Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 1

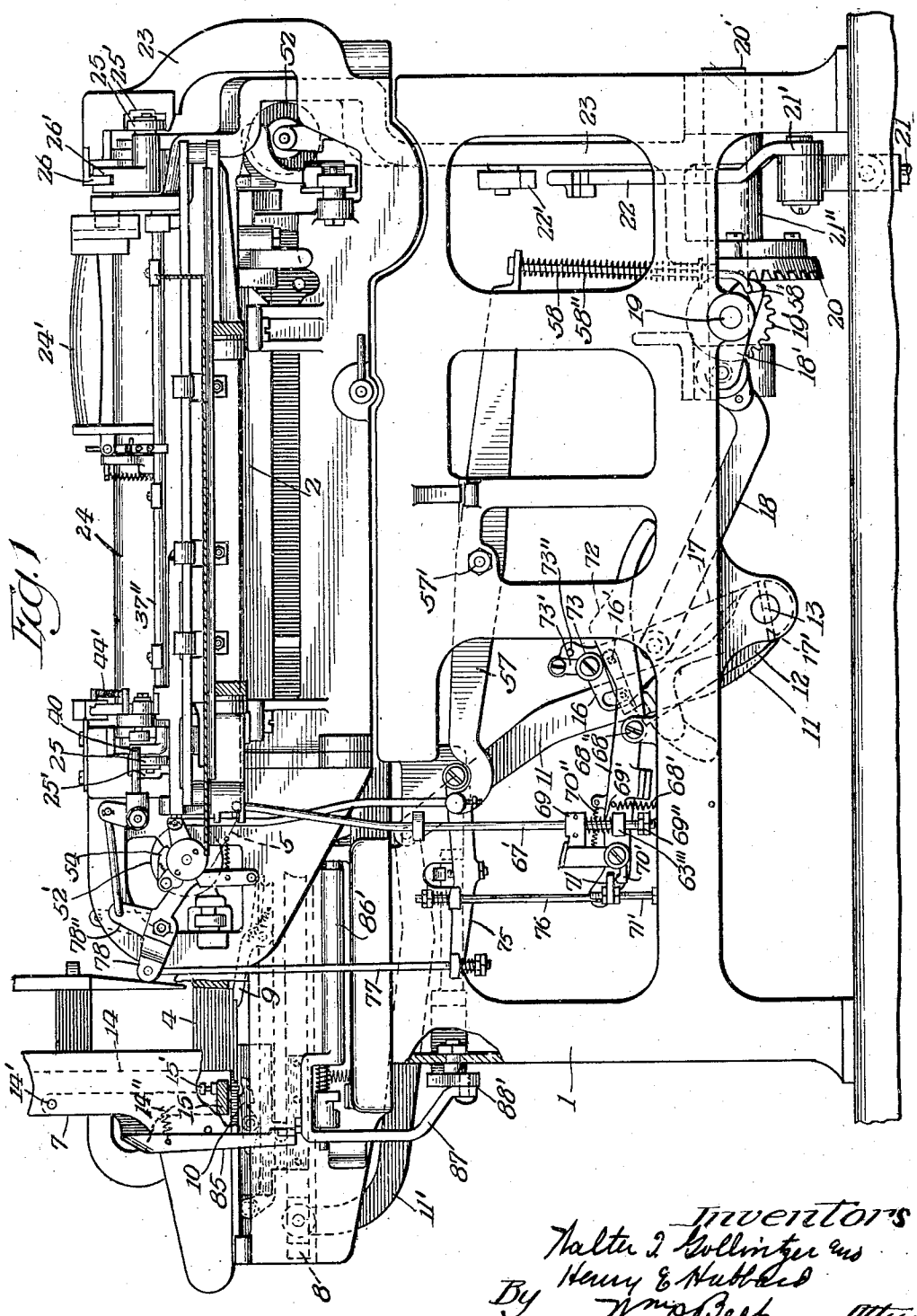


FIG. 1

Inventors
Walter T. Gollwitzer et al
Henry E. Hubbell
By Wm. O. Beck Atty.

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 2

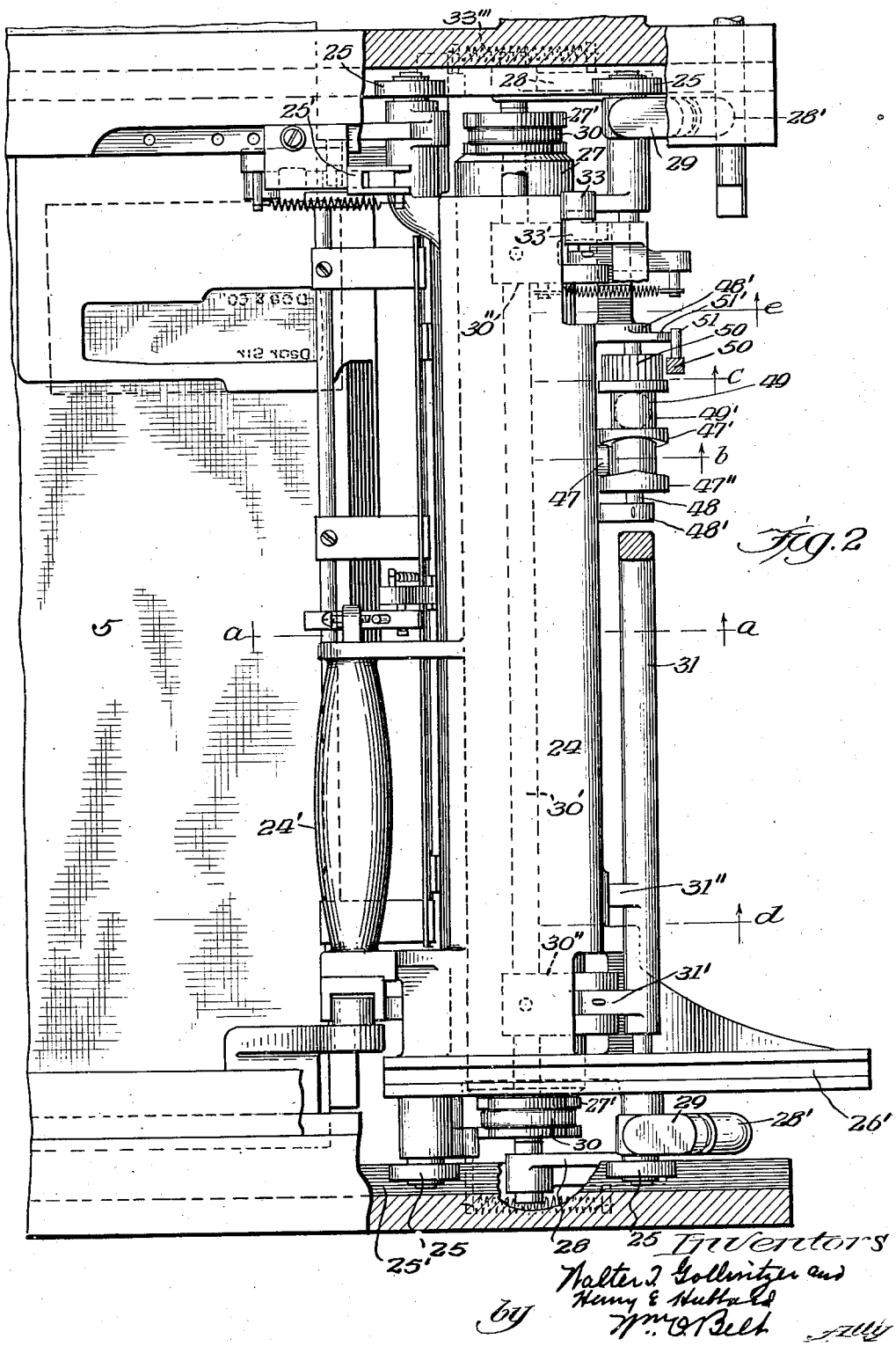


Fig. 2

Inventors
Walter T. Gollwitzer and
Henry E. Huttenlocher
by Wm. O. Belt
Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 3

Fig. 3

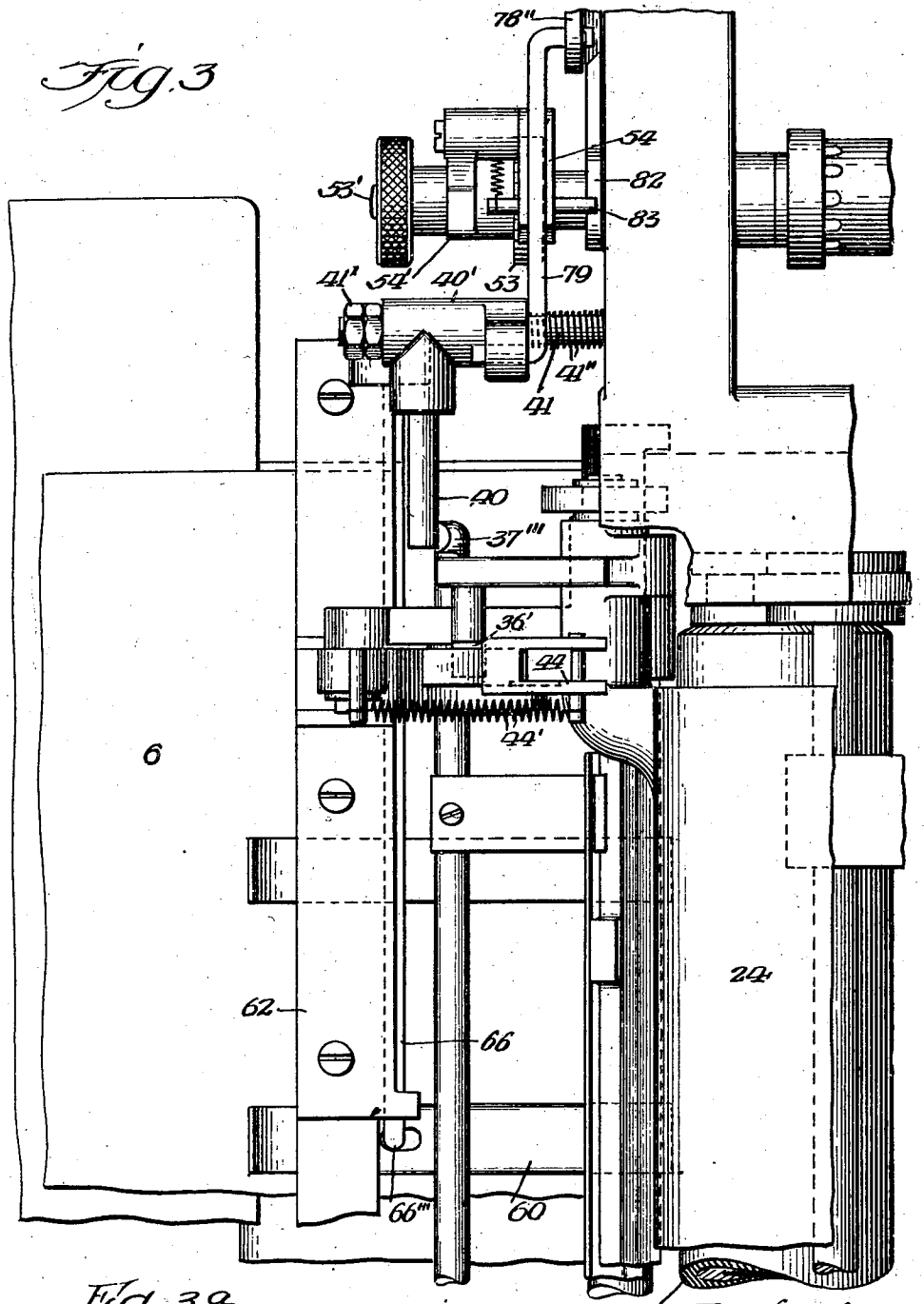
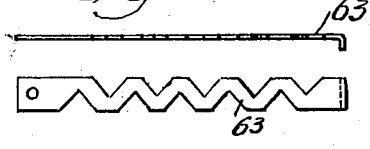


Fig. 3a



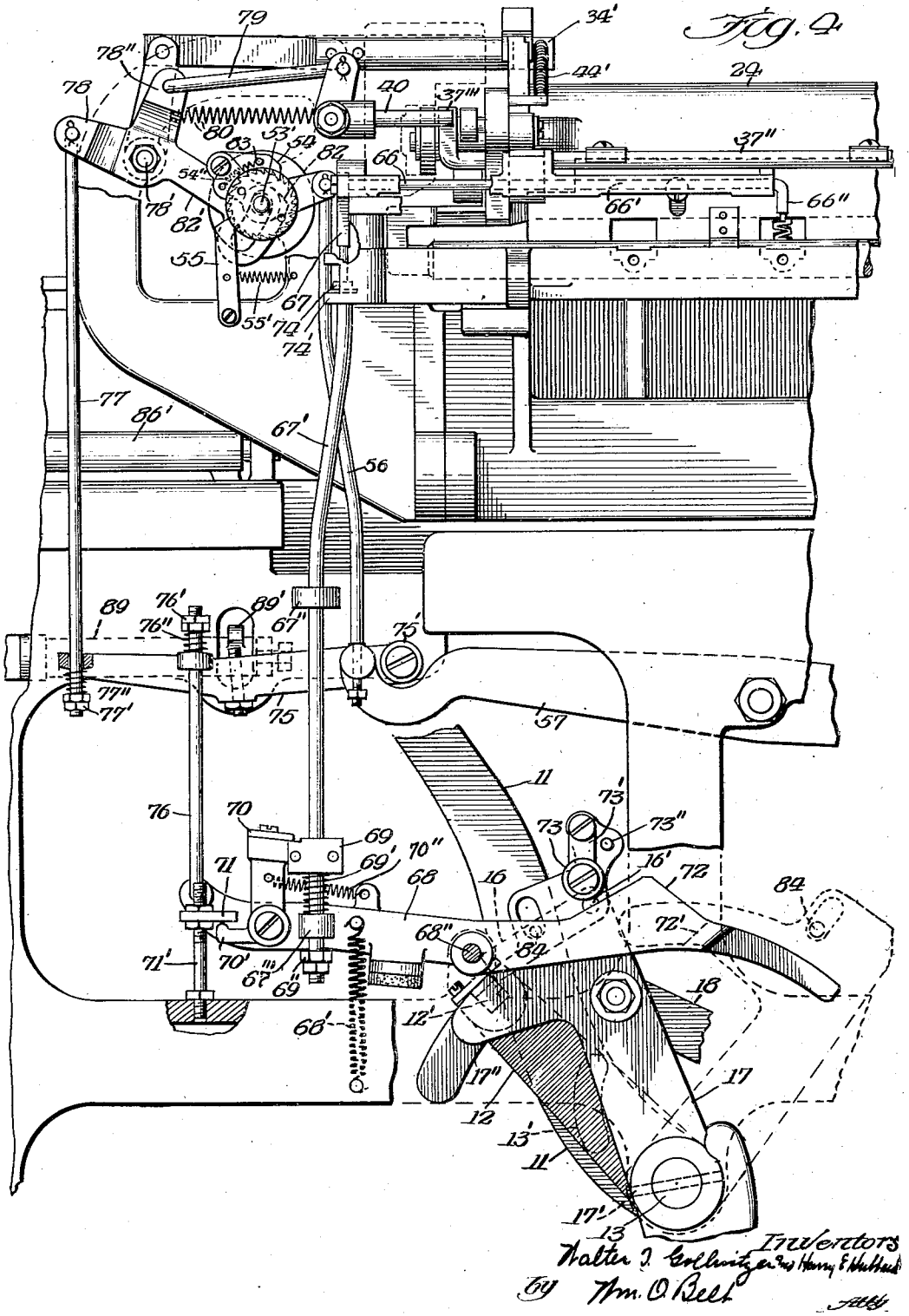
27 Inventors
Walter T. Gollwitzer and
Henry E. Hubbard
by
Wm. O. Belt Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 4

Fig. 4



Inventors
Walter T. Gollwitzer and Harry E. Hulbert
By Wm. O. Beck
Atty.

