May 16, 1933. H. A. FOOTHORAP 1,909,148

TOLL POSTING MACHINE

Filed Dec. 31, 1925 9 Sheets-Sheet 1

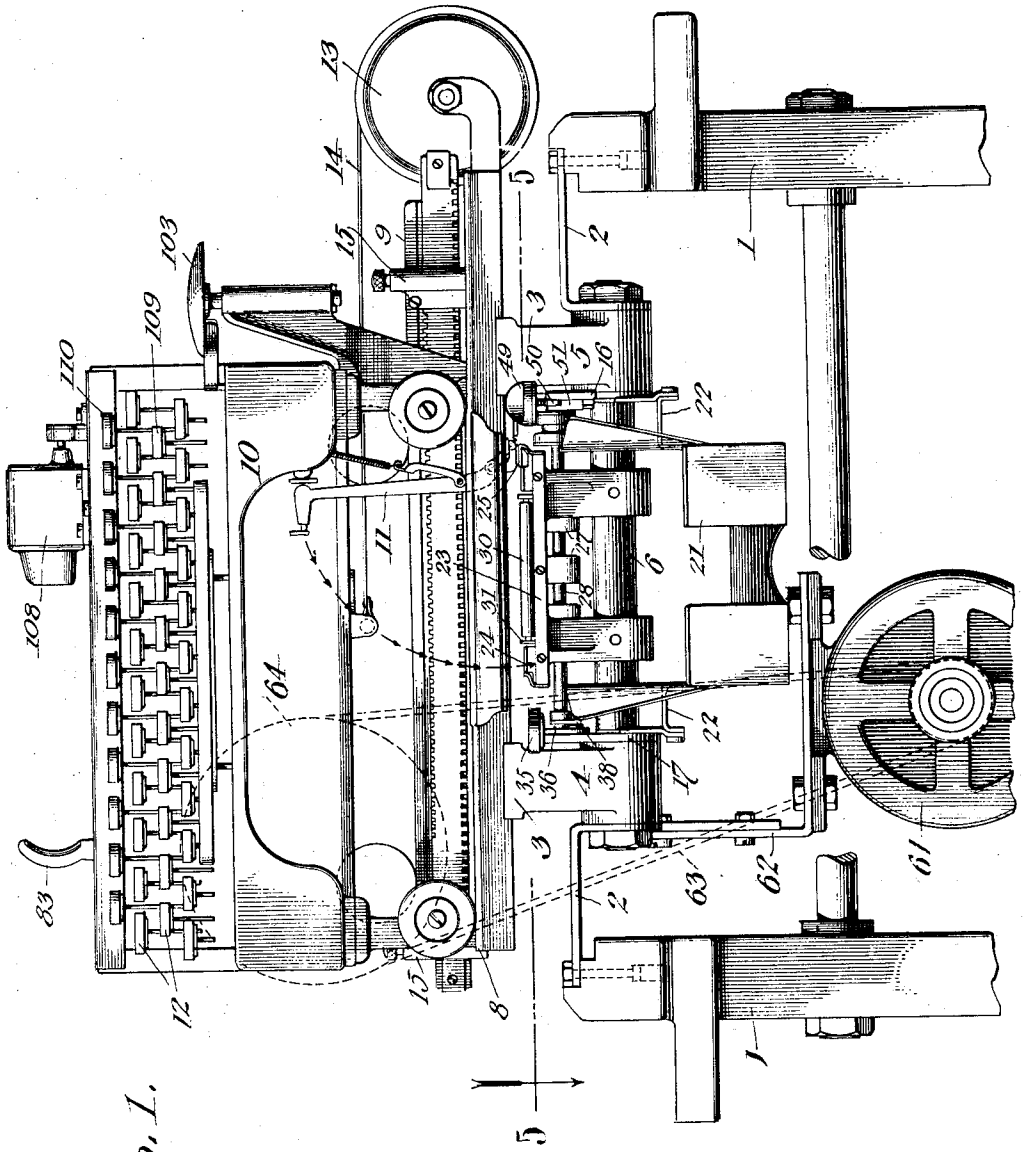


Fig. 1.

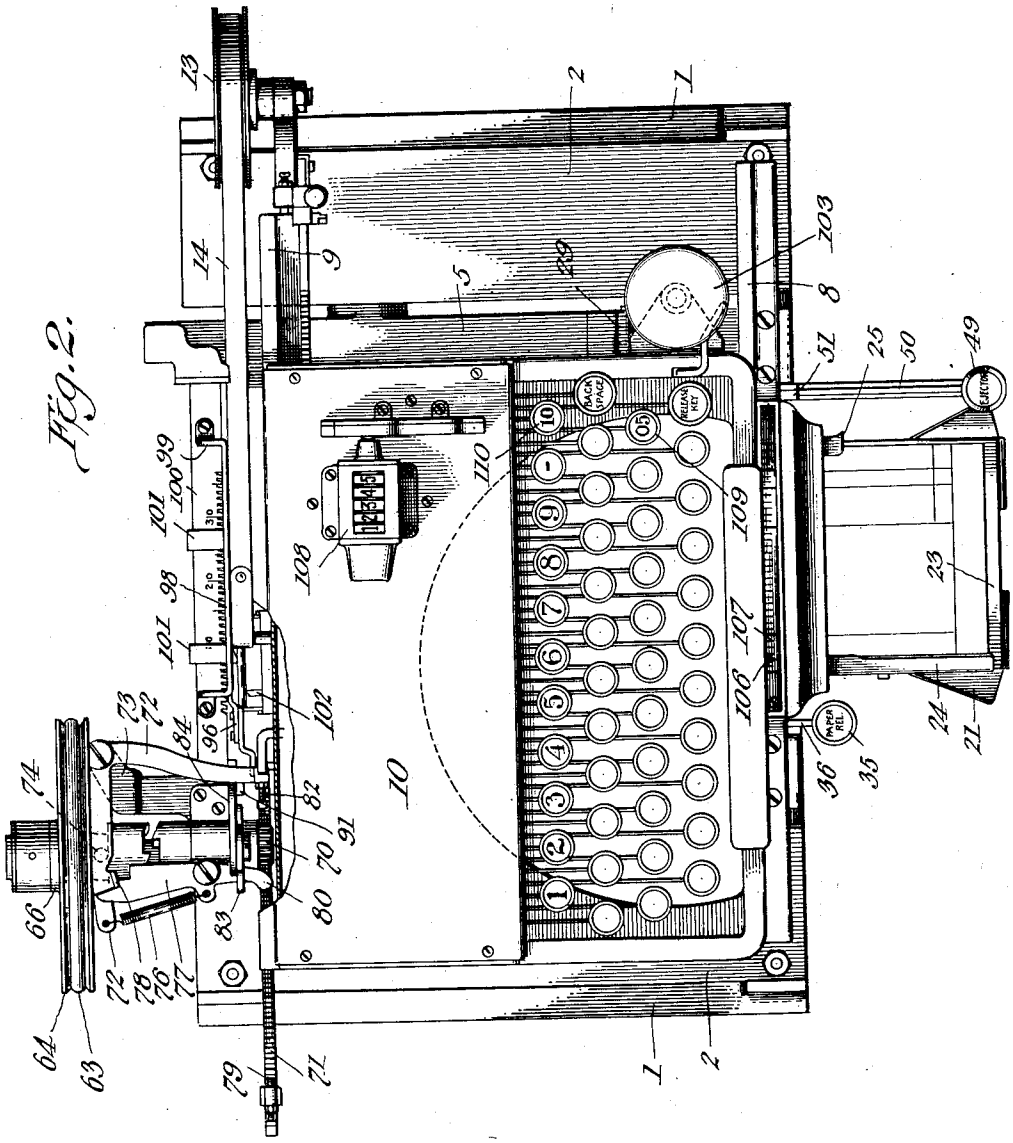
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TOLL POSTING MACHINE

