicknesses of ticket without danger of breaking the operating parts and with approximately the same printing pressure on the tags.

Referring to Fig. 8, the main plate 82 of the table provides the platen portion 82*a*; and this together with the auxiliary plates 83 and 84 forms the complete upper surface of the table. When strips of tags of definite and relatively short lengths such as staple-bearing tags are being printed they travel along this upper surface of the table and the spring-pressed guide 47 engaging the front edge of the strips keeps them in alignment and prevents retrograde movement.

When sticker tags or labels are fed a somewhat different path is followed. These (Fig. 1) are preferably fed from a roll 85 of indefinite length mounted on the axle 86 and held in position by a readily removable retaining plate 87. The strip from the roll 85 travels (Fig. 8) under the plate 83, which is removable and which applies tension on the strip, thence through the guide channel 88 under the fixed plate 84, and emerges upon the top surface of the table through the slot 89 behind the feed finger. In this case the tension plate 83 prevents retrograde movement of the strip.

As previously mentioned and as appears from Fig. 4, the strips of tags 90 whether of the staple-bearing or gummed label type are slitted partly across from one edge—the rear edge according to their disposition in the present machine. The feed finger acts upon the forward edge of these slits to successively advance the tags in steps to printing position. In order that the finger end may properly engage this forward edge of the

slits it is necessary that the rearward edge be pressed down.

To effect this (Fig. 8) the plate 82 is notched at 82*b* and 82*c* beneath the branched ends 37*b* and 37*c* of the feed finger. The forward finger end 37*b* is spaced from the end 37*c* by the width of one tag. As a new strip of tags is pushed in toward printing position the trailing end 37*c* advances the tags into correct position to be printed upon. The leading end 37*b* pushes off the last tag of a strip.

The finger ends operate by pressing down upon the front edges of one tag while the rear edge of a preceding tag is supported above the front edges of notches 82*b* or 82*c*. Then as the finger end advances still pressing the edge of the trailing tag, it engages the slitted edge of the preceding tag and pushes it forward, the finger end riding up the inclined surface of the notch in its forward movement. On its return stroke the finger is held raised above the tags so as to produce no retrograde movement thereof.

The finger has a longer stroke than the width of a tag. Referring to the finger position in Figs. 4 and 8 and the corresponding cam position in Fig. 3 it is evident that the finger ends in their rearward position are disposed an appreciable distance behind the notches 82*b*, 82*c* but not far enough to feed two tags at once. The excess length of movement of the finger is taken up in slippage over the tags. The cam 68 and eccentric pin 60 are so disposed as to cause the finger at the end of its forward movement to stop accurately in the desired position so that the knife 38 will sever the tags in line with the slits previously made therein.

The operation of the machine will be obvious from the above description. While one embodiment of the invention has been described in detail for purposes of illustration, it is to be understood that various modifications and changes are permissible within the scope of the invention as set forth in the subjoined claims.

What I claim is:

1. Apparatus for printing strips of tags comprising in combination, a printing table, a printing head actuated by a telescopic spring-pressed rod, a feed finger provided with tandem tag-engaging ends, means for lowering said finger and moving it forward in tag feeding direction and lifting it when returning it, said table being provided with notches cooperating with said finger ends to cause them to engage the front edges of slits pre-formed in the strips of tags, a knife actuated in one direction by the printing head for severing tags, means to hold said knife when desired in inoperative position below the surface of the table and means included in said finger actuating means for adjusting the forward stroke of the finger to stop the strip in accurate position for said knife.

2. Apparatus for printing strips of tags, comprising in combination, a table along which strips of tags travel and a finger for feeding tags along said table, the table being provided with a notch co-operating with said finger to enable it to obtain a pushing engagement with the strip.

3. Apparatus for printing strips of partially severed tags, comprising in combination, a table along which strips of tags travel, and a reciprocating presser finger for feeding tags along said table, said table being shaped to cause said finger to press down the forward edge of a trailing tag below the rear edge of a leading tag and to engage the trailing edge of the leading tag to push the strip forward.

4. Apparatus as set forth in claim 3 in which said finger is provided with two tandem operating ends and said table being provided with a corresponding number of notches for the purposes described.

5. Apparatus for printing strips of tags, comprising in combination, a table, a printing head, means to feed a strip in tag-width increments along said table, a yieldingly mounted knife for severing tags from the strip, and means for causing engagement of said knife by said printing head during its printing stroke to thereby sever a printed tag.

6. Apparatus for printing strips of tags, comprising in combination, a table, a printing head, means to feed a strip of tags along said table, a knife for severing tags from said strip, said knife being raised by a spring and being moved downward to cut by said printing head, and means to latch said knife down in inoperative position.

7. Apparatus for printing strips of partially severed tags, comprising in combination, means to print said tags, a knife to complete the severance of said tags, a reciprocating finger for feeding said tags, a lever operating said finger and an eccentric-adjusted pivot for said lever to vary the stroke of said feed finger to stop the tags accurately in position where the knife will sever them along the pre-formed lines of partial severance.

8. Apparatus for printing strips of tags, comprising in combination, a feed finger, a slidable cross-head, a pivot on said cross-head supporting said finger, and means acting through said finger at one side of its pivot for reciprocating it and simultaneously biasing it about its pivot.

9. Apparatus for printing strips of tags, comprising in combination, a feed finger, a slidable cross-head having friction in its guides, a pivot on said cross-head supporting said finger, a member acting upon said finger above its pivot to reciprocate it and its cross-head and simultaneously bias the

finger about its pivot, the finger being biased downward when moved forward to feed the strip and being biased upward to clear the strip when moved rearward.

10. Apparatus as set forth in claim 9 in which cooperating elements are provided on said cross-head and finger to limit the biasing movement of said finger.

11. Apparatus for printing strips of tags either stiff or flexible, comprising in combination, a printing head, a platen cooperating therewith and a table providing separate means for guiding either flexible or stiff strips of tags to said platen along the same plane and in the same direction.

12. Apparatus for printing strips of tags of either the staple or gummed type, comprising in combination, a printing head, a platen cooperating therewith, and means for starting said tags along different levels according to type and presenting them at the same level to said platen.

13. Apparatus for printing strips of tags of either the stiff and staple-bearing or flexible and gummed type, comprising in combination, a printing head, a platen cooperating therewith, a table surface in the plane of said platen for staple-bearing tags to travel over and a channel below said table and emerging thereupon for directing flexible tags to said platen.

14. Apparatus as set forth in claim 13 in which said table surface is formed in part by a movable plate which exerts a friction on the flexible tags travelling below the table surface.

15. Apparatus for printing flexible strips of tags, comprising in combination, a table along which said strip travels to printing position, a fixed journal below said table for supporting a roll of said strip, and a removable plate having a hole and slot connection with a groove in said journal for retaining the roll.

In testimony whereof, I have signed my name to this specification this 9th day of May, 1930.

FREDERICK W. LAENCHER.