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 5

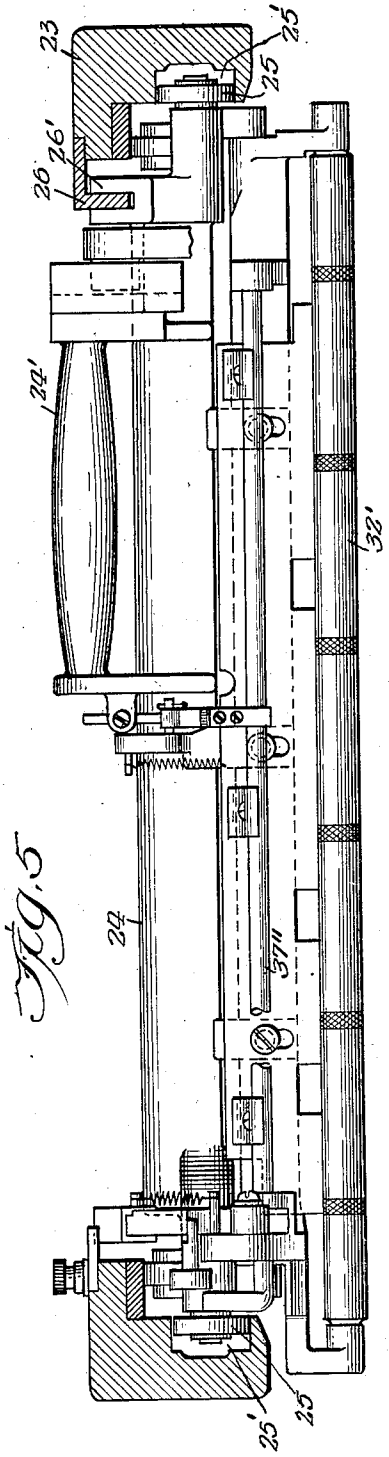


Fig. 5

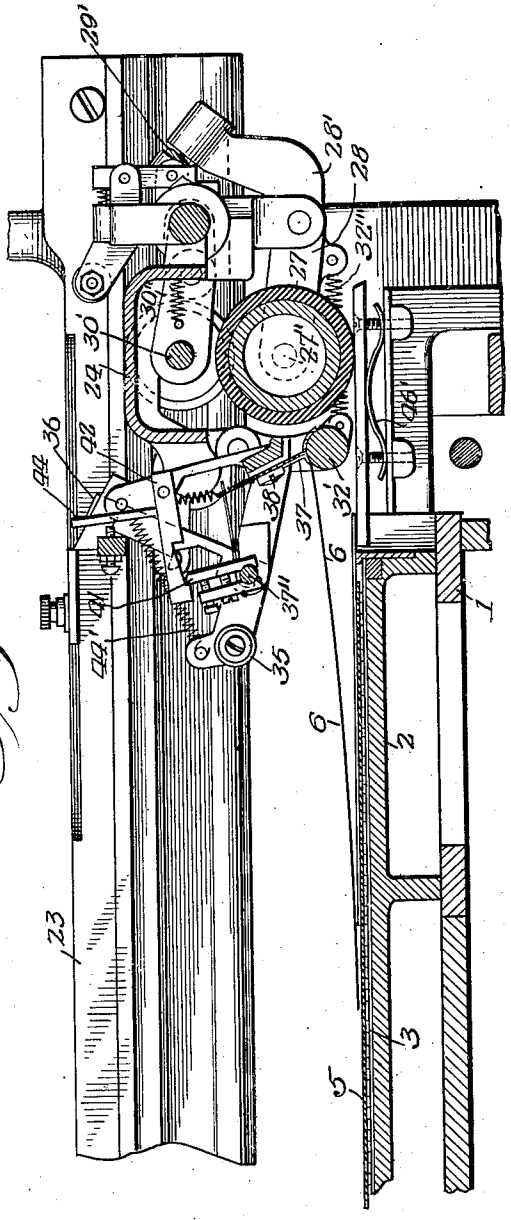


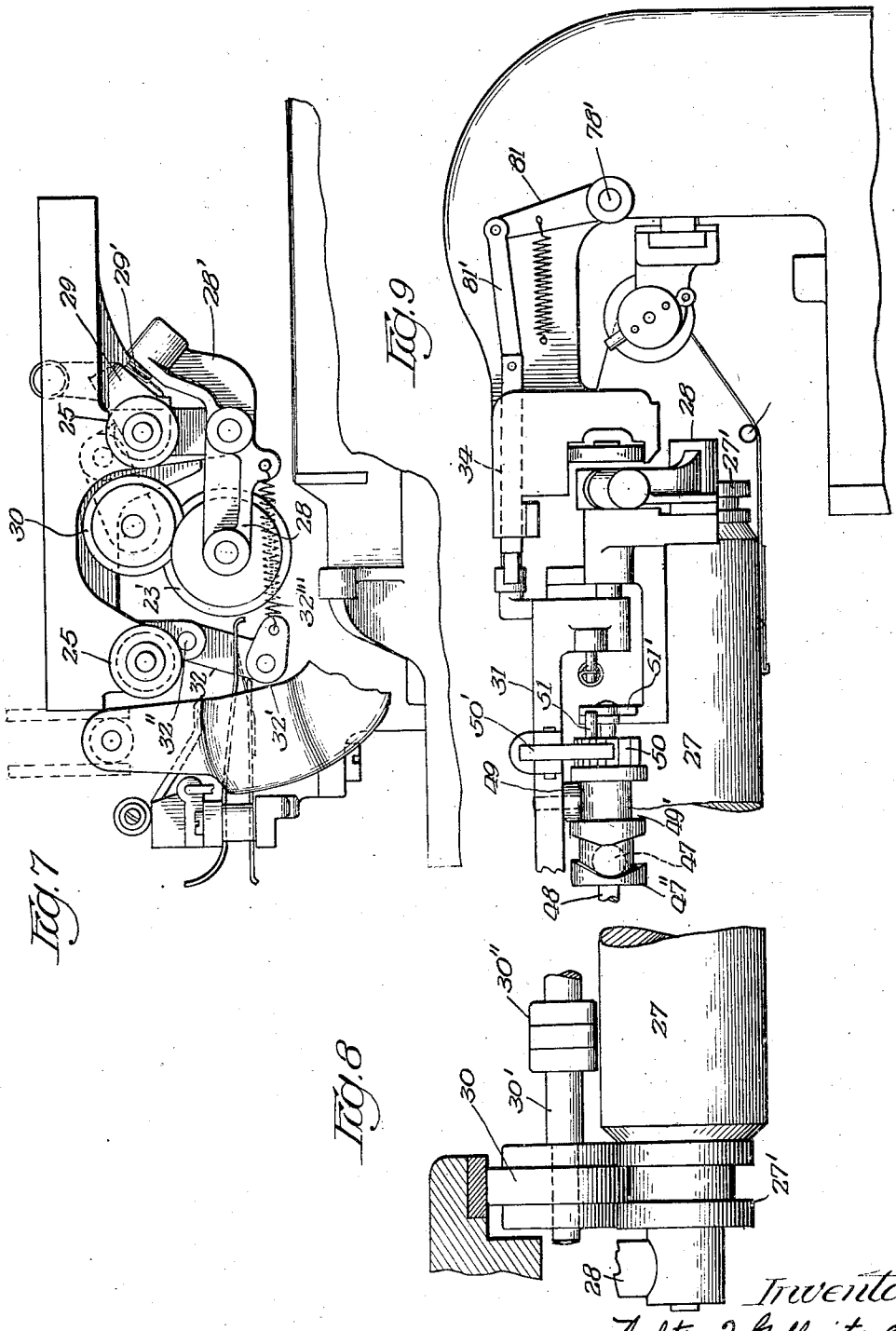
Fig. 6

Inventors
Walter T. Gollwitzer and
Henry G. Hubbard
by Wm. O. Belt Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 6



Inventors
Walter T. Gollwitzer and
By Henry G. Hubbard
Wm. O. Belt Attys

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 7

Fig. 10

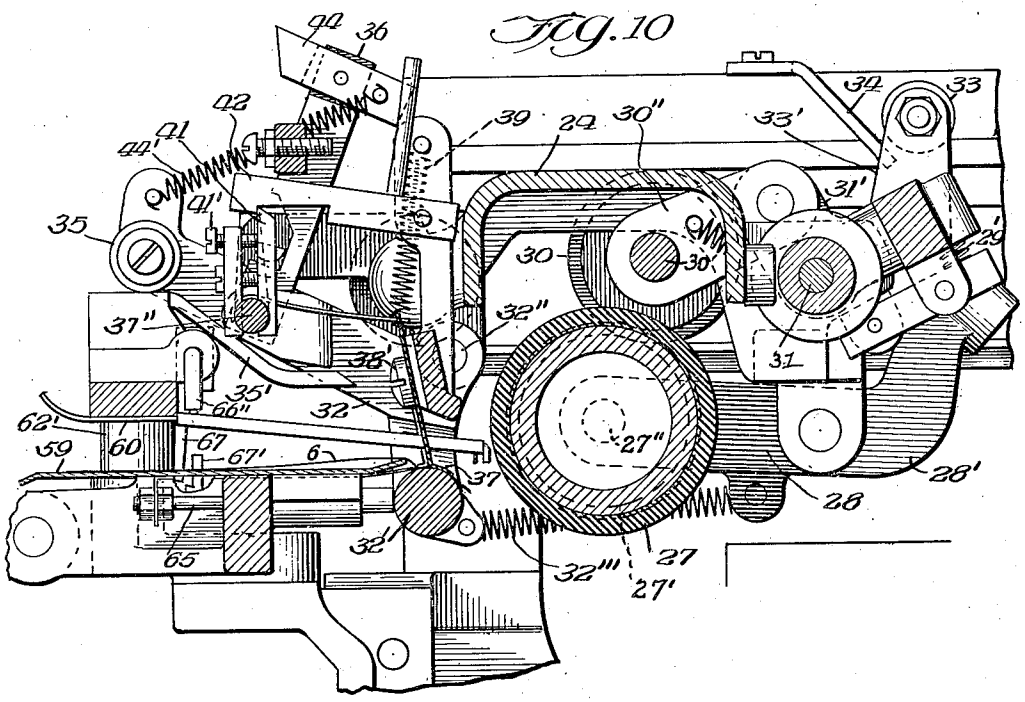
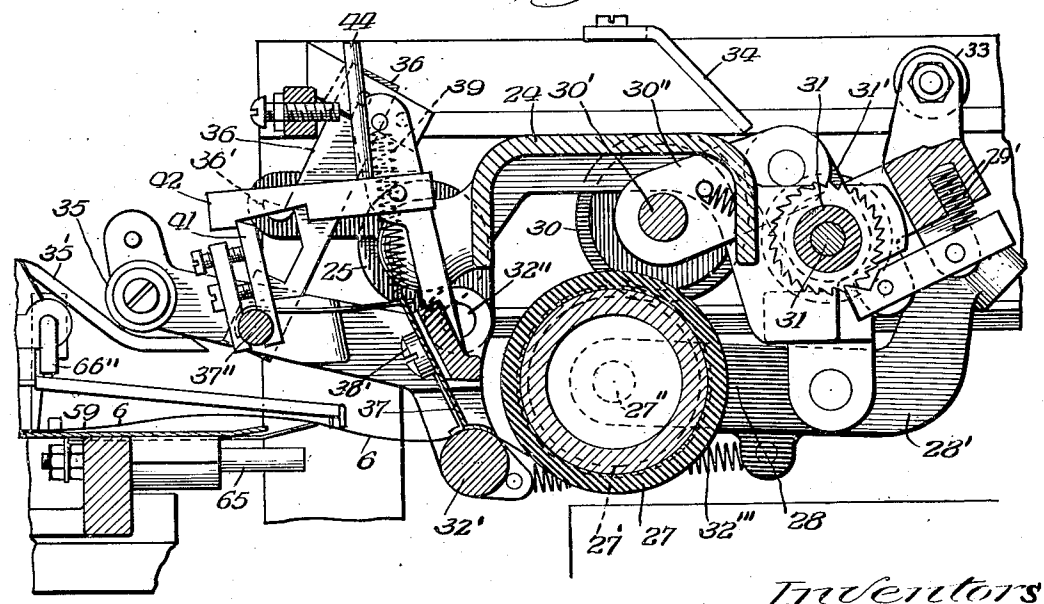