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Fig. 2.



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TOLL POSTING MACHINE

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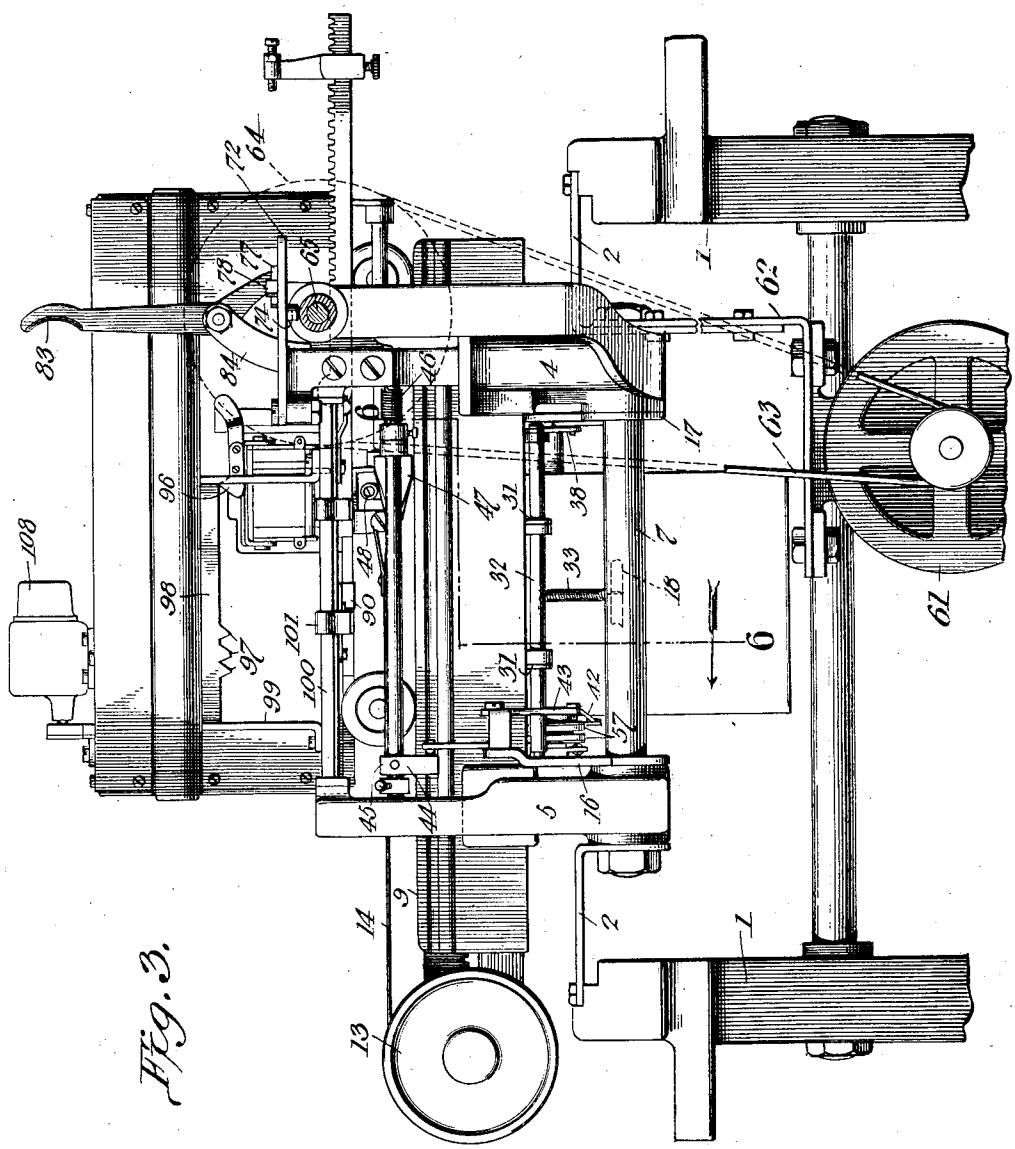


Fig. 3.

