MILES H. MANN, WEBB M. OUNGST & WALTER M. OUNGST.

WEB FEEDING AND CUTTING ATTACHMENT.

APPLICATION FILED JAN. 5, 1909.

954,817.

Patented Apr. 12, 1910.

5 SHEETS—SHEET 1.

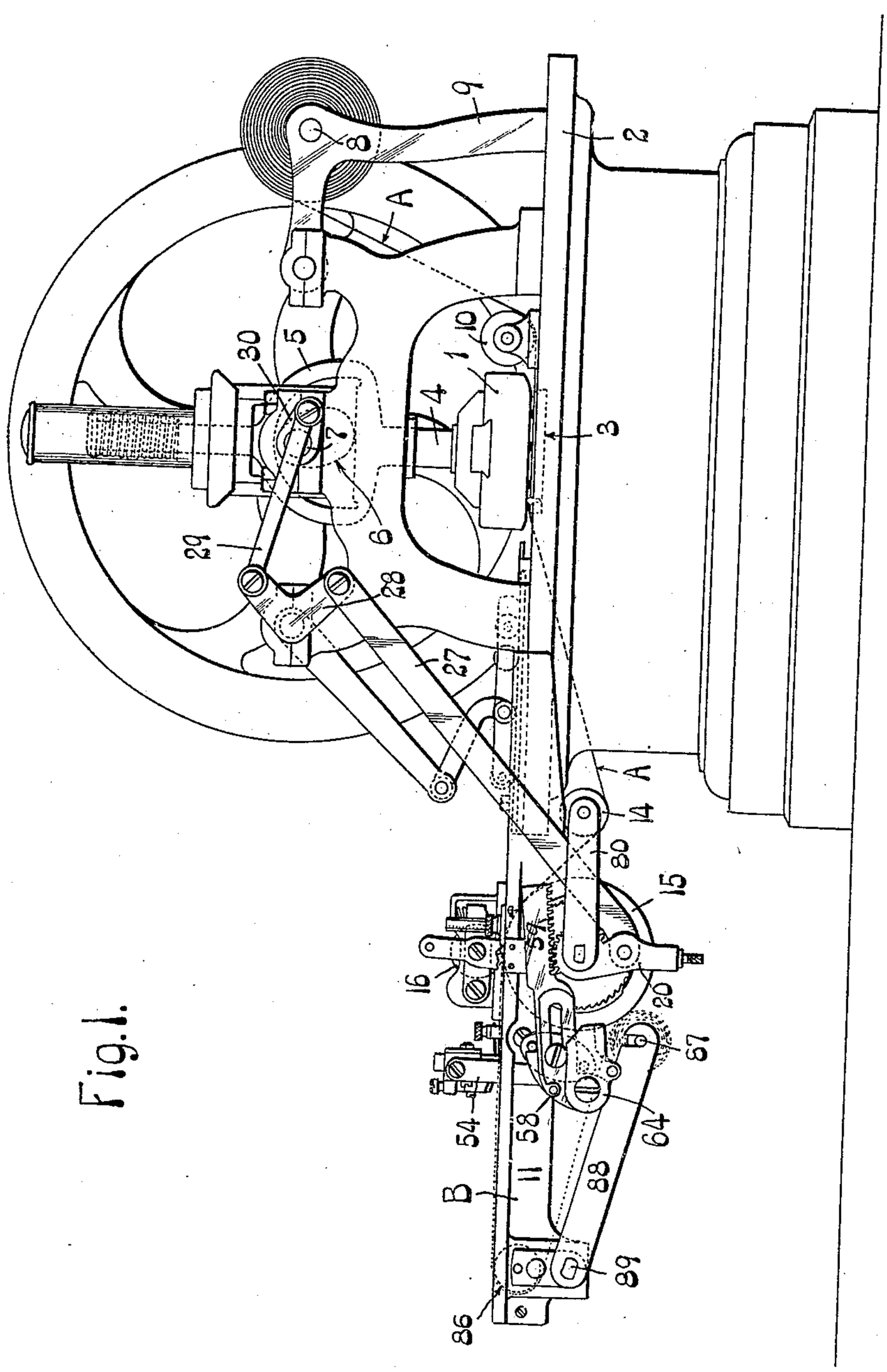

Fig. 1.

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5 SHEETS—SHEET 2.

Fig. 2.