Fig. 11



Inventors
Walter J. Gollwitzer et al
Henry E. Hubbard
by Wm. O. Belt
Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 8

Fig. 12

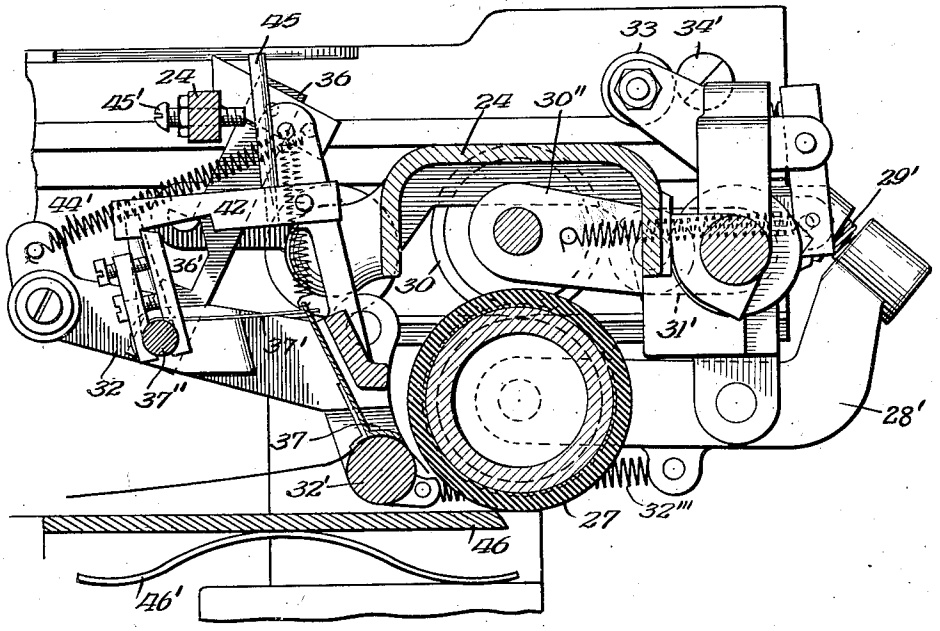
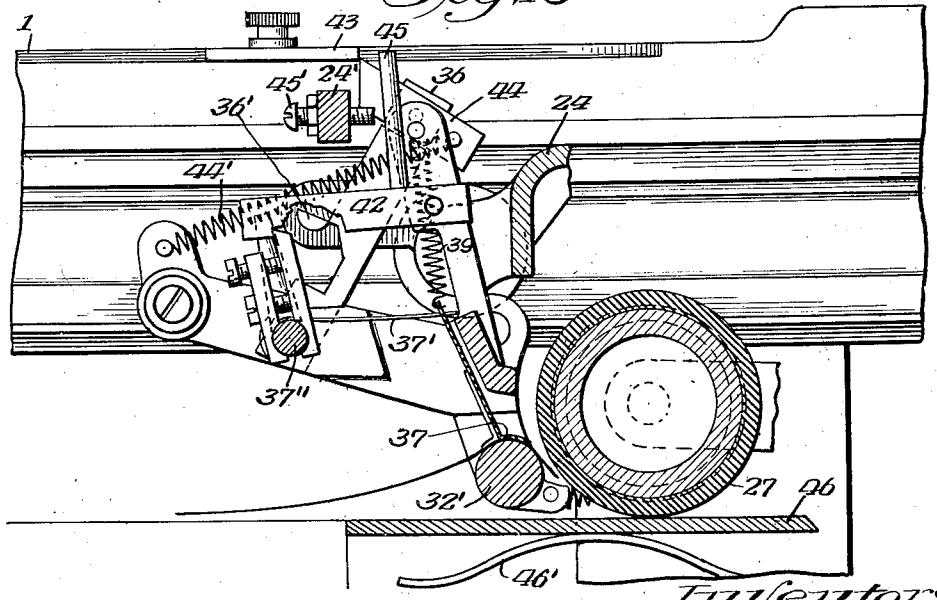


Fig. 13



Inventors
Walter J. Gollwitzer and
Henry E. Hutton
By Wm. O. Beck Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 9

Fig. 14

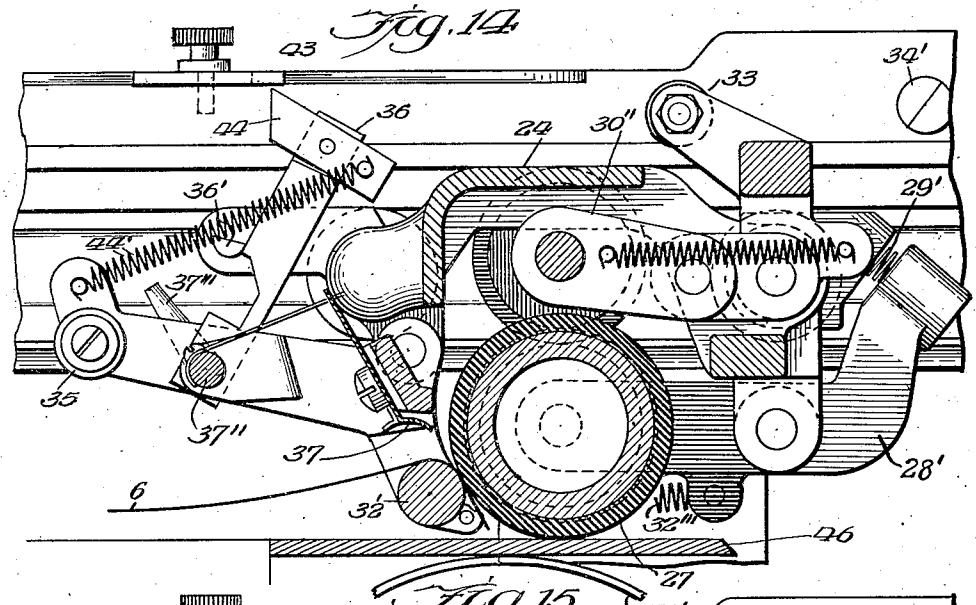
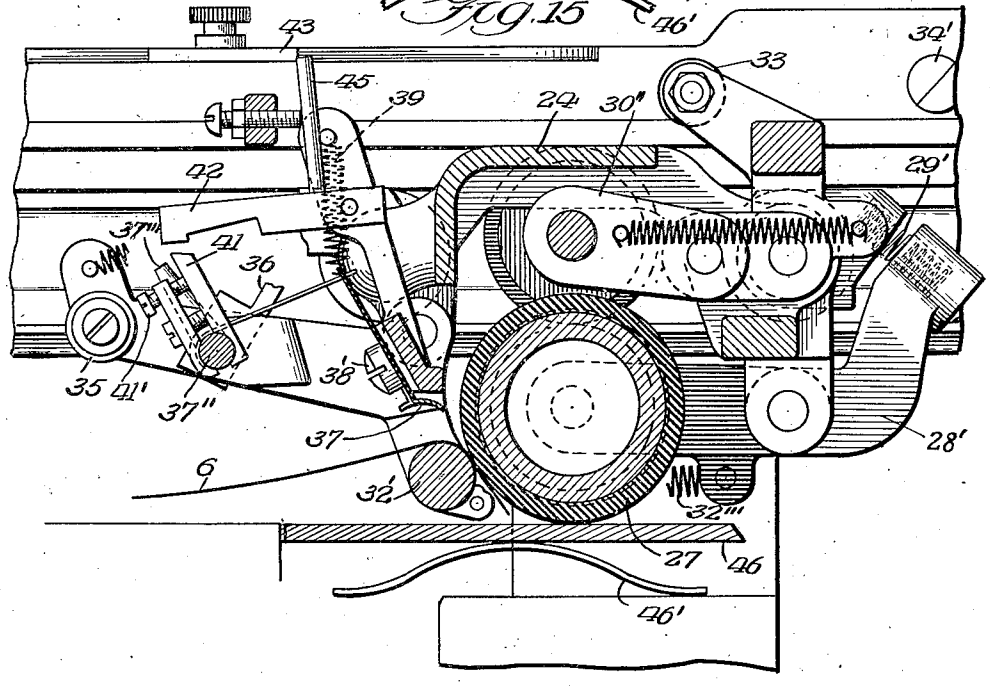


Fig. 15



Inventors
Walter J. Gollwitzer and
Henry E. Hubbard
by Wm. O. Beck Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 10