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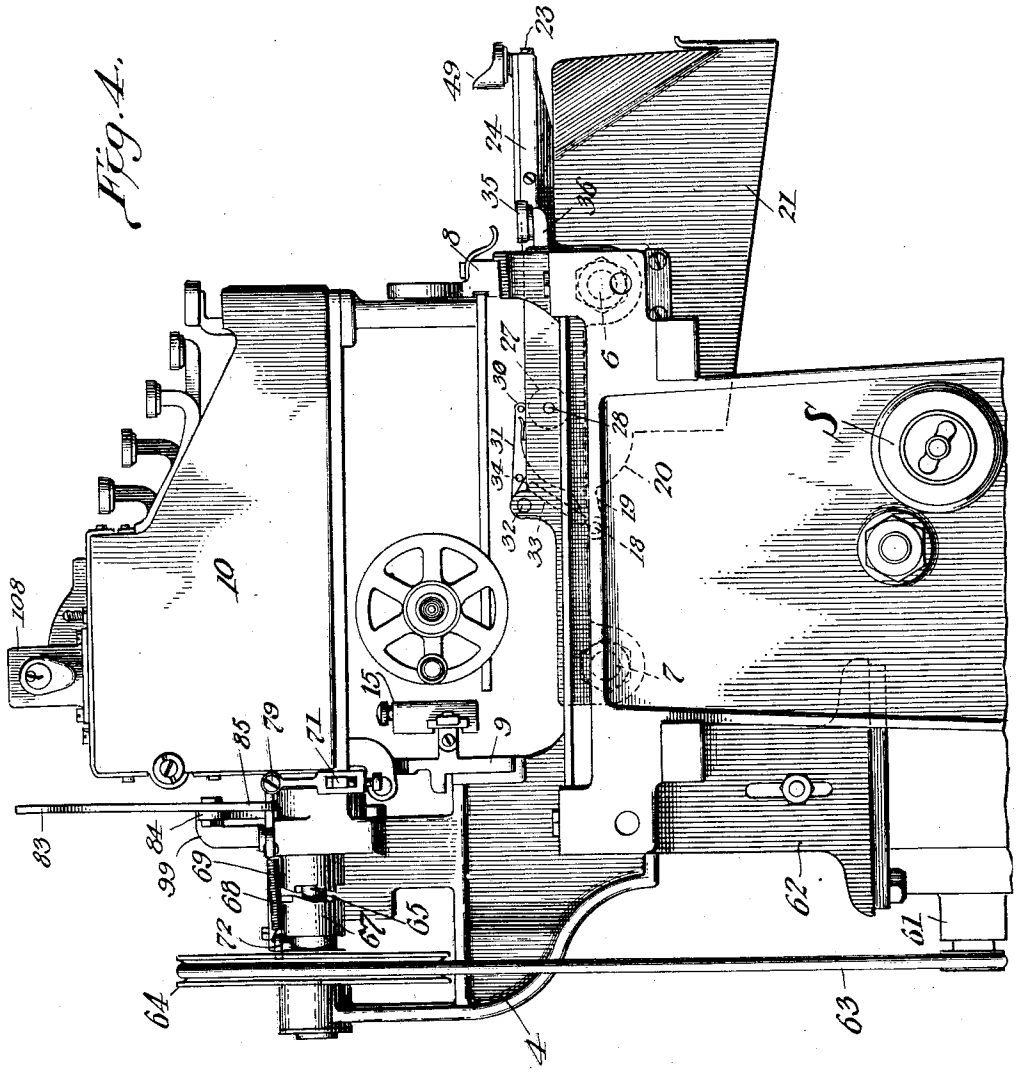
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TOLL POSTING MACHINE

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Fig. 4.



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TOLL POSTING MACHINE

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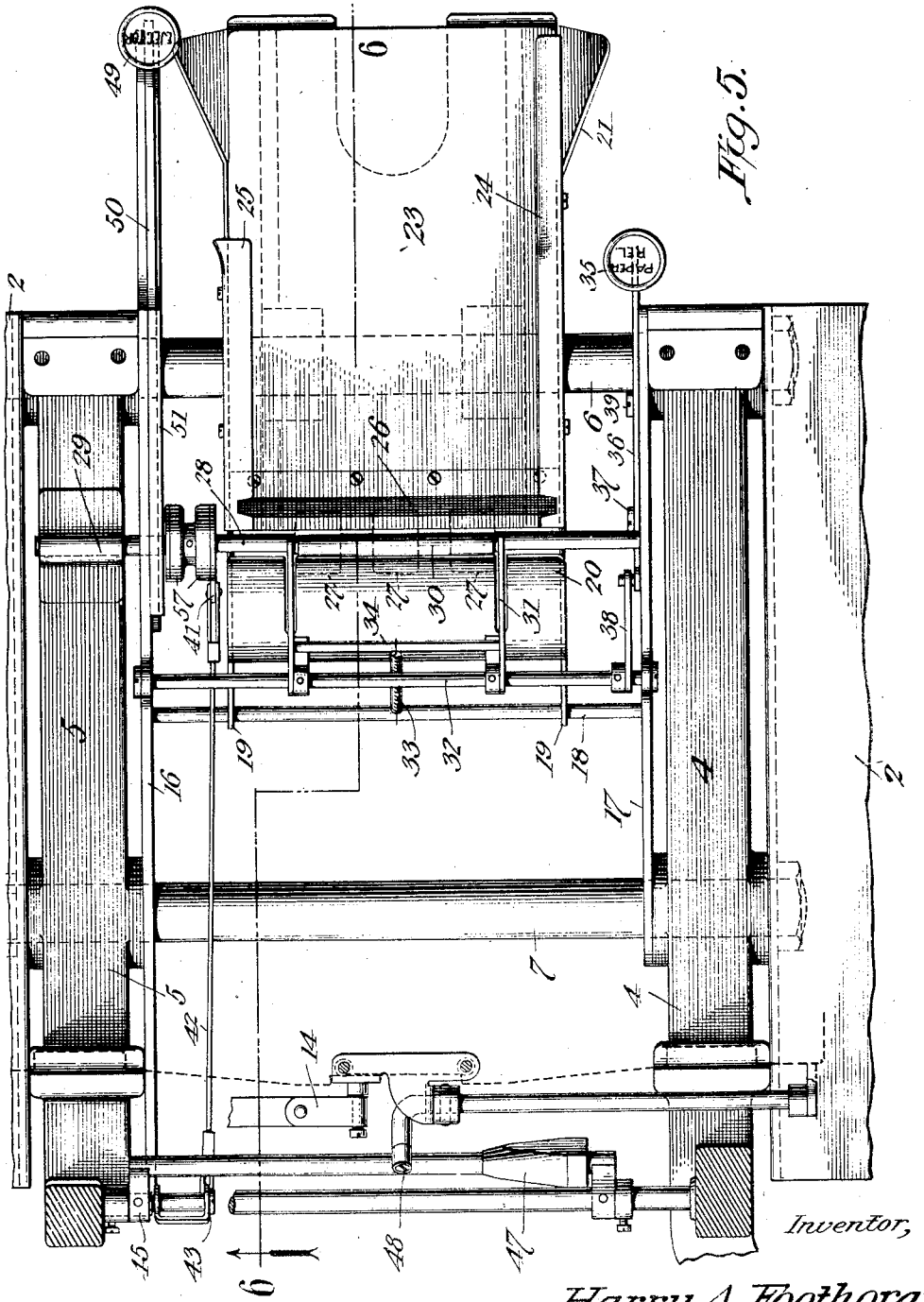