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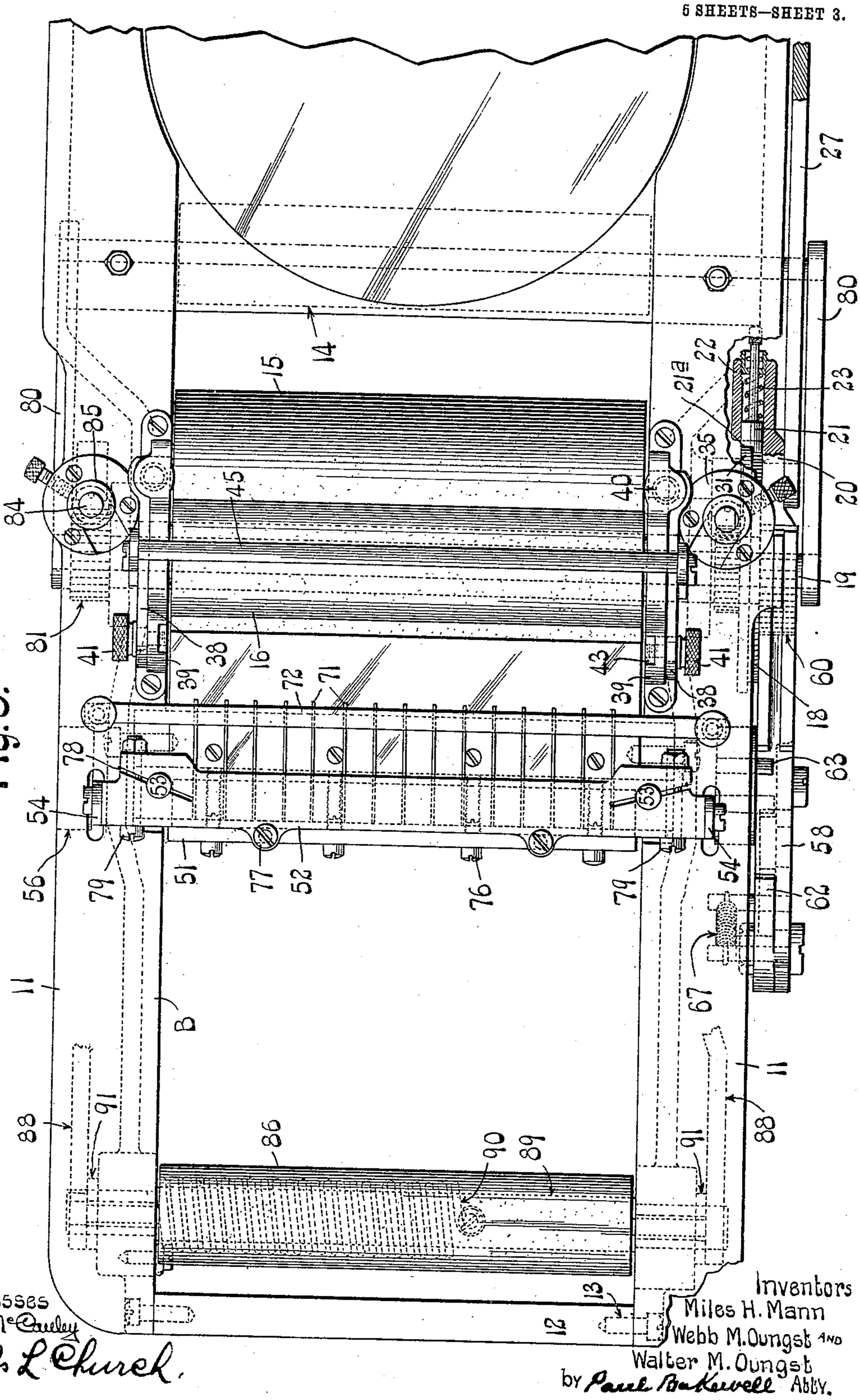

Fig. 3.

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5 SHEETS—SHEET 4.

Fig. 4.