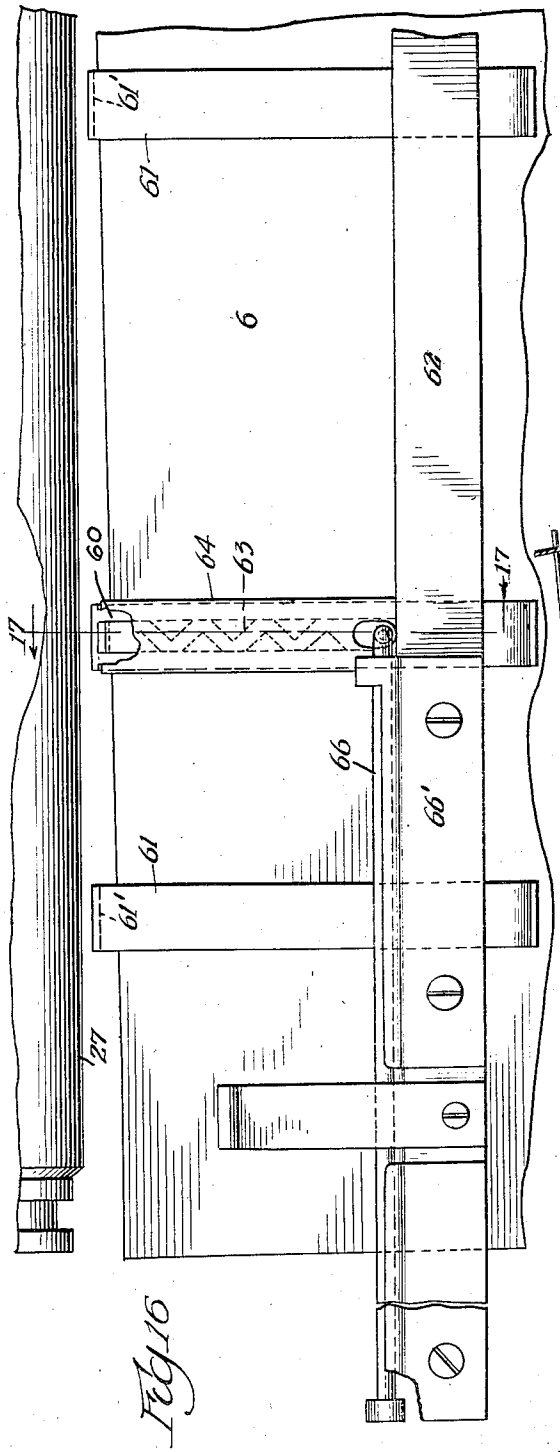


Fig. 16

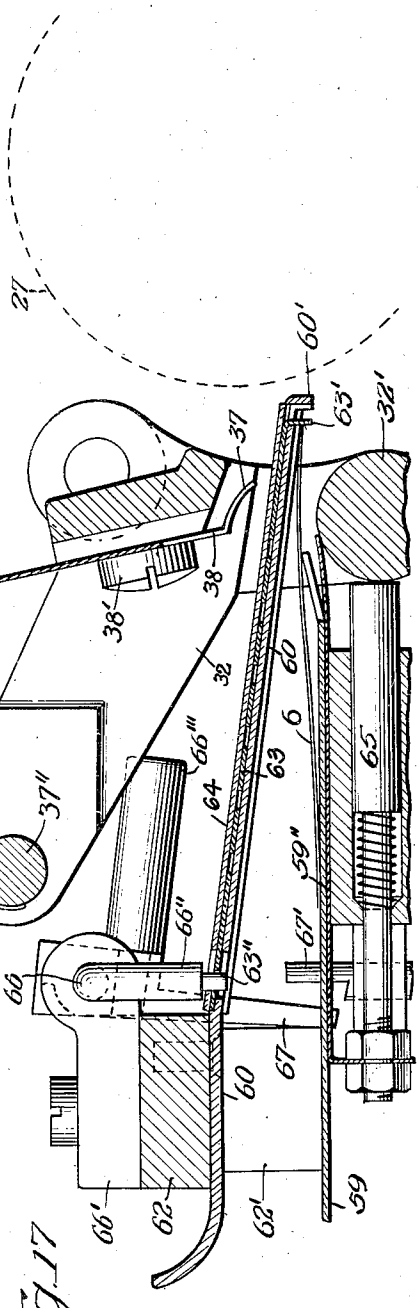


Fig. 17

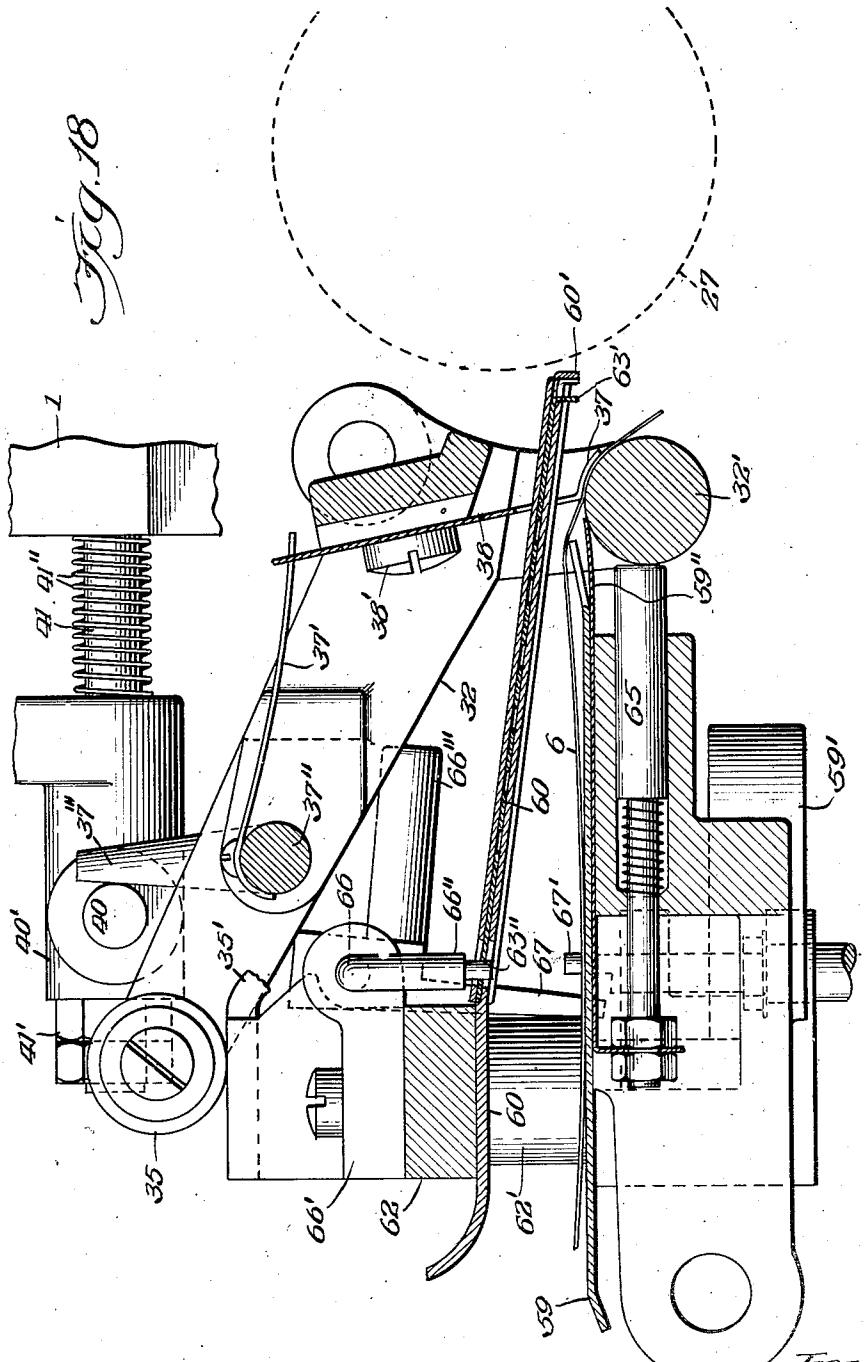
Inventors
Walter T. Gollwitzer et al
By Henry E. Hubbard
Wm. O. Beck Atty.

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 11

Fig. 18

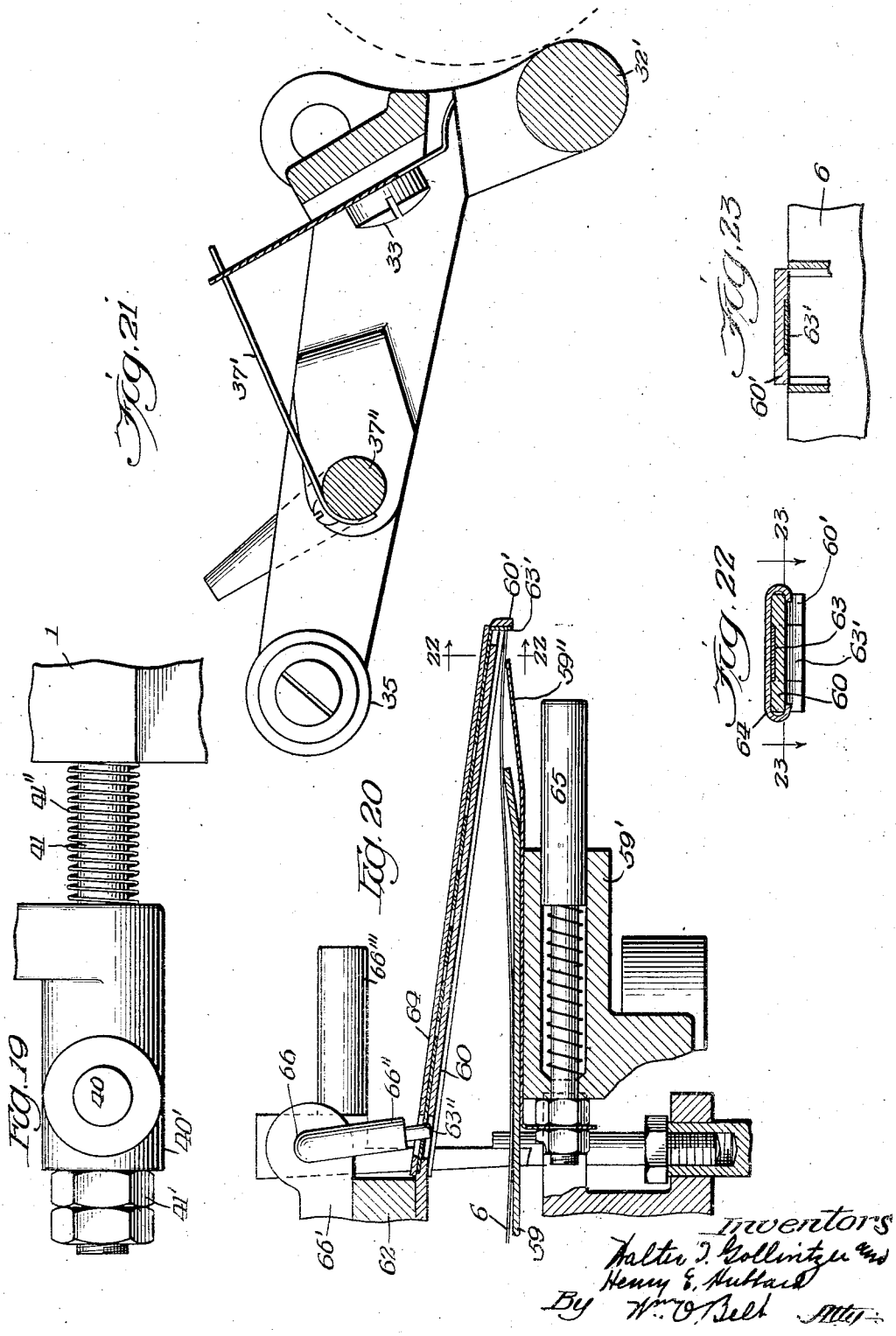


Inventors
Walter T. Gollwitzer and
Henry E. Hubbard
By Wm. O. Belt Atty.