Fig. 5.

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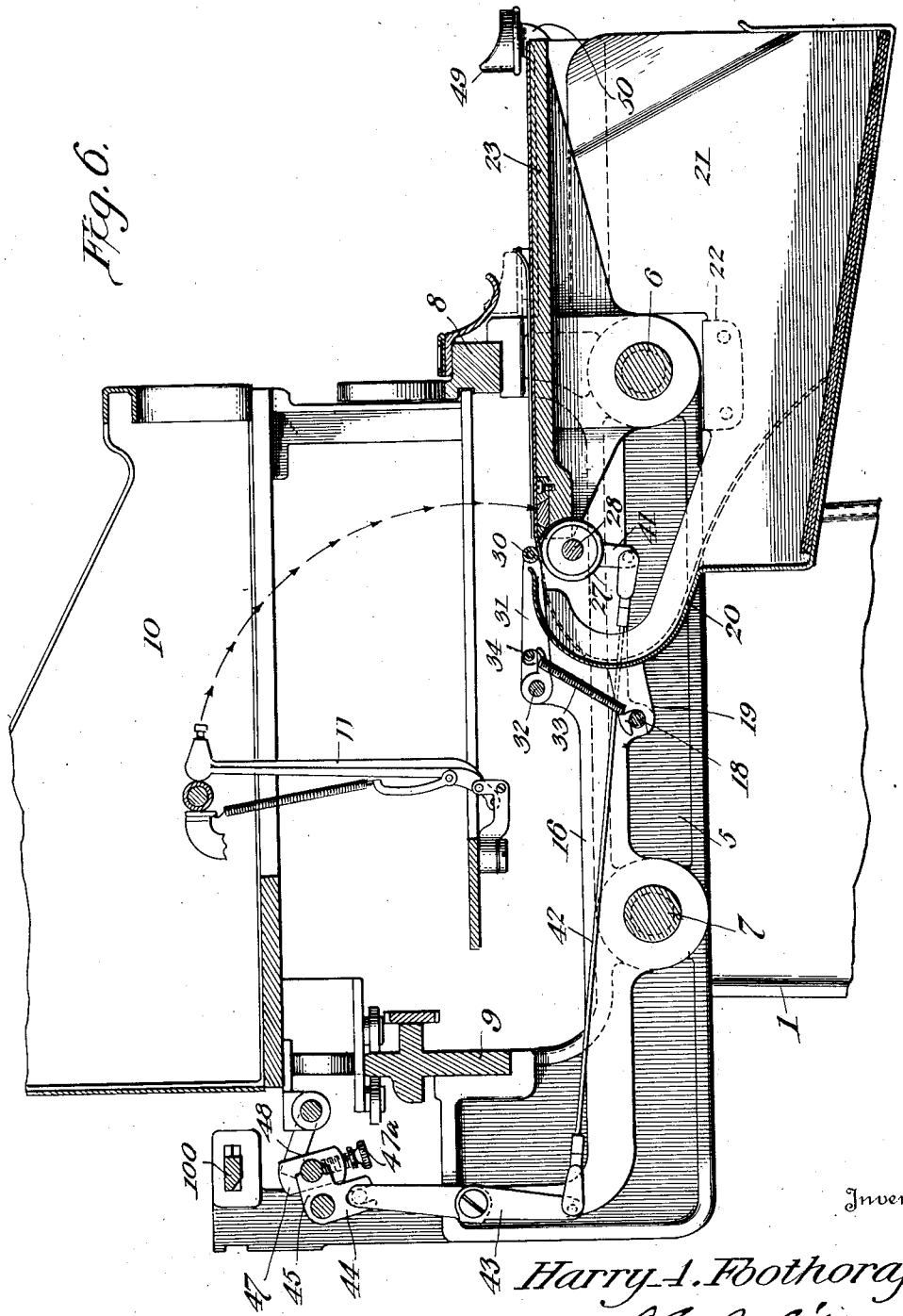
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TOLL POSTING MACHINE

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Fig. 6.