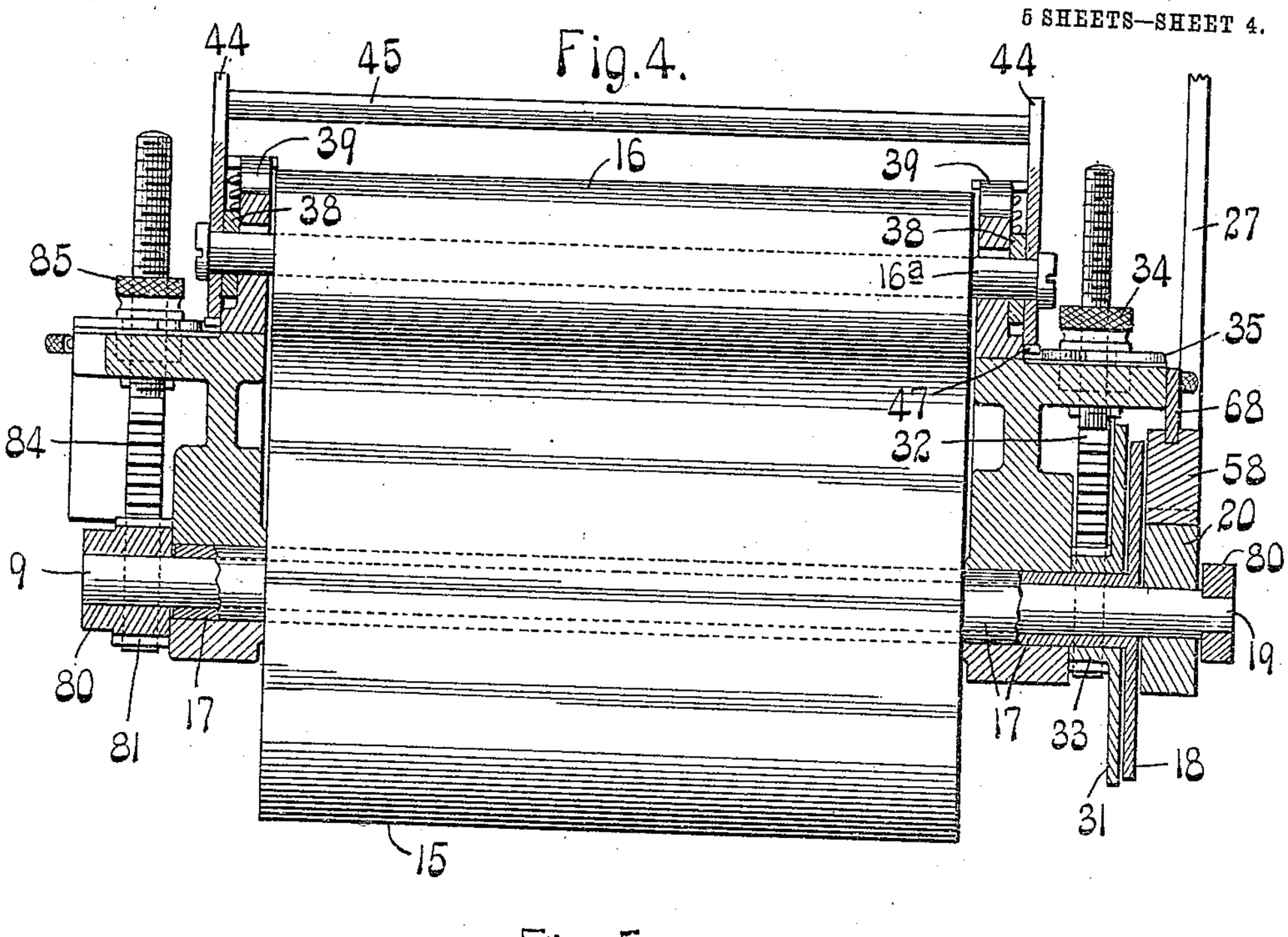
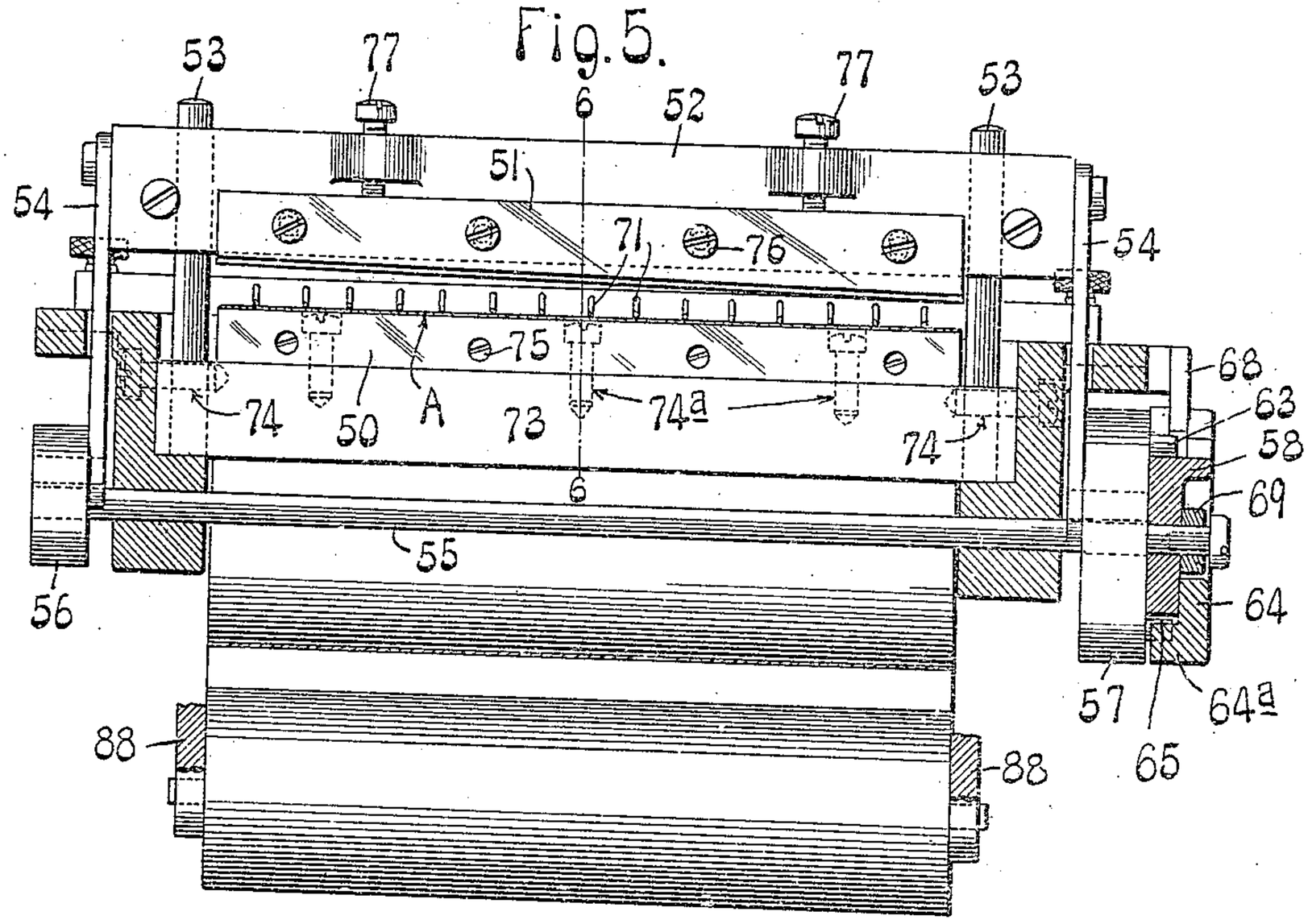