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 12

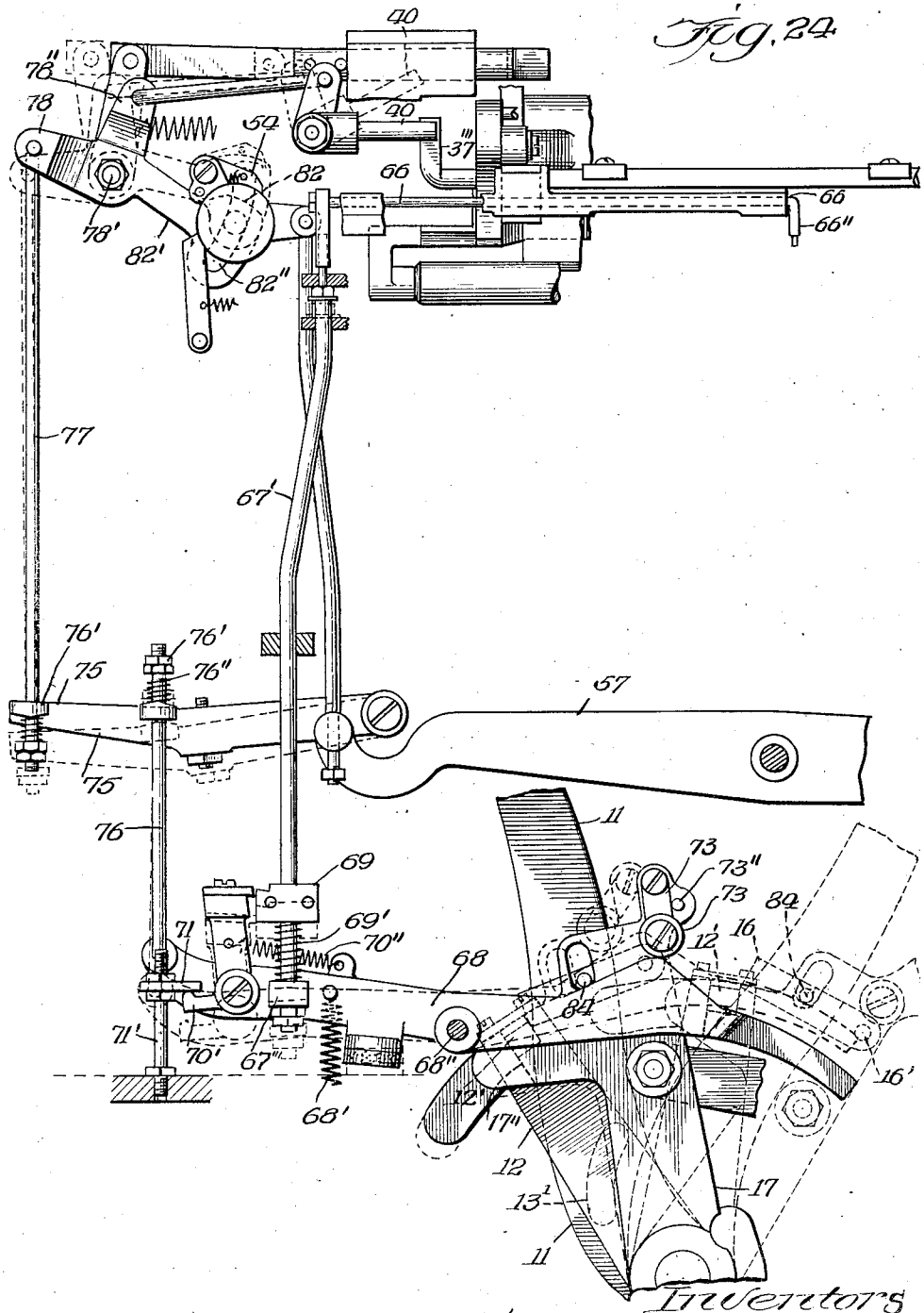


Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 13

Fig. 24



Inventors

Walter T. Gollwitzer and

Henry E. Hubbard

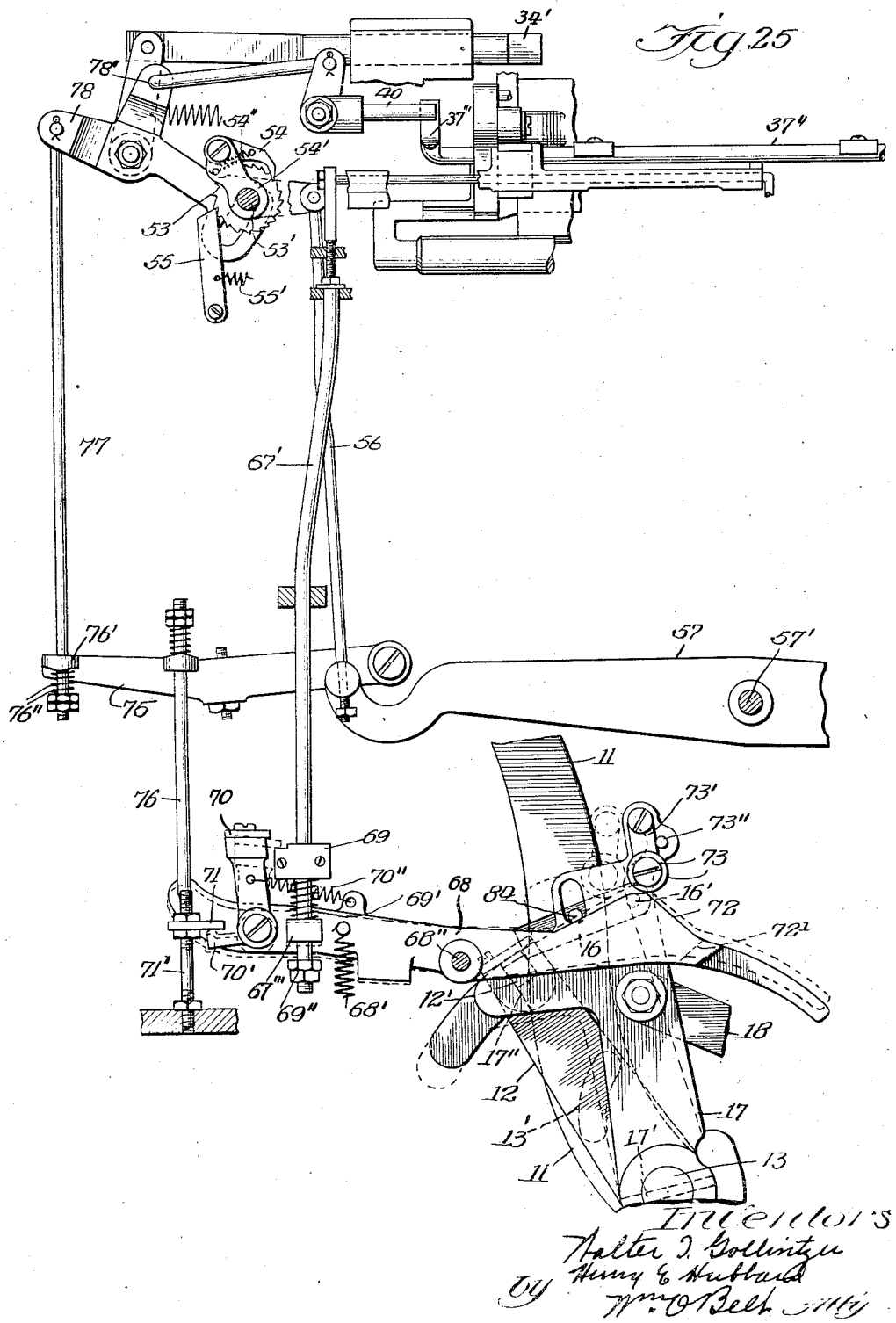
By Wm. O. Belt Atty

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 14

Fig 25

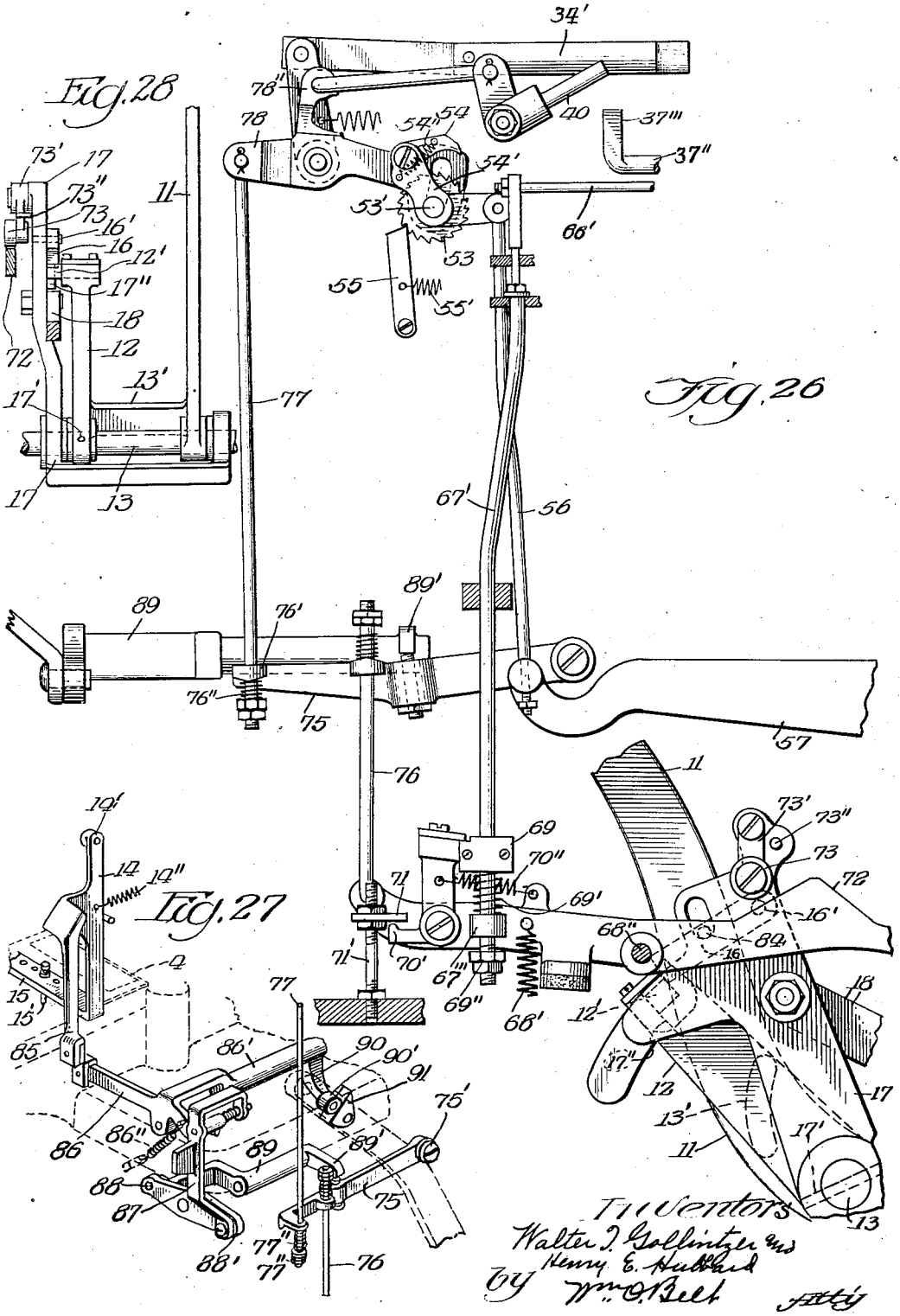


Inventors
Walter T. Gollwitzer
Henry E. Hubbard
Wm. O. Belt
by
Attys

Feb. 3, 1931. W. T. GOLLWITZER ET AL 1,790,661

PRINTING MACHINE

Filed April 12, 1927 15 Sheets-Sheet 15



Patented Feb. 3, 1931 1,790,661

UNITED STATES PATENT OFFICE

WALTER T. GOLLWITZER AND HENRY E. HUBBARD, OF CHICAGO, ILLINOIS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO ADDRESSOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

PRINTING MACHINE

Application filed April 12, 1927. Serial No. 183,048.

A primary object of this invention is to provide a compact and efficient machine of substantial but relatively simple construction for printing, in successive operations, from a single body form and successively changing address forms, selected for printing according to a predetermined classification, to produce individually addressed letters having the same body.

The invention also has for a primary object to simplify and improve a machine of this type so that the several groups of mechanism, including the paper feed, the address feed, the ribbon feed, and the platen will be correlated in a simple manner to operate automatically each with respect to the others and so that all of these groups must work together, and none of them will work to accomplish its intended function if any one becomes inoperative.

More particularly the invention has for its objects to provide simple, efficient and automatic means whereby the address feed, the ribbon feed, and the platen will become ineffective to perform their intended functions if for any reason a sheet of paper is not fed to the machine, or is not properly fed to the machine; whereby a sheet will not be carried to printing position, and the ribbon feed and the platen will not operate to perform their intended functions, without an address device predetermined to be printed; for causing a carriage to carry a sheet over the form to impression position in the machine for every address device predetermined for printing, and performing the impression operation on the return movement of the carriage; for automatically controlling the operation of the several groups of mechanism so that they will properly coordinate to perform or not to perform their respective functions; and generally to make the machine sensitive and positive in operation and so that it can operate at a relatively high rate of speed with all of its parts and groups of mechanism functioning automatically in the manner and for the purpose herein described.

In the accompanying drawings we have illustrated a selected embodiment of the invention and referring thereto;

Fig. 1 is an elevation, partly in section of the front of the machine which is where sheets of paper are fed into the machine.

Fig. 2 is an enlarged plan view, partly in section, showing the carriage just beginning its return movement which is the printing impression movement.

Fig. 3 is a further enlarged view showing a portion of the carriage in initial position and a part of the ribbon mechanism.

Fig. 3*a* shows an edge view and a plan view of the sheet safety finger.

Fig. 4 is an enlarged front elevation, partly in section, showing the operating mechanism at the left of the front of the machine.

Fig. 5 is a front elevation of the carriage showing parts of the frame in section.

Fig. 6 is a transverse sectional view through the carriage on the line *a*—*a* of Fig. 2 showing the parts in position just before the sheet is clamped between the feed roller and the platen roller.

Fig. 7 is a detail elevation of the right end of the carriage in its initial position.

Fig. 8 is a detail view partly in section showing one end of the platen roller.

Fig. 9 is a detail elevation of the rear of the machine showing the right end of the carriage at the end of its forward movement.

Fig. 10 is a transverse sectional view through the carriage on the line *a*—*b* of Fig. 2 showing the parts in initial position with the sheet gripped against the pressure roller.

Fig. 11 is a similar sectional view on the line *a*—*c* of Fig. 2 showing the parts after the carriage has proceeded a short distance from initial position.

Fig. 12 is also a transverse sectional view on the line *a*—*d* of Fig. 2 showing the parts at the limit of the forward movement of the carriage with the platen roller depressed to printing position.

Fig. 13 is a sectional view through the carriage showing the parts just before they are tripped to clamp the sheet between the pressure roller and the platen.

Fig. 14 is a transverse sectional view on the line *a*—*e* of Fig. 2 showing the parts of the carriage in position after the pressure roller has been moved to press the sheet against the platen roller.

Fig. 15 is a section on the line *a*—*a* showing the parts of the carriage in position shown in Fig. 14.

Fig. 16 is a detail plan view showing a sheet improperly positioned, crooked or biased relative to the sheet guides.

Fig. 17 is an enlarged sectional view on the line 17—17 of Fig. 16 and showing a sheet just engaged with the sheet safety finger.

Fig. 18 is a similar view showing some additional parts and the sheet gripped against the feed roll.

Fig. 19 is a detail view of the gripper shaft control rocker.

Fig. 20 is a sectional view showing a position of the sheet and the sheet control finger intermediate of Figs. 17 and 18.

Fig. 21 is an enlarged detail sectional view showing the gripper and its supporting and operating parts.

Fig. 22 is a detail section on the line 22—22 of Fig. 20.

Fig. 23 is a detail section on line 23—23 of Fig. 22.

Figs. 24, 25 and 26 show in different positions the devices for controlling the operation of the address feed, the ribbon feed, the platen and the paper feed on the machine.

Fig. 27 is a detail perspective view of the devices which operate the selector mechanism.

Fig. 28 is a detail view on a reduced scale of a part of the address feed drive devices.

Referring to the drawings 1 designates generally the machine frame and 2 is the bed for a fixed printing form 3, Fig. 6. A printing device 4, Fig. 1, bearing an address or other form is arranged to be supported in printing position adjacent the fixed printing form upon an anvil or auxiliary bed, to print through an ink ribbon 5 upon a sheet 6 which is fed to the machine manually or mechanically, as desired, and then is fed or carried through the machine to printing position by mechanical means hereafter described. The address or changeable printing devices 4 are arranged in a stack in a magazine 7, Fig. 1, and these devices are fed one at a time from the bottom of the stack to printing position adjacent the fixed printing form 3, and are disposed in any suitable manner after the printing operation is completed, for example, by returning them to the storage tray or drawer.

The mechanism for feeding the address devices to printing position need only be shown and described generally in this application because the invention, insofar as it relates to the address device, has to do with the control rather than with the specific construction of the feed mechanism. This mechanism comprises a slide 8, Fig. 1, which operates the selector dogs 9 and the feed dogs 10. A rocker having two arms 11, 12 is pivotally mounted on the shaft 13. Fig 1 to operate the address device feed; the arm 11 is pivotally connected to one end of a link 11′ which is pivotally connected at its other end to the slide 8.

This feed mechanism is arranged to operate regularly and continuously while the machine is in operation to feed address devices one at a time from the bottom of the stack in the magazine to printing position.

It is desired to classify the address devices according to some predetermined classification and for this purpose the devices are provided with removable index tabs. Sometimes it is desired to print only from those address devices in one or more selected classifications, and for this purpose selector mechanism is provided in the machine whereby a complete printing operation is only performed with an address device in the selected classification. All the address devices in the magazine will be fed regularly through the machine, but the machine will only function to perform the printing operation with address devices automatically selected. The address devices must be fed in regular order to maintain their position in the classification system, but a sheet must not be carried into printing position for any address not to be printed because it would not receive an impression, the platen must not be lowered into printing position because it would take ink from the ribbon and smear the next sheet, and the ribbon must not be fed because it would bring too much fresh ribbon into printing position and produce an ununiform impression. Selector mechanism which may be used satisfactorily is covered by Patent No. 1,503,882 and may be described generally as comprising a selector frame 14 which is pivoted at 14′ on the magazine 7, Fig. 1, and a cross bar 15 having a plurality of openings to receive one or more selector pins 15′. The selector pins, one or more, are arranged in the bar in position to co-operate with the tabs on the address devices, and the machine may be set to tab print, which means that all of the address devices with certain tab classification will print, or it may be set to skip tab print, which means that all the address devices will print except those which have certain tab classification. We have shown the machine in the drawings set to skip tab print. At the end of the return movement of the address device feed mechanism, to the left in Fig. 1, which is at the end of the return movement of the carriage and platen to initial position, the selector dogs 9 engage the lowermost address device in the magazine and push it a little to the left. If the machine is set to tab print the selector pin will be positioned to be engaged by the tabs of those

address devices which it is desired to print and when such a device is engaged by the selector dogs 9 its tab will engage the selector pin and swing the selector frame to the left to cause the parts to function, if a sheet has been properly fed to impression position, in a complete printing operation. If the machine is set to skip tab print, the selector pins will be positioned to co-operate with the tabs of all of those address devices which it is desired not to print and these devices, as well as those to be printed, will be fed from the magazine to printing position in regular order, but the selector mechanism will prevent the means for feeding or carrying the sheet to impression position in the machine, the platen roller and the ribbon feed from functioning in their regular manner and the address device not to be printed will be run through the machine just as if it were to be printed, but the operation of the other parts of the machine will be temporarily suspended.

The arms 11 and 12 of the address device feed rocker are connected by a web 13', Figs. 4, 28 and the arm 12 carries a block 12' which is arranged in the path of a pawl 16 pivoted at 16' on a drive rocker 17 which is rigidly secured on the shaft 13 by a pin 17'. An angle link 18, Fig. 1, is pivotally connected at one end to the rocker 17 and at its other end to an arm 18' rigid on a shaft which carries a bevel segment pinion 19' meshing with a bevel segment gear 20. Power is communicated to the machine through a drive rod 21 which is pivotally connected to one arm 21' of a bell crank lever whose hub 21'' is loosely mounted on the fixed shaft 20', Fig. 1. The other arm 22 of the bell crank lever projects upward and is arranged to be engaged by a pawl 22' on the lever 23 which is pivotally mounted on the fixed shaft 20' and is connected at its upper end to the carriage frame 24 to reciprocate the carriage. The pivot end of the lever 23 carries the segment gear 20. When the pawl 22' is engaged with the lever arm 22 motion will be communicated to the carriage drive lever 23, to the drive rocker 17 and to the printing device feed rocker 11, 12, and also to other parts of the machine to be described. When the pawl 22' is disengaged from the lever arm 22 the machine will be at rest except for the bell crank lever 21', 22 and other parts on the power side of the pawl 22'. The angle link 18 rocks the drive rocker 17 and the pawl 16' engages the block 12', on the movement of the drive rocker to the left, Figs. 1, 4, and swings the address device feed rocker to the left. The drive rocker is offset at 17'' to form a projection which engages the block 12' on the rearward movement of the drive rocker to move the printing device feed rocker to the right, Figs. 1–4, and during the latter movement an address device is fed by the feed dogs 10 forward from beneath the stack to printing position.