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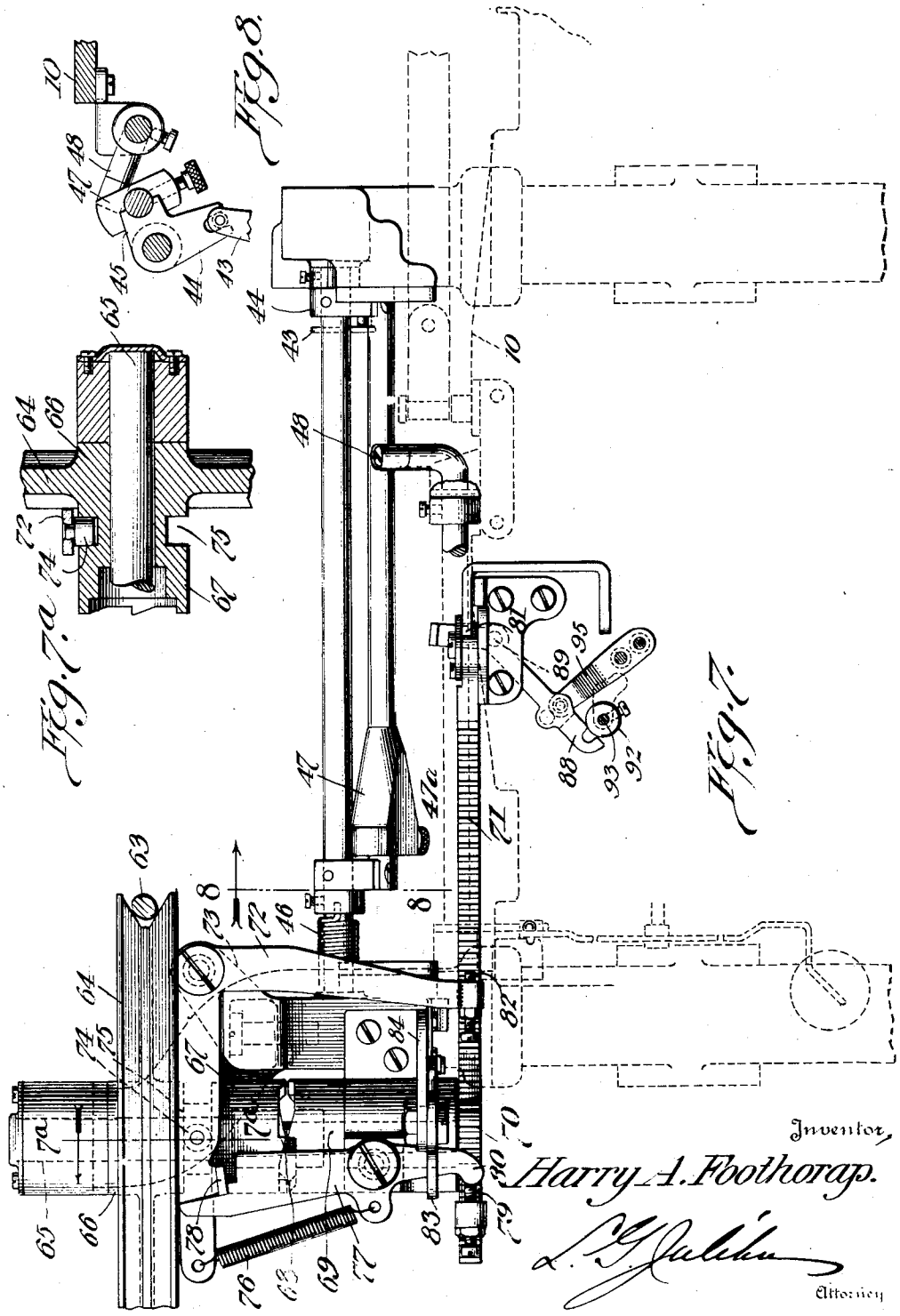
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TOLL POSTING MACHINE

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May 16, 1933. H. A. FOOTHORAP 1,909,148

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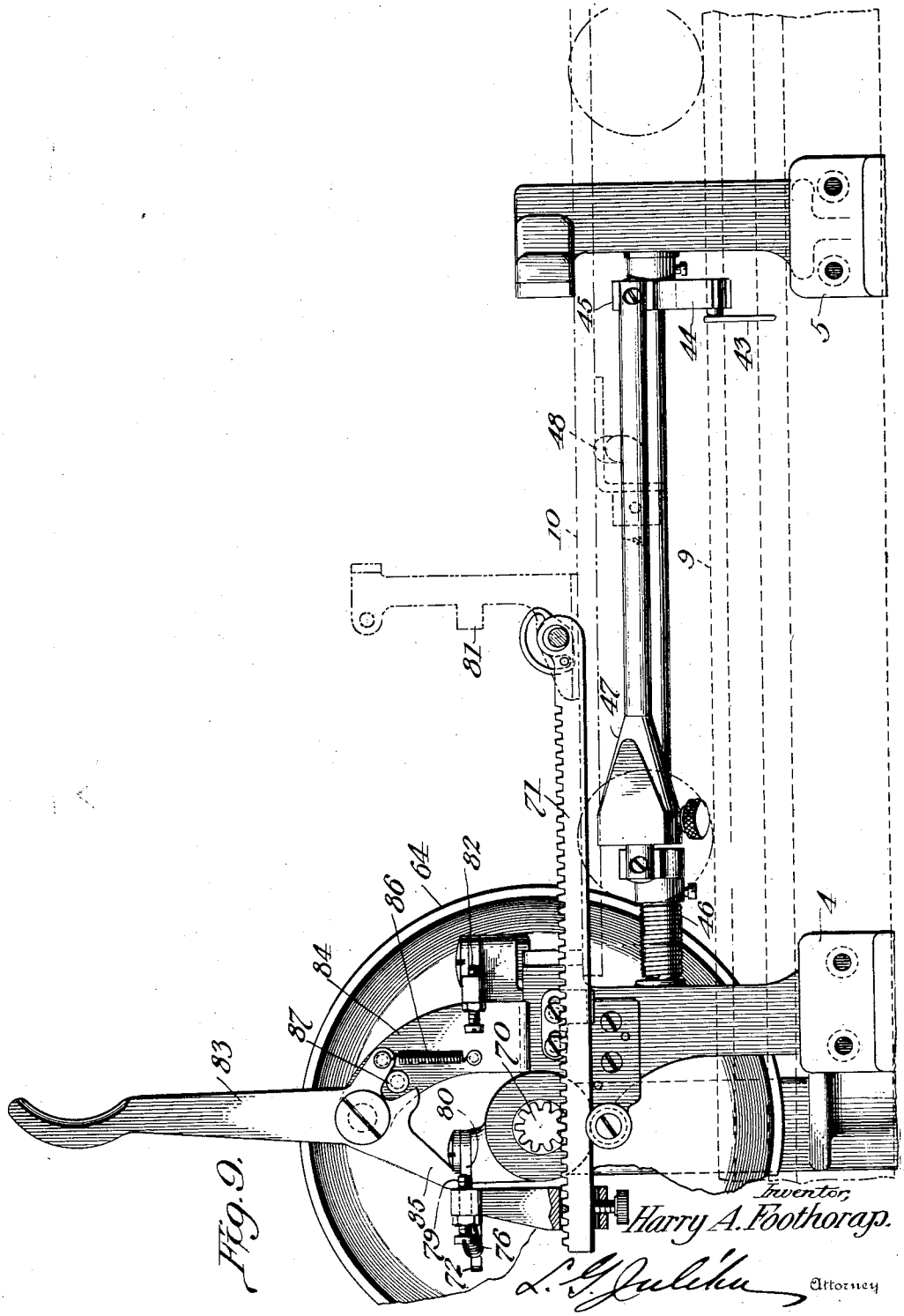