Fig. 5.



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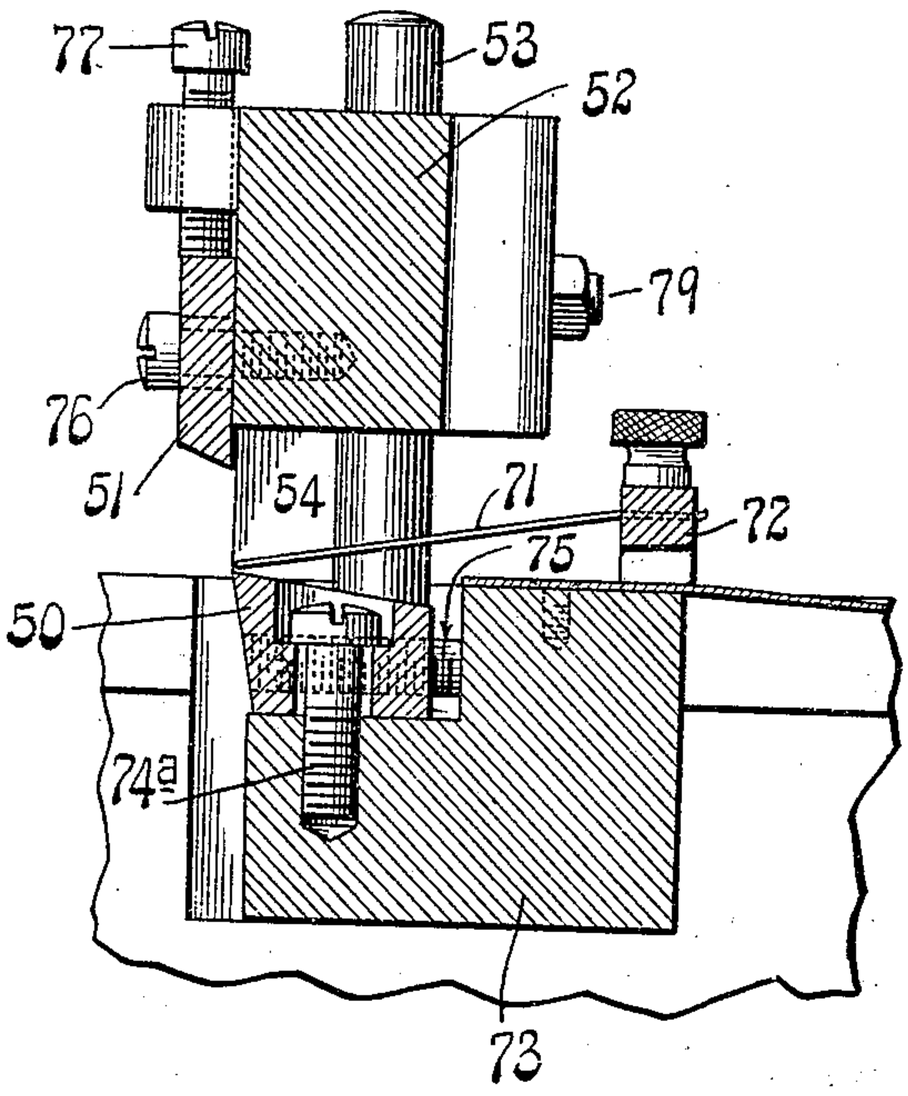
5 SHEETS—SHEET 5.

Fig. 6.



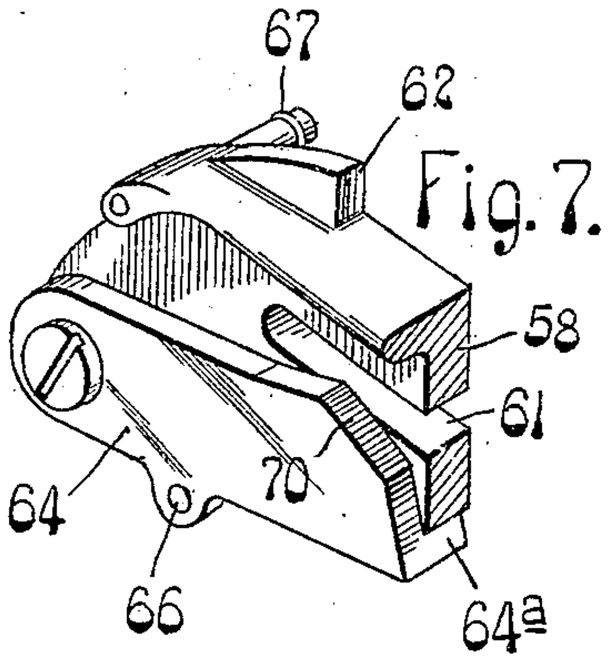


Fig. 7.