The carriage 24 is provided with carrying rollers 25 which travel in ways 25' in the frame of the machine and this carriage may be reciprocated automatically by the drive lever 23, as before described, or manually by means of the handle 24'. A flange 26 on the frame of the machine projects into an elongated groove 26' in the top of the carriage to maintain the carriage in proper position in its travel, Figs. 1, 2. A platen roller 27 is provided at its ends with grooved rollers 27', Figs. 2, 8 all carried by a shaft 27'', Fig. 6 which is mounted to slide axially in the arms of supporting rockers, Figs. 2, 7, 9, pivotally mounted on the carriage frame at each end thereof. The other arms 28' of these rockers are arranged in opposition to fixed stops 29 on the carriage frame, Fig. 7, and compression springs 29' are interposed between the free ends of the arms 28' and the stops 29. The platen is normally held elevated out of impression position by the springs 29' which are attached to the rocker arms 28', Fig. 7. Flanged thrust rollers 30, Figs. 2, 8, engage the grooved rollers 27' on the platen roller and are carried by a shaft 30' which is connected by toggle links 30'' with toggle arms 31' on the platen roller rocker 31. This rocker is pivotally mounted in the carriage frame and its arms 31' engage links 30'' to move shaft 30' and its flanged rollers 30 back and forth in a substantially horizontal plane from the position shown in Fig. 10 where the platen roller is elevated above the printing form, to the position shown in Fig. 12, where the platen roller is in position to operatively engage and make an impression from the printing form. A stop 31'', Fig. 2, has arms projecting above and below the rocker 31 to engage the carriage frame and limit the movement of the rocker.

A rock frame 32 carries the feed roller 32' and is pivoted at 32'' on the carriage frame, Fig. 7. The roller 33 is mounted on an arm 33' on the platen roller rocker 31, Figs. 2, 10 and this roller is adapted to engage a cam 34 fastened on the main frame at a position corresponding to the initial position of the carriage, and also to engage a stop 34' in the form of a slide bolt on the main frame at a position corresponding to the forward limit of travel of the carriage, Fig. 12. In the forward travel of the platen roller over the form from initial position it is held in elevated position, Fig. 10, but at the limit of this forward travel the roller 33 engages the stops 34', Fig. 12, straightens the toggles 30'', 31', shifts the thrust rollers 30 to the left, Fig. 10, and depresses the platen into impression position, Fig. 12. The platen roller remains in this impression position during the printing operation on the return travel of the carriage and

until the roller 33 engages the cam 34, Fig. 10, and breaks the toggles, retracts the thrust rollers 30 and permits the springs 29′ to lift the platen roller out of impression position, Fig. 10.

A spring 32‴ at each end of the carriage frame is connected to the platen roll rocker arms 28 and also to the feed roller rock frame 32, Fig. 10, and these springs tend to pull the feed roller 32′ into operative engagement with the platen roller, with the sheet 6 clamped therebetween, Fig. 14. But it is desired to hold the feed roller away from the platen roller during the entire forward movement of the carriage while the carriage is carrying a sheet into position above the form. It will be understood that it is on the return movement of the carriage that the sheet is clamped between the feed roller and the platen roller and is fed by the platen roller by frictional contact therewith during the printing operation.

A roller 35 on the feed roller rock frame 32 travels up a fixed cam 35′ on the frame of the machine at the initial position of the carriage which is when it is at the front of the machine, looking at Fig. 1 and this engagement of the roller with the cam swings the feed roller rock frame and carries the feed roller 32′ away from the platen roller 27, Fig. 10. As the carriage proceeds on its forward travel and the roller 35 rides down the cam 35′ from the position shown in Fig. 10 to that shown in Fig. 11 the springs 32‴ pull the feed roller 32′ towards the platen roller, but contact of the feed roller with the platen roller is prevented at this time by engagement of the latch pawl 36 with the stop 36′ on the carriage frame, which occurs at or about the time the roller reaches the bottom of the cam 35′, Fig. 11. At this time the sheet 6 is clamped against the feed roller 32′, by the gripper 37, which is carried by the free ends of spring arms 37′ secured on the gripper shaft 37″ which is mounted in the feed roller rock frame 32, Fig. 18. In the embodiment of the invention herein shown, there is one elongated gripper 37 and there are three spring arms 37′, the purpose of using several spring arms being to apply the spring pressure evenly throughout the length of the gripper upon the sheet. The gripper has slots 38 to receive the screws 38′ by which the gripper is guided in its up and down movement on the feed roller rock frame.

A spring 39 attached at one end to the feed roller rock frame and at its other end to the gripper tends to hold the gripper normally in elevated position, Fig. 15. One end of the gripper shaft 37″ is bent at right angles to form a lever arm 37‴, which is arranged to engage a pin 40, Figs. 3, 18, in the gripper shaft control rocker 40′, which is mounted on the pin 41 rigid on the main frame of the machine and between the adjusting nuts 41′ and the compression spring 41″. The spring 39 holds the lever arm 37‴ in inclined position, Figs. 14, 15, during the return movement of the carriage and when the carriage reaches the limit of its return movement the lever arm 37‴ engages the pin 40 and the gripper shaft 37″ is swung to depress the gripper and push the sheet from the position shown in Fig. 17 to clamped position against the feed roller, Fig. 18. The carriage is now at its initial position and the sheet is clamped by the gripper against the feed roller and as the carriage proceeds on its forward travel the sheet is carried across the form by the gripper and the feed roller to the limit of the forward movement of the carriage. The gripper is held in clamped position during the forward travel of the carriage by an adjustable arm 41 rigidly mounted on the gripper shaft 37″, Fig. 10, which is engaged with a pawl 42 pivotally mounted on the feed roller rock frame 32. The arm 41 is capable of being adjusted by the screws 41′ on the gripper shaft 32′ to vary the clamping pressure of the gripper on the sheet.

The sheet may be fed manually or automatically to the position shown in Fig. 17 while the carriage is returning to initial position and this sheet is clamped by the gripper against the feed roller as the carriage reaches the end of its return movement. Then the carriage carries the sheet across the printing form to the limit of its forward movement and also for a limited distance on its return movement depending upon the width of the margin desired at the left edge of the sheet. This is determined by a margin stop or gauge 43 which is adjustably mounted on the main frame of the machine, Fig. 13. A release pawl 44 is pivotally mounted on the latch pawl 36 and is held by spring 44′ in position to engage the margin gauge stop 43 on the return movement of the carriage. On the forward movement of the carriage the pawl 44 rides under the gauge stop 43. The spring 44′ also serves to hold the latch pawl 36 in engagement with the pin 36′. When the pawl 44 engages the gauge stop 43 the latch pawl 36 will be disengaged from the pin 36′, Figs. 13, 14, permitting the feed roller rock frame to swing on its pivot, lowering the pawl 44 to pass beneath the stop guide and carrying the feed roller into operative relation to the platen roller to clamp the sheet therebetween.

At the time the sheet is clamped between the feed roller and the platen roller the gripper is released from engagement with the sheet. This is accomplished by a pin 45 rigidly mounted on the pawl 42, Figs. 12, 13 which is arranged to engage an adjustable screw stop 45′ mounted on the carriage frame. When the latch pawl 36 is disengaged

from the pin 36′ to release the feed roller rock frame and permit it to swing the feed roller into operative relation to the platen roller the pin 45 is swung into engagement with the screw stop 45′ to release the pawl 42 from the arm 41, thus permitting the spring 39 to lift the gripper. This disengagement of the gripper occurs as nearly as possible simultaneously with the clamping of the sheet by the feed roller against the platen. When the carriage returns to initial position the arm 37‴ engages the pin 40 and lowers the gripper to grip the next sheet against the feed roller.

Provision is made on the machine for a margin of maximum width, but ordinarily a narrower margin will be used and consequently the carriage must travel a limited distance determined by the position of the margin stop before the sheet is clamped between the feed roller and the platen roller. But the platen roller is lowered into impression position at the end of the forward movement of the carriage and during this limited travel to the margin gauge the sheet is being backed over the form and the platen roller rolls on the pressure plate 46 which is provided on the main frame of the machine alongside of the printing form to receive the platen roller throughout the travel of the carriage for the maximum margin width, Figs. 12–15. Any suitable means may be employed for holding the pressure plate yieldingly in position to receive the platen roller, such as a spring 46′. The function of the pressure plate is to cause the platen roller to revolve so that it will be in revolution at the time the sheet is clamped against it by the feed roller; and thereafter on the continuation of the return movement of the carriage the platen roller travels over the sheet and feeds the sheet under the platen roller and makes a printing impression on the sheet, the feed roller 32′ functioning as a pressure roller to clamp the sheet against the platen roller so that the latter may feed the sheet as the carriage proceeds on its return travel by frictional contact with the sheet. As the carriage travels in its forward movement carrying a new sheet over the form automatic means (not shown) may be provided to remove the printed sheet from the machine.

As the invention is embodied in this machine the platen roller travels lengthwise of the lines of type in the form and it is desirable to vary the position of the surface of the platen roller relative to the form to prevent the lines of type from wearing grooves in the surface of the platen roller. In Patent No. 1,623,396, April 5, 1927, provision is made for shifting the platen roller and its carriage axially of the platen roller, but in the present machine the platen roller is shifted relative to its carriage. The grooved rollers 27′ are rigid with the platen roller on its shaft 27″ and this shaft is freely movable in the supporting rocker arms 28, Figs. 2, 9. The toggle links 30″ on the shaft 30′ carrying the flanged rollers 30 are engaged with the toggle arms 31′ on the platen roll rocker. The flanged rollers 30 engage the grooved rollers 27′ and a longitudinal movement of the platen roll rocker 31 will cause an axial movement of the platen roller. This longitudinal movement of the platen roll rocker is accomplished by a roller 47 on the carriage frame which operates in a closed groove cam 47′ formed in a sleeve 47″ which is loosely mounted on a shaft 48 supported in lugs 48′ projecting from the carriage frame. A roller 49 on the platen roll rocker is arranged in a groove 49′ on the sleeve 47″ and the endwise movement of the sleeve produced by the engagement of the roller 47 with the cam groove 47′ will be communicated through the roller 49 to the platen roll rocker and thence through the toggle arms 31′ and links 30″ to the shaft 30′ and thence through the flange rollers 30 and the grooved rollers 37′ to the platen roller. The cam sleeve 47″ is revolved intermittently by a ratchet 50 on the sleeve and a pawl 50′ on the rocker. The platen roll rocker functions to raise and lower the platen roller and in its rocking movement the pawl and ratchet function to feed the sleeve intermittently. A pin 51 on the pawl 50′ rides on a cam 51′ rigid with the carriage frame and the cam is shaped to permit the pawl to engage the ratchet only during a portion of the rocking movement or stroke of the platen rocker to confine the revolving movement of the cam sleeve 47″ to one tooth of the ratchet 50 which is less than the full movement of the rocker. Thus the platen roller is shifted axially back and forth during the operation of the machine and this serves to spread the wear on the roller throughout the surface thereof.

The ribbon 5 is mounted on a tension spool 52 and is stretched across the form and engaged with a takeup spool 52′, Fig. 1, both spools being suitably mounted in the machine. A ratchet 53 is mounted on a stub shaft 53′ which is loosely supported in the frame of the machine to drive the takeup spool. Fig. 25. A feed pawl 54 is pivoted on one arm of a rocker 54′ which is loosely mounted on the stub shaft 53′. A locking pawl 55 is pivoted on the frame of the machine, Fig. 4, and engages the ratchet to prevent reverse movement of the takeup spool. A spring 54″ normally holds the feed pawl in engagement with the ratchet and a spring 55′ normally holds the locking pawl in engagement with the ratchet. A rod 56 is connected at its upper end to another arm of the rocker 54′ and at its lower end to one end of a lever 57 which is pivoted at 57′ on the frame of the machine. The other end of the lever 57 is apertured to receive a rod 58 which is engaged at its lower end with an arm 58′

rigid with the segment pinion 19′, Fig. 1. The arm 58′ causes the rod 58 to rock the lever 57 and impart a feeding movement to the feed pawl 52′. A spring 58″ on the rod 58 provides for a yielding engagement between the rod and the lever and acts as a safety so that the ribbon will not be torn if the ribbon feed is not stopped immediately when it has been exhausted from the supply spool 52. In other words the ribbon has reached the end of its feed from the supply spool 52 and is tautly held between the supply spool and the takeup spool, the rod 58 can continue its movement but without actuating lever 57 and therefore the takeup spool will not be fed further.

A feeding shelf 59 is mounted on a bracket 59′ which is carried by the frame of the machine and beneath this shelf projects a spring finger 59″, Figs. 18, 20. In the embodiment of the machine illustrated there is an intermediate guide finger 60 and two outside guide fingers 61, Fig. 16. These guide fingers are riveted to a bar 62 which is supported at its ends by spacer posts 62′ on the bracket 59′. Fig. 18. The outer ends of the guide fingers are bent downward at 60′, 61′, to be engaged by the sheet 6, Fig. 20. The middle guide finger 60, Fig. 22, is recessed longitudinally to receive a safety finger 63 which is arranged to slide lengthwise. A cover plate 64 is crimped over the middle guide finger to hold the safety finger in the recess in the guide finger. The safety finger is zigzag, Fig. 16, in shape to make it more flexible and to prevent it from bearing heavily against the guide finger or its cover. It is essential that this finger move with the greatest freedom since it is operated by engagement of the edge of the sheet therewith and which by a very slight movement actuates the important controls of the machine. The down-turned end 60′ of the guide finger 60 is also recessed to accommodate the downturned end 63′ of the safety finger. The sheet is fed to the machine onto the feeding shelf and is guided by the spring fingers 59″ into engagement first with the downturned end of the safety finger and then with the downturned ends of the guide fingers, the safety finger moving with the sheet after the latter engages therewith.