Fig. 9.

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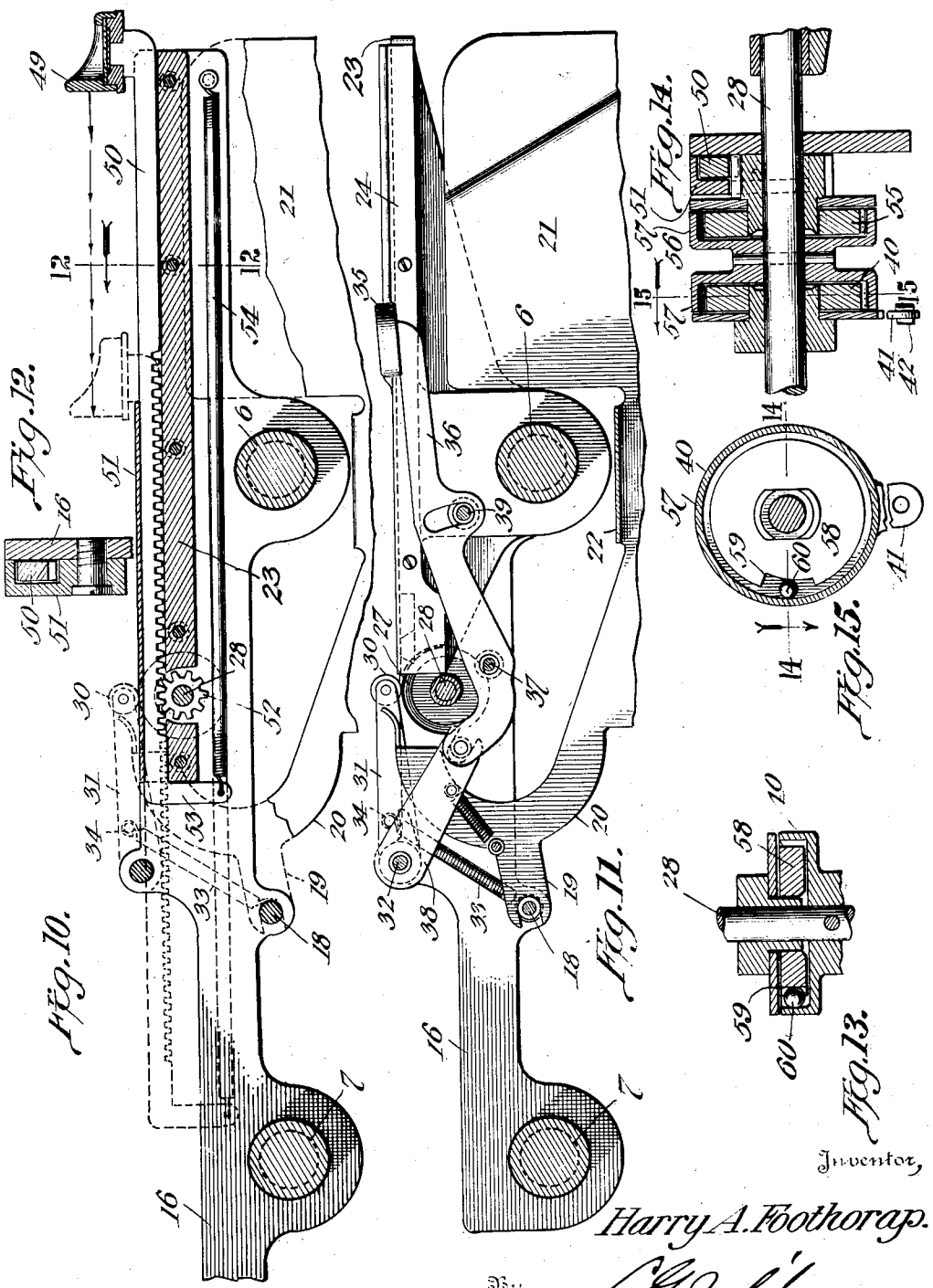


Fig. 10.

Fig. 11.

Fig. 12.

Fig. 14.

Fig. 15.

Fig. 13.

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Patented May 16, 1933 1,909,148

UNITED STATES PATENT OFFICE

HARRY A. FOOTHORAP, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO ELLIOTT-FISHER COMPANY, A CORPORATION OF DELAWARE

TOLL POSTING MACHINE

Application filed December 31, 1925. Serial No. 78,665.

This invention relates to a machine for printing toll slips such as are used by telephone companies and other public utilities.

The object of the invention generally stated is to produce a machine of this character embodying typewriting mechanism associated with mechanism for supporting, feeding, ejecting and stacking the toll slips to facilitate posting at high speed.

Subordinate objects of the invention will appear as the succeeding description is developed.

In the accompanying drawings:

Figure 1 is the front elevation of my machine with unimportant parts broken away.

Figure 2 is a top plan view thereof.

Figure 3 is a rear elevation with certain of the parts broken away.