Fig. 8.

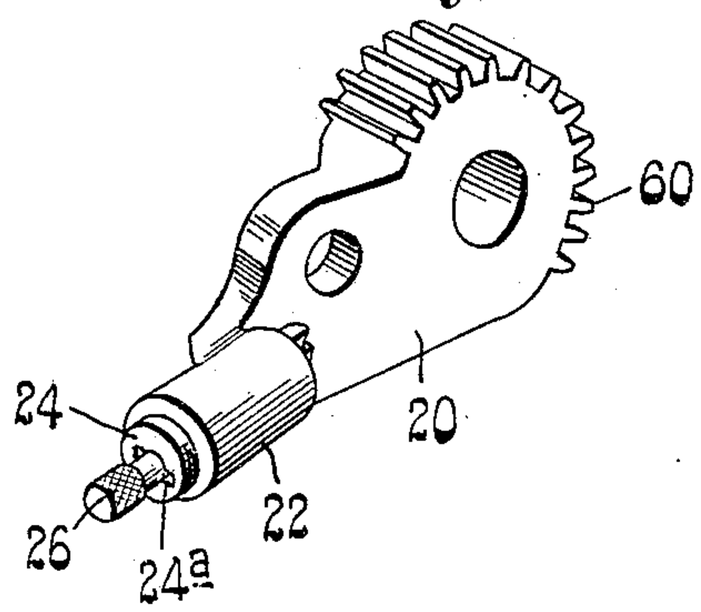
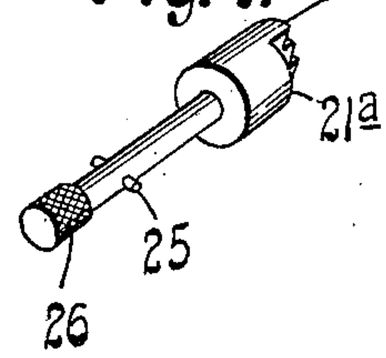


Fig. 9.



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UNITED STATES PATENT OFFICE.

MILES H. MANN, OF LOUISIANA, AND WEBB M. OUNGST AND WALTER M. OUNGST, OF GREENWOOD, MISSOURI, ASSIGNORS TO FRANK W. BUFFUM, OF LOUISIANA, MISSOURI.

WEB FEEDING AND CUTTING ATTACHMENT.

954,817. Specification of Letters Patent. **Patented Apr. 12, 1910.**

Application filed January 5, 1909. Serial No. 470,890.

To all whom it may concern:

Be it known that we, MILES H. MANN, residing at Louisiana, Missouri, and WEBB M. OUNGST and WALTER M. OUNGST, residing at Greenwood, St. Louis county, Missouri, all citizens of the United States, have invented a certain new and useful Improvement in Web Feeding and Cutting Attachments, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevational view of a printing machine provided with a web feeding attachment constructed in accordance with our invention; Fig. 2 is an enlarged side elevational view of said web feeding attachment; Fig. 3 is a top plan view of the parts shown in Fig. 2; Fig. 4 is a vertical sectional view taken on approximately the line 4—4 of Fig. 2; Fig. 5 is a vertical sectional view taken on approximately the line 5—5 of Fig. 2; Fig. 6 is a vertical sectional view taken on approximately the line 6—6 of Fig. 5; Fig. 7 is a detail perspective view of the pawl and the reciprocating member that form part of the mechanism for actuating the movable cutter of the web severing mechanism; Fig. 8 is a detail perspective view of the pawl-carrier that forms part of the means for operating one of the feeding rollers; and Fig. 9 is a detail perspective view of the pawl mounted on said pawl-carrier.

This invention relates to printing machines, and particularly to that type which automatically feed a web or continuous strip from a supply roll, sever into short lengths or slips and print each of said slips.

The main object of our invention is to provide a web-feeding attachment of simple construction that can be applied to small printing machines such, for example, as those used for printing cards and envelops.

Another object of our invention is to provide a machine that will either print, feed and sever a web or continuous strip, or merely print the web and then re-wind it.

Another object is to provide a machine having a web-feeding and severing mechanism which is so constructed that it can be maintained in an inoperative position and thus enable the printing machine, to which it is applied, to be used for printing cards or separate sheets that are fed one by one to the printing mechanism. And still another object is to provide a web-feeding and severing mechanism provided with novel means for varying the length of the slips or short pieces that are produced by severing the web.

Other objects and desirable features of our invention will be hereinafter pointed out.