The spring fingers 59″ project beyond the feeding shelf 59, as shown in Fig. 20, when the sheet is fed to the machine. It is essential to move these spring fingers out of the way of the feed roller when the carriage is finishing its return travel and is picking up a sheet, so that they will not interfere with the operation of the gripper which disengages the sheet from the guide fingers and curves it about a portion of the feed roller. The spring fingers 59″ extend beneath the shelf and are attached to spring pressed plungers 65, Fig. 17, which are arranged in the path of the feed roller and are adapted to be pushed back as the carriage approaches its initial position to retract the spring fingers from forward position, Fig. 20, to retracted position, Figs. 17, 18.

The safety finger controls the normal functions of the machine,—the operation of the gripper, the lowering of the platen roller, the feeding of the ink ribbon, and the feeding of the address device. The safety finger is adapted to be moved only a short distance by engagement of the sheet therewith and it is this movement which controls the operations referred to. A shaft 66 is mounted in a casting 66′ which is fastened on the guide finger support bar 62, Fig. 16, and this shaft has a downturned end 66″, Fig. 17, which engages an opening 63″ in the safety finger. A latch pawl 67 is rigidly mounted on the other end of the shaft 66 and is arranged to engage the end of a control rod 67′, which is guided in a lug 67″ Fig. 4 on the frame of the machine. The lower end of this rod also passes through a lug 67‴ on the throwout lever 68, Fig. 4, and a spring 68′ is fastened to this lever and to the frame of the machine to pull the lever downward. A block 69 is rigidly fastened in adjusted position on the control rod 67′, a spring 69′ is arranged on the rod between the block 69 and the lug 67‴, and nuts 69″ are adjustably arranged on the lower end of the rod to engage the lug 67‴. A safety trip pawl 70 is pivotally mounted on the throwout lever 68 and it has an arm 70′ which engages a trip blade 71 adjustably mounted on the post 71′ which is secured in rigid position on the main frame of the machine. A spring 70″ is fastened to the pawl 70 and to the throwout lever to pull the pawl into position for engagement with the block 69. The lever 68 is pivoted at 68″ on the frame of the machine and it extends rearward from its pivot and is provided with a cam 72 and an offset which forms a cam shoulder 72′. A roller 73 is carried by a link 73′ which is pivoted to swing on the rocker 17 and is limited in its movement to the right, Fig. 4, by the pin 73″. The roller 73 is arranged to travel on the cam 72 and to cause the throwout lever to swing on its pivot 68″. The rocker 17 rocks with the travel of the carriage and the parts are shown in Fig. 4 in the initial position of the carriage, Fig. 10, with a sheet engaged by the gripper. On the forward movement of the carriage and corresponding movement of the rocker 17 to the right, Fig. 4, the roller 73 will ride idly over the cam 72 without operating the throwout lever because the link 73′ carrying the roller swings freely to the left. On the return movement of the carriage and the movement of the rocker 17 to the left, Fig. 4, this roller is held by the pin 73″ against the cam 72 and swings the throwout lever on its pivot to disengage the pawl

70 from the block 69, as indicated in full lines in Fig. 25. At this time, and with the carriage on its return movement and a sheet of paper clamped between the feed roller and the platen roller and the pawl 70 disengaged from the block 69 the control rod 67′ is free to move upward because by this time the latch pawl 67 has swung to the left, Fig. 17, and retracted the safety finger to normal position, as there shown. This retraction of the latch pawl is effected by a weight 66‴ on the shaft 66. As the carriage approaches initial position the sheet is fed over the shelf into a position where it will engage the safety finger and swing the shaft 66 to carry the latch pawl 67 into operative relation to the control rod 67′. At this time the control rod is held in lowered position by the safety trip pawl 70 and the roller 73 is just about to ride over the cam 72 from right to left in Fig. 4. As the roller travels on the cam the throwout lever is rocked on its pivot which causes the arm 70′ to engage the trip blade 71 and release the safety trip pawl from the block, Fig. 25. Then the spring 69′ tends to thrust the control rod 67′ upward, but by this time the latch pawl has been swung into position to be engaged by the control rod and prevent the upward movement of the control rod, Fig. 20. The block 69 is then held in position so that it may be engaged by the safety trip pawl when the roller 73 travels over the high point of the cam and permits the spring 68′ to rock the throwout lever on its pivot. The safety trip pawl by engaging the block holds the lever against the tension of the spring 68′. A collar 74 rigid on the control rod 67′ engages the stop 74′ on the frame of the machine and limits the downward movement of the control rod. An arm 75 is pivoted at 75′ on the frame of the machine and a rod 76 connected at one end to one end of the throwout lever 68 passes through a lug on the arm and is provided with a lock nut 76′. A buffer spring 76″ is arranged between the lock nut and the lug. A rod 77 passes through the outer end of the arm 75 and is provided with a lock nut 77′ on its lower end. A buffer spring 77″ is arranged on the rod between the lock nut and the arm 75. The upper end of the rod 77 is connected to one arm 78 of a bell crank which is rigidly mounted on a shaft 78′ supported in the frame of the machine. The other arm 78″ of the bell crank is connected by a rod 79 to the gripper shaft control rocker 40′, Figs. 3, 4 to throw the pin 40 into or out of operative relation to the lever arm 37‴ on the gripper shaft 37″. In Fig. 4 the carriage is approaching initial position on its return stroke, about as shown in Fig. 11, and the roller 35 is about to travel up the cam 35′ to the position shown in Fig. 10. The gripper is now held in elevated position by the spring 39. With the safety trip pawl 70 engaged with the block 69 and holding the throwout lever in elevated position, the spring 80 swings the bell crank lever 78, 78″ to the right, Fig. 4, and rocks the gripper shaft control rocker pin 40 into position to be engaged by the lever arm 37‴ on the gripper shaft as the carriage reaches initial position. Thereupon the gripper shaft is rocked and the gripper is lowered into gripping engagement with the sheet, Fig. 10.

The spring 80 is connected at one end to the frame of the machine and at its other end to an arm 81 rigidly mounted on the shaft 78′, Fig. 9. This arm is connected by a link 81′ to an impression control stop bolt 34′. This bolt is slidably located in the frame of the machine at the limit of the forward travel of the carriage and it is adapted to be projected into the path of the roller 33 to effect the lowering of the platen roller into impression position, as previously described.

The foregoing operation presupposes that a sheet has been properly fed to the machine and has operated the safety finger and has caused the safety trip pawl to be engaged with its block and the pin 40 to be arranged in position for engagement by the gripper shaft arm. But if a sheet has not been fed to the machine or has not been properly fed to the machine and the safety finger has not been operated the latch pawl 67 will be swung aside so that it will not engage the control rod 67′, Fig. 17. The compression spring 69′ can then thrust the control rod 67′ up so far that the block 69 will be in a position where the safety trip pawl cannot latch to the block, Fig. 24. Then the spring 68′ may swing the throwout lever 68 down and rock the gripper shaft control rocker to carry its pin 40 out of the path of the upturned end 37‴ of the gripper shaft so that the gripper will not operate. It will be understood that the throwout lever is rocked during every cycle of operation of the carriage and if there is a sheet of paper properly fed to the machine and to be gripped the safety trip pawl will be latched to the block, because the block will be held down to a position where the latch can engage therewith; but if there is no sheet of paper to be gripped the block will be up so far that the pawl cannot latch thereto and this will prevent the gripper from functioning.

The sheet must be fed squarely into the machine to engage the downturned ends of the guide fingers 60 and 61, thus insuring that the printing impression will be square on the sheet. If the sheet is fed to the machine so that it does not engage all of the guide fingers, as shown for example in Fig. 16, the safety finger 63 will not be operated and the result will be just the same as if no sheet were fed to the machine, as previously described. The movement of the safety finger relative to its guide finger 60 is very slight,

as indicated in Fig. 17 by the space between the downturned ends 63′ and 60′.

The ribbon should be fed one tooth of the ratchet 53 for each complete printing operation; it should not be fed unless there has been an actual printing impression taken through it. Since the machine is adjusted for a single tooth feed of the ribbon at each printing impression, it is not desirable that there should be a greater feed between printing impressions, as would happen if there was a feed of the ribbon during the operation of the machine when no impression was taken, because that would bring more fresh ribbon into impression position than has been predetermined and provided for by the adjustment. Therefore, provision is made to prevent feeding the ribbon when no impression is taken and this is accomplished by a cam 82 on an arm 82′ rigid with the bell crank arm 78, 78″ fixed on the shaft 78′, Fig. 4. This cam arm has a slot 82″ which engages the stub shaft 53′ to limit the downward movement of the cam arm, Figs. 4 and 24. The cam is arranged to engage the pin 83 on the pawl 54. In the normal operation of the machine, when a sheet is properly fed for each cycle of operation, the pawl 54 engages the ratchet and feeds the takeup roller a tooth of the ratchet at each operation. But if a sheet is not fed, or is improperly fed, the safety trip pawl does not engage the block and the throwout lever is pulled down by the spring 68′ which pulls down the rod 76 the arm 75 the rod 77 and swings the bell crank 78, 78″ to prevent the gripper from operating as previously described and also to cause the cam 82 to engage the pin 83 and disengage the feed pawl 54 from the ratchet 53. This will prevent the feeding of the ribbon during this cycle of the operation when no sheet is fed or a sheet is improperly fed. If a sheet is then properly fed into the machine to be printed during the next cycle of operation, the safety finger will operate and the safety trip pawl will latch on the block and the spring 80 will pull the bell crank and other connected devices over to the normal position, shown in Fig. 4, with the pawl 54 in engagement with the ratchet. The spring 68′ is stronger than the spring 80 so that it will swing the throwout lever and the parts connected therewith whenever the safety trip pawl 70 is disengaged from the block, overcoming the tension of the spring 80.

If an address device to be printed has been fed from the magazine to printing position and a sheet is not fed or is improperly fed to the machine the address device must not be discharged, but must be held in printing position during the cycle of operation of the machine without the sheet so that it can print in the next cycle of operation when a sheet is properly fed. In the normal operation of the machine the address device is fed from the magazine to printing position by the arm 11 during its rocking movement from left to right, Fig. 4, during which the offset 17″ engages the block 12′ to carry the arm 11 from left to right as the rocker 17 is pulled from left to right by the angle link 18. The feeding movement of the address device takes place during the forward movement of the carriage and if the carriage fails to carry a sheet across the form the safety trip pawl will not be engaged with its block and the right end of the throwout lever 68 will be swung to elevated position by the spring 68′, as shown in broken lines in Fig. 24, carrying the cam shoulder 72′ into the path of the pin 84 which is carried by the pawl 16, Fig. 4. As the pin rides up the cam 72′, Fig. 4, the pawl 16 is lifted out of operative relation to the block 12′ so that on the return stroke of the rocker 17, corresponding to the return stroke of the carriage, the pawl will not engage the block 12′ and the arm 11 will remain in the dotted line position, Fig. 24, holding the address device in printing position. The machine may go on operating, but so long as a sheet is not carried by the carriage into printing position the address feed will not function because the safety trip pawl remains unlatched from its block; but as soon as the safety finger is operated by a properly fed sheet the safety trip pawl will be reengaged with its block thereby lowering the end of the throwout lever having the cam shoulder 72′ to permit the pawl 16 to engage the block 12′ and also to permit the safety trip pawl to engage the block 69 so that all the parts will function in their normal manner.

As before stated this machine is set to skip tab print and every address device having a tab which engages the selector finger will be skipped and passed through the machine in a regular cycle of operation without printing, and during this cycle of operation no sheet will be fed, the platen roller will not be lowered into printing position, and the ribbon will not be fed. On the return movement of the arm 11 after feeding an address device into printing position it will carry the selector dogs 9 into operative engagement with the lowermost address device in the stack and move this address device to the left, Fig. 1, so that it will or will not engage and operate the selector depending upon whether it has a tab or not and how the machine is set. Assuming that the lowermost address device has no tab to engage the selector finger the selector frame 14 will not be swung on its pivot and the arm 85 on the selector frame will remain in latching engagement with the arm 86 Fig. 27 on the selector rocker 86′ which is supported in the frame of the machine. A spring 14″ is attached to the magazine and also to the selector frame to return the frame to normal position after it has been

operated by an address device, and a spring 86'' attached to the selector rocker and to the frame of the machine normally holds the rocker arm 86 up into engagement with the selector arm 85, as shown in Fig. 27.

A link 87 is pivotally hung from the selector rocker 86 and it is selectively engaged at 88 or 88' with a rocker 89 which is pivotally mounted on the frame of the machine. In Fig. 27 the link is engaged at 88' with the rocker to skip tabs; if the link were engaged at 88 with the rocker it would print tabs. The rocker 89 has an arm 89' which engages the arm 75, Fig. 4. Whenever a sheet is properly fed to the machine it will operate the safety finger and the safety trip pawl will be engaged with the block; but it will be necessary to prevent the sheet from being gripped and carried by the carriage across the printing form if the address device being fed is not to be printed. Therefore the lever arm 75 is interposed between the safety trip pawl 70 and the bell crank 78, 78'' so that the selector mechanism may operate the arm 75 even though the safety trip pawl is latched to the block. When the rocker arm 89' is caused to engage and depress the lever arm 75 the bell crank 78, 78'' is operated to prevent the gripper from operating to prevent the ink ribbon from feeding and to prevent the platen from being lowered into impression position. If a tabbed address device to be skipped engages the selector finger 15', it will swing the selector frame to the left, Fig. 27, disengaging the selector arm 85 from the arm 86 and permitting the spring 86'' to swing the rocker 86' and cause the link 87 to swing the rocker 89 and cause the arm 89' to depress the lever arm 75. To restore the rocker 86' to normal position with the arm 86 depressed to permit engagement beneath the selector arm 85 the rocker is provided with an arm 90, Fig. 27, carrying a roller 90' which is arranged to be engaged by a cam 91 carried by the address feed drive arm 11. In order to feed an address device it is necessary that the safety trip pawl 70 should be engaged with the block 69 so that the right end of the throwout lever 68, Fig. 4, will remain down and permit the pawl 16 to engage the block 12' and, in co-operation with the offset shoulder 17'', effect a reciprocation of the address feed lever arm 11. Therefore it is essential that the safety trip pawl shall remain in latching engagement with the block while the address device not to be printed is being fed through the machine and while the gripper, the platen roller and the ribbon feed mechanism are prevented from functioning.