Figure 4 is a side elevation.

Figure 5 is a horizontal section on the line 5—5 of Figure 1.

Figure 6 is a vertical section on the line 6—6 of Figures 3 and 5.

Figure 7 is a plan view, more particularly of the carriage retracting mechanism.

Figure 7ª is a detailed section on the line 7ª—7ª of Figure 7.

Figure 8 is a detailed section on the line 8—8 of Figure 7 showing a part of the mechanism for line spacing the toll slip.

Figure 9 is an elevation of the structure shown in plan view in Figure 7.

Figure 10 is a section through the paper table and associated parts designed more particularly to show the form ejector.

Figure 11 is an elevation of the toll slip or form release mechanism.

Figure 12 is a section on the line 12 of Figure 13.

Figure 13 is a horizontal section of one of the cam clutches forming a part of the form feeding mechanism.

Figure 14 is vertical section of said clutches taken on the line 14—14 of Figure 15, and

Figure 15 is a detail section taken on the lines 15—15 of Figure 14.

Referring to the reference numerals on the drawings:

Surmounting the pedestal 1 and carried by brackets 2 extending inwardly therefrom is a frame 3, the side members 4 and 5 of which are rigidly connected in spaced relation by front and rear transverse bars 6 and 7. The frame 3 in turn supports the front and rear carriage guides 8 and 9 of an Elliott-Fisher typewriter carriage 10 which is similar in construction and equipment to the carriage of the well known Elliott-Fisher machine of commerce. There are certain specific exceptions to this general statement which will be hereafter indicated. Suffice it to say for the moment that the carriage 10 is equipped with the usual recording mechanism including a series of type arms 11 and operating keys 12, by the manipulation of which letters and numerals may be printed in the usual way. The carriage 10 is advanced by a spring drum 13 connected to the carriage by a tape 14 and this movement is controlled by the usual carriage feeding mechanism which includes a feed rack carried by the rear carriage guide and geared to the carriage through the medium of a key operated escapement mechanism not shown in the drawings since it is fully described in United States Letters Patent No. 1,203,519. The numeral 15 designates the usual adjustable margin stops the purpose of which will be understood.

At the inner sides of the frame members (see Fig. 5) are plates 16 and 17 carried by the bars 6 and 7 and connected by a transverse bar 18 engaged by lugs 19 projecting rearwardly from the curved rear end 20 of a form receptacle 21 (see Fig. 6) supported by brackets 22. Above the form receptacle 21 is mounted on the frame bar 6 a flat form table 23 which projects sufficiently in advance of the front carriage guide 8 to facilitate the placing of a form on the table by the operator. Along the opposite side edges of the form table 23 are form guides 24 and 25 which overlap and guide the side edges of the form. The right hand guide 25 terminates somewhat in the rear of the front edge of the table to facilitate the insertion of the form.

Adjacent to the rear end of the form table

and at the line of writing is a rubber or other suitable strip which constitutes a platen 26 which backs the form or work at the printing line in an obvious manner.

Located just beyond the end of the form table is a series of feed rolls 27 mounted on a feed shaft 28 (see Fig. 6) afforded bearings in the plates 16 and 17 and also having a special end bearing 29 on the frame member 5. A presser roll 30 clamps the form against the feed rolls 27 and is mounted in the swinging roll frame 31 carried by a rock shaft 32 afforded bearings in the plates 16 and 17 and drawn down into effective engagement with the form by a spring 33 connected to the rod 18 and to a cross bar 34 of the frame 31.

To release the paper or form from the feed rolls when desired, a paper feed release key 35 is located at the left of the paper table. This key 35 is located at the end of a release lever 36 fulcrumed on a stud 37 (see Figs. 5 and 11) and having a suitable connection at its rear end with an arm 38 secured to the shaft 32. A headed stud 39 preferably engages the slot in the forward portion of the lever 36 to retain and guide the same.

Two separate mechanisms are utilized to operate the paper feeding mechanism. One of these mechanisms is a manually operated ejector for the form, and the other is a carriage control automatic feed which upon the retraction of the carriage to begin a new line of writing causes the feeding mechanism to advance the toll bill or other form rearwardly the distance of one line space.

Describing first the automatic paper feed, depending from a one way clutch 40 on the feed roll shaft 28 is an arm 41 connected by a push rod 42 with the lower end of a lever 43 fulcrumed intermediately of its ends at one side of the frame 3 (see Fig. 6). The upper end of the lever 43 has a slot and pin connection with an arm 44 of a swinging bail 45 yieldingly retained in its normal position by a spring 46 and having a cam 47 which, when engaged by a projection 48 on the carriage 10, causes the bail to be swung sufficiently to rock the lever 43 and to swing the arm 41 for the purpose of rotating the shaft 28 and the feed rolls 27 sufficiently to feed the form one line space. The cam 47 is adjustable along the bail 45, the set screw 47*a* being provided for that purpose, so that the line spacing operation may be timed to occur at different points in the retraction of the carriage in accordance with different margin requirements controlled by the left hand margin stop 15.

The form ejector includes an ejector key 49 mounted at the front end of an ejector rack 50 mounted in a rack guide 51 secured to the plate 16. The rack 50 meshes with a pinion 52 on the feed shaft 28 and has an angular rear end 53 for the attachment of an ejector retracting spring 54 (see Fig. 10). When the operator has completed the posting, the toll slip may be ejected into a subjacent receptacle by placing a finger on the key 49 and moving the rack back against the resistance of the spring 54 until the movement is arrested by the rack guide as shown in dotted lines in Figure 13.

When the form is ejected from the form table, it will be noted that its rear edge will be guided in the substantially semi-cylindrical rear end portion of the form receptacle. This will cause the form to be curled back so that what has been its rear edge will advance into the storage portion of the form receptacle 21 and the form will have been reversed. That is to say, the curved end 20 of the form receptacle constitutes a form reversing guide because when the form has been deposited in the receptacle, its printed side will be the underside of the form although it was the upper side when the form was supported by the table. This handling of the form results in stacking the forms in the form receptacle in their proper numerical order and facing in the proper direction since it is obvious that when the stack of forms is removed and reversed, the top form will be the first form printed and the others will follow consecutively.