Referring to the drawings which illustrate the preferred form of our invention, 1 designates the type-carrier of a printing machine, and 2 designates the bed plate of said machine which is provided with a platen 3, shown in dotted lines in Fig. 1. The type-carrier is connected to a vertically disposed reciprocating plunger 4 provided at its upper end with a yoke 5 inside of which a cam 6 is arranged, said cam being connected to a horizontally disposed drive shaft 7. The particular type of printing machine, however, with which our improved web-feeding and severing mechanism is used is immaterial, so far as our broad idea is concerned, and therefore we do not wish it to be understood that our invention is limited to the printing machine herein shown or to one provided with a reciprocating type-carrier.

The paper or material that is to be printed consists of a continuous strip or web A wound into a roll which is mounted on a shaft 8 journaled in a support 9 on the bed plate of the printing machine, said bed plate being provided with a guiding roller 10 under which the strip A passes.

Our improved web-feeding and severing mechanism is carried by a frame B detachably connected to the base plate of the printing machine and consisting of two side pieces 11 and an end piece 12 arranged between the outer ends of said side pieces and connected thereto by fastening devices 13, as shown clearly in Fig. 3. An adjustable guiding roller 14 is carried by the frame B, and two feeding rollers 15 and 16 are also carried by said frame, the strip A passing from the platen under the guiding roller 14 and thence between the rollers 15 and 16, as shown clearly in Fig. 1. The feeding roller 15 is secured to a sleeve or hollow shaft 17 mounted in bearings on the

frame B, and a ratchet wheel 18 is fastened to one end of said sleeve, as shown in Fig. 4. A solid shaft 19 extends longitudinally through said sleeve, and a pawl-carrier 20 is loosely mounted on said shaft outside of the ratchet wheel 18, said pawl-carrier being provided with a spring-pressed pawl 21 that cooperates with the teeth on the ratchet wheel 18 to impart rotary movement thereto so as to actuate the feed roller 15.

As shown clearly in Figs. 8 and 9, the pawl 21 is provided with a plunger that passes through a sleeve 22 on one side of the pawl-carrier 20, said sleeve being provided with a recess inside of which a coiled expansion spring 23 is arranged, as shown in dotted lines in Fig. 2, so as to force the pawl toward the ratchet wheel 18. A screw or adjustable device 24 that is mounted in the sleeve 22, forms an abutment for one end of the spring 23, and said screw is provided with a slot 24ª that receives a cross pin 25 on the shank or plunger of the pawl 21 so as to prevent said shank from turning. On the outer end of said shank is a knurled head 26 that can be grasped to move the pawl away from the ratchet wheel and also enable the shank to be turned after the pin 25 has been withdrawn from the slot 24ª so as to hold the pawl in an inoperative position for a purpose hereinafter described.

The pawl-carrier 20 is oscillated intermittently by means of a link 27 which has its lower end pivotally connected to said pawl-carrier and its upper end pivotally connected to one arm of a bell crank lever 28, whose other arm is connected by means of a link 29 to an arm 30 or eccentric on the drive shaft 7 of the printing machine, as shown in Fig. 1. The pawl-carrier 20 is moved a certain distance at each cycle of operations of the printing machine but means is provided for varying the degree of movement imparted to the feed roller 15 so as to enable the strip A to be fed different distances. The means herein shown for governing the feed consists of a cam plate 31 loosely mounted on the hub or sleeve 17 of the feed roller 15 between the ratchet wheel 18 on said sleeve and the side piece of the frame B, as shown in Fig. 4, said cam plate operating to disengage the pawl 21 from the ratchet wheel 18 at a certain point in the movement of the pawl-carrier. As shown in Fig. 2, the cam plate 31 merely consists of a disk which has a portion of its periphery cut away at 31ª so as to permit the pawl to move inwardly far enough to engage the teeth of the ratchet wheel with which it coöperates. Said pawl is provided with a shoulder 21ª, as shown in Fig. 9, and when the pawl-carrier reaches a certain point in its stroke said shoulder will ride up onto the high point of the cam plate; namely, that portion of the periphery of the cam plate which is not cut away and thus cause the pawl to move away from the ratchet wheel 18, the disengagement of said pawl and ratchet wheel, of course, causing the feed roller 15 to come to rest.

By changing the position of the cam plate we can vary the degree of movement imparted to the feed roller 15, and the means herein shown for adjusting said cam plate consists of a vertically disposed rack bar 32 that meshes with a segmental-shaped rack 33 on the cam plate, as shown in dotted lines in Fig. 2. The rack bar 32 has a screw-threaded portion that passes upwardly through a nut 34 journaled in a bearing 35 so that vertical movement will be imparted to said rack bar whenever the nut 34 is rotated. The upper end of said rack bar is preferably provided with a gage 32ª, as shown in Fig. 2, that enables the operator to set the rack bar at just the proper position to obtain a certain feed. Any suitable means can be provided for locking the nut 34 in its adjusted position, and any suitable means can be provided for preventing the rack bar from rotating when said nut is turned. In the construction herein shown the adjusting nut 34 is locked by means of a set screw 36 which passes through a screw-threaded opening in the frame B and engages said nut, and the rack bar is prevented from rotating by means of a plate 37 provided with a lug or tongue that projects into an elongated slot in the screw-threaded portion of the rack bar.