In the general use of the machine the changeable printing devices will bear addresses for addressing envelopes and letters, and therefore we have referred to them herein generally as address devices, but other printing forms may be used and we desire to have it understood that by the term address device, or equivalent terms, we include any printing device adapted to be fed successively through the machine.

The machine herein described is for printing letters, circulars or other matter for which it is or may be adapted, but it is especially designed for and useful in printing personally addressed form letters in simulation of typewriting. The invention is of special importance because it provides a machine which is automatic in all of its essential parts and because the several groups of mechanism are co-ordinated to operate or not to operate, as may be required. If for any reason a sheet is not fed or is not fed properly to the machine the gripper will not operate, the platen roller will not be lowered to impression position, the ribbon feed will not operate, the address device will be fed to and held in printing position; if an address device is fed which is not to be printed, the gripper will not operate and consequently a sheet will not be fed to impression position, the platen roller will not be lowered into impression position and the ribbon feed will not operate, but the address device will feed through the machine in the regular way. The operation of the several parts is simple, but they are coordinated in such a way that they will work automatically as they are intended to work to perform their several functions with respect to each other. The gripper is shaped to fit the feed roller and it presses the sheet down and partly around the feed roller so that the sheet will be positioned in the bight between the feed roller and the platen roller when these rollers are adjusted in clamping relation. It is also important that the sheet be squared in the machine for the printing operation as any sheet that is not fed squarely against the guide fingers will not be fed through the machine; therefore all the printed sheets will have the printed matter properly disposed thereon.

We claim:

1. In a printing machine, an impression platen, means for shifting the platen to and from impression position and means for controlling said shifting means and comprising bodily slidable means arranged above the sheet to be printed and adapted to be operated by the sheet in a direction substantially parallel with the movement of the sheet.

2. In a printing machine, an impression platen, means for shifting the platen to and from impression position, and means for controlling said shifting means and comprising a bodily slidable finger arranged above the sheet to be printed and adapted to be operated by the sheet in a direction substantially parallel with the movement of the sheet.

3. In a printing machine, an impression platen, means for shifting the platen to and from impression position, and means for

controlling said shifting means and comprising a bodily slidable finger arranged above the sheet to be printed and having a downturned front end adapted to be engaged by the sheet to slide the finger in a direction parallel with the movement of the sheet.

4. In a printing machine, an impression platen, means for shifting the platen to and from impression position, a plurality of sheet guides spaced apart for registering the sheet to be printed and means for controlling said shifting means and comprising a bodily slidable finger arranged above the sheet and adapted to be operated by the sheet in a direction substantially parallel with the movement of the sheet, said finger being arranged between two of said guides and operating to complete its movement when the sheet is registered with both of said guides.

5. In a printing machine, an impression platen, means for shifting the platen to and from impression position, and means for controlling said shifting means and comprising a bodily slidable zigzag finger arranged above the sheet to be printed and adapted to be operated by the sheet in a direction substantially parallel with the movement of the sheet.

6. In a printing machine, a printing form, an impression platen, means for shifting the platen to and from impression position, slidable means operated by a sheet of paper for controlling said shifting means, a roller, means operated by the slidable means for positioning the sheet between said roller and platen, and means cooperating with said roller for clamping the sheet against said roller.

7. In a printing machine, a printing form, an impression platen, means for shifting the platen to and from impression position, slidable means operated by a sheet of paper for controlling said shifting means, a roller, means operated by the slidable means for positioning the sheet between said roller and platen, means cooperating with the roller for clamping the sheet against said roller, and means for causing said roller to contact with said platen and be revolved thereby for feeding said sheet into impression position.

8. In a printing machine, a feed roller, a relatively stationary gripper separate from the roller and curved complementary to the surface of the roller, and means for operating the gripper to engage a sheet of paper between itself and the roller.

9. In a printing machine, a feed roller, a bodily slidable finger arranged above the sheet to be printed and adapted to be operated by the sheet in a direction substantially parallel with the movement of the sheet, a relatively stationary gripper separate from the roller, and means controlled by said finger for operating said gripper to engage the sheet with said roller.

10. In a printing machine, a roller, a sliding finger adapted to be operated by a sheet, a gripper comprising means for bending the sheet about a part of the surface of the roller, and means controlled by said finger for operating said gripper.

11. In a printing machine, a platen roller, a roller arranged in adjacent relation to the platen roller, means for gripping a sheet against the roller and in position between the roller and the platen roller, and means for shifting the roller to clamp the sheet between itself and the platen roller.

12. In a printing machine, a platen roller, a roller arranged adjacent to the platen roller and above the plane of impression position, means for gripping a sheet against the roller and bending it about a part of said roller, and means for moving the roller to clamp the sheet between itself and the platen roller.

13. In a printing machine, a printing form, an impression platen, means for shifting the platen to and from impression position, slidable means operated by a sheet of paper for controlling said shifting means, a roller, and means operated by said slidable means for positioning said sheet between said roller and said platen.

14. In a printing machine, a printing form, an impression platen, means for shifting the platen to and from impression position, a guide to register the sheet in the machine, a finger slidable on the guide and adapted to be operated by the sheet, and means controlled by the finger for controlling the operation of the shifting means.

15. In a printing machine, a guide for registering a sheet therein, and a zigzag finger slidable on the guide and adapted to be operated by the sheet.

16. In a printing machine, a guide for registering a sheet therein and having a longitudinal recess, and a zigzag finger slidable in said recess and adapted to be operated by the sheet.

17. In a printing machine, a guide for registering a sheet therein and having a downturned end, there being a recess in said guide and downturned end, and a zigzag finger having a downturned end to slide and seat in said recess.

18. In a printing machine, a guide for registering a sheet therein and having a longitudinal recess, a finger slidable in said recess and cooperating with the guide and adapted to be operated by the sheet, and a cover over said finger and engaging the guide.

19. In a printing machine, a printing form, an impression platen, means for feeding printing devices one at a time into printing position, selector means, means for preventing the platen from moving to printing position when a sheet is not properly fed to the

machine, a gripper, for gripping a sheet, and means operated by the selector means to prevent operation of the gripper when a printing device is not to be printed.

20. In a printing machine, a printing form, an impression platen, means for shifting the platen to and from impression position, means for feeding printing devices one at a time into printing position, selector means, means for preventing the shifting means from shifting said platen to impression position when a sheet is not properly fed to the machine, a roller adjacent to said platen, a gripper for clamping the sheet to said roller, and means operated by the selector means for preventing the gripper from operating when the printing device is not to be printed.

21. In a printing machine, a printing form, an impression platen, means for feeding printing devices one at a time into printing position, means for selecting certain of said printing devices to be printed, a gripper, means operated by a sheet of paper to cause said gripper to operate, means for preventing the platen from engaging said form when a sheet is not fed to the machine, and means operated by the selector means for preventing the gripper from operating when certain devices are not to be printed.

22. In a printing machine, a platen, a printing form, means to prevent said platen from shifting to impression position when a sheet is not fed to the machine, means for feeding printing devices to printing position in the machine, means for selecting certain predetermined printing devices to be printed, a gripper for engaging the sheet, and means for preventing the gripper from operating when certain printing devices are not to be printed.

23. In a printing machine, a platen, a printing form, slidable means for causing said platen to shift into impression position only when a sheet of paper is engaged thereby, means for feeding printing devices to said machine, means for selecting certain predetermined printing devices to be printed, and means operated by the selector means for preventing the sliding means from shifting said platen into impression position when certain printing devices are not to be printed.

24. In a printing machine, a platen, a printing form, a sliding finger positioned to be engaged edgewise of and moved with a sheet of paper for causing said platen to shift into impression position only when a sheet of paper is engaged thereby, means for feeding printing devices to said machine, means for selecting certain predetermined printing devices to be printed, and means operated by the selector means for preventing the finger from shifting the platen to impression position when certain printing devices are not to be printed.

25. In a printing machine, a platen, a printing form, slidable means for causing said platen to shift into impression position only when a sheet of paper is engaged thereby, means for feeding printing devices to said machine, means for selecting certain predetermined printing devices to be printed, an ink ribbon adapted to be intermittently fed across said form, and means cooperating with said selector means and said slidable means to prevent the platen from attaining impression position and for preventing the ribbon from being fed when certain printing devices are not to be printed.

26. In a printing machine, a platen, a printing form, shifting means to move the platen to and from printing position, a slidable member positioned to be engaged by and moved parallel with a sheet of paper for controlling the shifting means, means for feeding printing devices into printing position, selector means for causing predetermined printing devices to be printed, and means operated by the selector means and cooperating with the sheet operated controlling means for preventing the platen from attaining impression position when certain printing devices are not to be printed.

27. In a printing machine, a platen, a printing form, shifting means to move the platen to and from printing position, an ink ribbon adapted to be fed intermittently across said form, sheet operated means for controlling the shifting means, means for feeding printing devices into printing position, selector means for causing predetermined printing devices to be printed, and means operated by the selector means and cooperating with the sheet operated controlling means for preventing the platen from attaining impression position and for preventing the ribbon from being fed when certain printing devices are not to be printed.

28. In a printing machine, a platen, a printing form, shifting means to move the platen to and from printing position, slidable means operated by a sheet of paper for controlling the shifting means, means for feeding printing devices into printing position, selector means for causing certain predetermined printing devices to be printed, and means operated by the selector means and cooperating with the slidable means for preventing the platen from attaining impression position when certain printing devices are not to be printed.

29. In a printing machine, a platen, a printing form shifting means to move the platen to and from printing position, slidable means operated by a sheet of paper for controlling the shifting means, an ink ribbon adapted to be intermittently fed across said form, means for feeding printing devices into

printing position, selector means for causing certain predetermined printing devices to be printed, and means operated by the selector means and cooperating with the slidable means for preventing the platen from attaining impression position and for preventing the ribbon from being fed when certain printing devices are not to be printed.

30. In a printing machine, a platen, an impression form, a roller, a gripper engaging said roller, means for shifting the platen to and from impression position, means for preventing the gripper from operating unless a sheet is properly fed to the machine, means for feeding printing devices to printing position, means for selecting certain printing devices to be printed, and means operated by the selector means for preventing the gripper from operating when certain printing devices are not to be printed.

31. In a printing machine, a platen, a form, an ink ribbon adapted to be intermittently fed across said form, means for shifting the platen into printing position only when a sheet of paper is fed to the machine, and means for preventing the ribbon from feeding unless a sheet is fed into the machine.

32. In a printing machine, an impression platen, a form, means for shifting the platen into printing position only when a sheet is fed to the machine, an ink ribbon extending across said form, and feeding means for said ribbon to be operated only when a sheet is fed into the machine.

33. In a printing machine, an impression platen, a form, means operated by a sheet of paper for shifting said platen into printing position, means for preventing said platen from attaining printing position unless a sheet is fed into the machine, an ink ribbon, means operated only when a sheet is fed to the machine for feeding the ribbon intermittently across the form, means for feeding printing devices into said machine, selector means for causing certain predetermined printing devices to be printed, and means operated by said selector means and cooperating with the sheet operated means for preventing the platen from being shifted to printing position and for preventing the ribbon from being fed when certain printing devices are not to be printed.

34. In a printing machine, an impression platen, a form, means for shifting said platen to and from impression position, means operated by a sheet of paper for causing said shifting means to shift said platen into printing position, an ink ribbon adapted to be fed intermittently across said form, means for preventing said ribbon from being fed unless a sheet is fed to the machine, means for feeding printing devices into printing position, selector means for causing certain predetermined devices to be printed, and means operated by said selector means for preventing the shifting means from shifting the platen into impression position and for preventing the ribbon from being fed when certain printing devices are not to be printed.

35. In a printing machine, a platen, a form, an ink ribbon adapted to be intermittently fed across said form, means for shifting the platen to and from printing position, means operated only when engaged by a sheet of paper for operating said shifting means to shift the platen into printing position, and means cooperating with said sheet engaging means to prevent said ribbon from feeding when a sheet is not fed to said machine.

36. In a printing machine, an impression platen, a form, an ink ribbon adapted to be intermittently fed across said form, means operated by a sheet of paper to cause said platen to shift into printing position, means for feeding printing devices into printing position, means for selecting certain printing devices to be printed, and means operated by the selector means to prevent the sheet operating means from operating and for preventing the ribbon from being fed when certain printing devices are not to be printed.

37. In a printing machine, a platen, a printing form, means for shifting the platen to and from printing position, a latch for causing said shifting means to shift the platen into printing position only when said latch is locked, said latch adapted to be locked only when a sheet of paper has been fed to the machine, means for feeding printing devices to printing position, means for selecting certain printing devices to be printed, and means operated by the selector means when certain devices are not to be printed for preventing the shifting means from shifting the platen into printing position even though the latch is locked.

38. In a printing machine, a platen, a printing form, means for shifting the platen to and from printing position, an ink ribbon adapted to be intermittently fed across said form, a latch for causing said shifting means to shift the platen into printing position only when said latch is locked, said latch adapted to be locked only when a sheet of paper has been fed to the machine, means for feeding printing devices into printing position, means for selecting certain printing devices to be printed, and means operated by the selector means when certain devices are not to be printed for preventing the shifting means from shifting the platen into printing position and for preventing the ribbon from feeding even though the latch is locked.

39. In a printing machine, the combination of a carriage, a printing form, a platen roller mounted in the carriage, means for moving the carriage back and forth across the form,

and means for shifting the platen roller lengthwise and relatively to the carriage for each cycle of operation of the carriage.

40. In a printing machine, the combination of a carriage, a printing form, a platen roller mounted in the carriage, means for moving the carriage back and forth across the form, means for shifting the platen roller into and out of printing position, and means co-operating with said shifting means for shifting the platen roller lengthwise relatively to the carriage.

41. In a printing machine, a printing form, a carriage, means for moving the carriage back and forth across the printing form, a platen roller carried by the carriage, means for shifting the carriage into and out of printing position, and means to receive the platen roller when it is shifted into printing position and before it engages the form to revolve the platen roller.

WALTER T. GOLLWITZER.
HENRY E. HUBBARD.