The pinion 52 with which the form ejector 50 meshes is mounted on the shaft 28 as stated but is not fixed thereto. It is designed to be connected to the shaft only when rotated in one direction; to-wit, the direction of paper feed and this result is accomplished by a one way clutch 55 similar to the clutch 40. These two clutches 40 and 55 are combined in a single structure as illustrated in Figures 13, 14 and 15. One member 56 of these combined clutches is pinned to the shaft 28 and has oppositely extending annular flanges 57, each of which encircles a clutch disc 58. One of these discs is movable with the arm 41 of the paper feed and the other is movable with the pinion 52 of the ejector mechanism. Each of these discs 58, as shown in Figure 15, has a peripheral recess 59 of diminishing depth and between the bottom wall of this recess and the flange 57 is a clutch ball 60. When the disc is rotated in the operative direction, the ball is wedged between the bottom of the recess and the flange to establish a driving connection between the disc and the shaft. When the disc is moved in the reverse direction, however, the ball is permitted to seek the deep end of the recess 59 and permits the disc to rotate independently of the clutch member 56.

The machine disclosed is equipped with motor operated carriage return mechanism which need only be briefly described in order to impart a thorough understanding of

the operation of the machine as a whole. A continuously operating motor 61, preferably electric, is mounted upon a bracket 62, and belted, as at 63, to a drive wheel 64 freely rotatable upon a suitably journaled shaft 65. The hub 66 of wheel 64 constitutes the movable member 67 of a clutch 68 including the fixed member 69 fast on the shaft 65. When the members 67 and 69 are engaged a carriage retracting pinion 70 keyed to the shaft 65 will be rotated to drive a carriage retracting rack 71 fixed to the carriage of the machine. Member 67 is moved by a bell-crank clutch operating lever 72 fulcrumed on a bracket 73 and having a stud 74 engaging a groove 75 in said hub. A spring 76 is attached at one end to the lever 72 and at its other end to a pivoted latch lever 77, said spring acting to urge the lever 72 in a direction to engage the clutch and also acting to hold the latch lever in a position to engage a projection 78 on the lever 72 and thus prevent clutch engaging movement of said lever 72.

When the carriage nears the end of its forward run a projection 79 on the carriage rack 70 engages the front end of the latch lever 77 to trip said lever to a releasing position whereupon the spring 76 will operate the clutch operating lever 72 to engage said clutch members. The motor will now return the carriage. As the carriage completes its retractile movement a projection 81 on said carriage will engage adjustable screw 82 on lever 72 and the final retractile movement of the carriage will swing the lever 72 against the resistance of the spring 76 to disengage the clutch and permit the latch lever 77 to reengage the projection 78 and hold the clutch members disengaged. A carriage return lever 85 is fulcrumed upon a bracket 84 so that its lower end 85 may be engaged with the end 80 of the latch lever 77 to trip the latter at any point in the travel of the carriage to shorten the run of the latter. A stop 87 limits movement of the lever 83. The controlling switch S for the motor is mounted on the pedestal of the machine.

The numerals 88, 89, 90, 91 and 95 designate respectively different parts of a carriage lock cooperating with the escapement (not shown). The foregoing carriage return mechanism and the carriage lock form per se no part of the present invention, but are covered in my divisional application Serial No. 440,143, filed March 29, 1930, to which attention is invited for a detailed understanding thereof.

There is also included in the machine automatic tabulating or skip spacing mechanism which is a modified form of similar decimal spacing mechanism shown in my Patent No. 1,512,282, and forms no part of the present invention. In this instance a dog 96 cooperates with a series of trips 97 on the trip bar 98 supported by standards 99 from the usual tabulator bar 100.

The dog 96 is arranged to retard the escapement, in a manner well understood, by contact with the trips 97 and thus effect automatic skipping of the carriage first over the decimal space in the amount column of the toll slip, then over a double space to the first position in the tax column and finally to the code column all at proper intervals in printing the "amount", "tax" and "code".

The numerals 100 and 101 designate the usual tabulator bar and stops respectively, and 102 a single movable stop operated by the usual tabulator key 103 suitably connected thereto (not shown), for instance in a manner similar to that shown in my Patent No. 1,280,697. The stops are arranged to halt the carriage for the initial letter on the left of the "places called" column and in position to begin the writing of the amount. The usual indicator 106 and scale 107 on the carriage and front guide rail respectively indicate at all times the position of the printing point. No claim is made herein to this tabulator mechanism nor to the tax counter 108 and its operating keys 109 and 110.

What I claim is:

1. The combination with a stationary frame and a platen mounted therein, of a carriage movable on the frame, line spacing mechanism including feed rolls, a swinging bail along which the carriage moves, operating connections at one side of the machine between the bail and the feed rolls, and means for operating the bail by movement of the carriage to the other side of the machine.

2. The combination with a frame and a platen mounted therein, of paper feeding mechanism including feed and pressure rolls located at the rear end of the platen, means at one side of the machine for operating the feed rolls, a swinging bail for operating said means extending across the machine and provided with a cam at the opposite side of the machine, a travelling carriage movable on the frame, and means movable with the carriage to engage the cam and swing the bail.

3. In a machine of the class described, the combination with printing mechanism, of a subjacent work table, a bar-like platen at the rear of the table, work feeding mechanism in the rear of the platen operative to pull the work rearwardly whereby work slips of shorter length than the table may be fed from the table onto and off the platen, an ejector mounted to slide along one side of the table and including a key normally located at the front of the table, and means for operating said work feeding mechanism by sliding movement of said ejector rearwardly.

4. In a machine of the class described, the combination with printing mechanism, of a subjacent work table, a flat platen at one end thereof, work feeding mechanism operative to pull a work sheet from the table over the platen, and work guides mounted at opposite edges of the table one of which is longer than the other to facilitate locating one edge of the work sheet thereagainst.

In testimony whereof I have affixed my signature.

HARRY A. FOOTHORAP.