The feed roller 16 that coöperates with the positively driven feed roller 15 is arranged above same, as shown in Fig. 2, and means are provided for yieldingly holding said rollers in engagement with each other. The feed roller 16 is mounted on the shaft 16ª that passes through levers 38 pivotally connected to stationary brackets 39 and provided at their free ends with recesses or pockets in which coiled expansion springs 40 are arranged, the upper ends of said springs bearing against lugs on the brackets 39 and thus forcing the levers 38 downwardly so as to hold the rollers 15 and 16 in yielding engagement with each other. Each of the levers 38 is pivotally connected to the bracket which carries it by means of a screw 41 that passes through an elongated slot 42 in the bracket and has its inner end screw-threaded into a block 43 arranged in a groove on the inside of the bracket, as shown in Figs. 2 and 3. By loosening the screws 41 and moving them to a different position in the slots 42 in the supporting brackets the fulcrums of the levers 38 will be changed and thus vary the tension of the springs 40 which hold the feed rollers in yielding engagement with each other. For enabling the spring-pressed roller 16 to be moved away from the feed roller 15 we have

provided each of the levers 38, which carry the roller 16, with a pivotally mounted arm 44 having an inclined face on its lower end that engages a stationary abutment when the arm 44 is moved in one direction and thus elevates the lever 38 with which it coöperates. The arms 44 are preferably connected together by a cross bar 45 and each of said arms is provided at its lower end with an inclined face that terminates in two notches 46, said inclined faces coöperating with stationary pins 47 so as to cause the levers 38 to move upwardly when said arms are swung in one direction.

A severing mechanism is located at the rear of the feed rollers 15 and 16 for severing the strip A into short lengths or slips, said severing mechanism comprising a stationary cutter 50 and a reciprocating cutter 51 coöperating therewith to produce a shearing cut. The reciprocating cutter is connected to a cross head 52 slidingly mounted on vertically disposed guides 53 and having actuating links 54 connected to the ends of same, the lower ends of said links being eccentrically connected to an operating shaft 55 journaled in the side pieces of the frame B. This operating shaft 55 is provided at one end with an arm 56 to which one of the links 54 is connected, and on the other end of said shaft is a tappet 57 to which the other link 54 of the cross head 2 is connected so that said cross head will be reciprocated whenever said shaft 55 is rocked. The means herein shown for rocking the shaft 55 consists of a reciprocating member 58 provided with rack teeth 59, as shown in Fig. 2, that mesh with rack teeth 60 on the pawl-carrier 20, said reciprocating member 58 being provided with an elongated slot 61 through which the rock shaft 55 projects and thus forms a support for said reciprocating member. The member 58 is provided on its upper side with a lug 62 that engages a pin 63 on the tappet 57 when the member 58 moves in one direction so as to rock the shaft 55 in one direction, and a pawl 64, that is pivotally connected to said reciprocating member 58, engages a second pin 65 on the tappet 57 and thus moves the rock shaft 55 in the opposite direction. The pawl 64, as shown clearly in Fig. 7, is provided with a laterally projecting flange 64ª that engages the under side of the reciprocating member 58 and thus limits the upward movement of said pawl, the pawl being provided with a laterally projecting pin 66 to which a spring 67 on the reciprocating member is connected so as to yieldingly hold the pawl in a certain position. Preferably, the reciprocating member 58 is provided on its upper side with a groove into which a guide plate 68 on the frame B projects so as to hold said member 58 in alinement with the pawl-carrier 20. When the pawl-carrier 20 moves downwardly preparatory to feeding the roller 15 the reciprocating member 58 will move forwardly in the direction indicated by the arrow x in Fig. 2, thus causing the flange 64ª on said pawl to engage the pin 65 on the tappet 57 and rock the shaft 55 so as to move the cross head 52 downwardly and thus depress the movable cutter 51. The shaft 55 is provided at one end with a roller 69 that engages an inclined face 70 on the pawl 64 so as to depress said pawl and thus move the flange 64ª thereon out of alinement with the pin 65 on the tappet. Said roller 69 depresses the pawl 64 just before the lug 62 on the reciprocating member engages the pin 63 on the tappet so that said pawl will not obstruct the tappet or prevent it from being moved in the reverse direction by said lug 62 during the last half of the stroke of the reciprocating member 58, the movement which said lug 62 imparts to the tappet operating to restore the movable cutter to its normal elevated position. The upward movement of the pawl-carrier feeds the roller 15 forwardly and also moves the member 58 rearwardly, the pawl 64 being restored to its normal position by the spring 67 as soon as the inclined face on said pawl passes out of engagement with the roller 69 on the end of shaft 55.

The strip A is prevented from sticking to the movable cutter 51 when it moves upwardly by means of a number of yielding strippers 71 carried by a transversely extending cross bar 72 under which the strip or web A passes. In view of the fact that it is sometimes desirable to merely perforate the web instead of completely severing it, we have mounted the cutting blades 50 and 51 in such a manner that they can be removed easily. We accomplish this by connecting the stationary cutting blade 50 to a support 73 that is retained in operative position in the frame B by means of fastening devices 74, shown in dotted lines in Fig. 5. The vertical guides 53 on which the cross head 52 of the movable cutter is mounted, are carried by said support 73 so that both cutting members will be removed when the support 73 is taken out of the frame B. The stationary cutting member 50 is adjustably connected to the support 73 by means of clamping screws 74ª which pass through elongated slots in said cutting member, and said member is provided with screws 75 that bear against a shoulder on the support 73 and thus enable the cutting member to be adjusted. The cutting member 51 is also adjustably connected to the cross head 52 by means of clamping screws 76 that pass through elongated slots in said cutting member, and the cross head is provided with adjusting screws 77 that bear upon the upper edge of the cutting member 51 so as to enable it to be adjusted. As previously stated, the cross head 52 slides on the

vertical guides 53, and in order that wear between said parts may be compensated for, we have provided the end portions of the cross head 52 with slots 78, as shown in Fig. 3, so as to form a pair of yielding jaws at each end of the cross head which embrace the guides 53, each pair of said jaws being adapted to be adjusted so that they will snugly embrace the guides 53 by means of clamping bolts 79 that pass through the cross head.

The adjustable roller 14, under which the web A passes, is carried by a pair of arms 80 rigidly connected to the solid shaft 19 which extends through the hollow shaft or sleeve 17 of the feeding roller 15. The arm 80 at one side of the machine is provided with a toothed segment 81, shown in dotted lines in Fig. 3, with which a rack bar 84 coöperates, said rack bar having a screw-threaded portion which passes through an adjusting nut 85 similar to the nut 34 that is used for adjusting the rack bar 32 which controls the position of the cam plate 31. By turning the nut 85 the shaft 19 will be rocked slightly and thus vary the position of the guide roller 14, the object of varying the position of said guide roller being to cause the cutting member 51 to sever the web at a different point. For example, if the machine is being used for printing labels and it is found that the cutting members do not sever the web at the proper point; namely, between two groups of printing matter on the web, the nut 85 can be turned so as to adjust the roller 14 in a different position and thus increase or diminish the length of that portion of the web which extends from the platen of the printing machine to the cutters 50 and 51.

For enabling a web to be merely printed and then re-wound into roll form, we have arranged a guide roller 86 adjacent one end of the frame B, and a re-winding roll 87 adjacent the feeding roller 15, said re-winding roll being carried by a pair of arms 88 that are connected to a shaft 89 which is journaled in the side pieces of the frame B. A coiled spring 90, which surrounds the shaft 89, operates to move the arms 88 upwardly and thus yieldingly force the re-winding roll against the feeding roller 15, said spring having one of its ends connected to the shaft 89 and its opposite end to the frame B. The shaft of the guiding roll 86 projects through elongated slots in the side pieces of the frame B and is journaled in a pair of arms 91 that can be moved so as to adjust the roller 86 relatively to the feeding rollers, said arms 91 being retained in adjusted position by means of clamping screws 92.

When it is desired to merely print and re-wind the web without severing it, the pawl 64 on the reciprocating member 58 is moved into the position shown in dotted lines in Fig. 2 so that it will not impart movement to the tappet 57 which forms part of the mechanism for operating the movable cutter 51. The end of the web is then connected to the re-winding roll 87, and as said roll is held in yielding engagement with the feed roller 15 said re-winding roll will travel at the same speed as the feed roller 15 and thus wind up the web into roll form.

In case it is desired to cause both the severing mechanism and the feeding mechanism to become inoperative, as, for example, when cards or individual sheets are fed one by one to the printing mechanism, the pawl 21 on the pawl-carrier 20 is withdrawn from engagement with the ratchet wheel 18 and the pawl 64 on the reciprocating member 58 is moved into the position shown in dotted lines in Fig. 2.

Having described the details of construction of our improved web-feeding and severing mechanism, we will now describe the operation of same.

When the type-carrier 1 of the printing machine moves downwardly to print that portion of the web which lies on the platen 3, the pawl-carrier 20 will be moved downwardly and the movable cutter 51 will be depressed to sever the web. When the type-carrier 1 moves upwardly the pawl-carrier 20 will also move upwardly and the pawl 21 thereon will engage the ratchet wheel 18 and thus actuate the roller 15 so as to feed the web a certain distance, the distance the web is fed corresponding to the length of the slips that are formed by severing the web. These operations are repeated automatically so long as the printing machine continues in operation so that the web is printed and severed into short lengths or strips, each of which contains the impression of the type on the type-carrier 1. The roller 16 is held in yielding engagement with the roller 15 by means of the springs 40 that exert pressure on the bearings or levers 38 in which the shaft of the roller 16 is journaled, and when it is desired to separate the rollers 15 and 16 the arms 44 are swung on their fulcrums so that the inclined faces on the lower ends thereof engage the stationary pins 47 and thus cause the arms 38 to move upwardly.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a web-feeding and severing mechanism for printing machines, a feed roller, a cutting device, a pawl-carrier provided with a pawl that coöperates with a ratchet on the feed roller to actuate same, and mechanism operated by said pawl-carrier for actuating said cutting device; substantially as described.

2. In a web-feeding and severing mechanism for printing machines, a feed roller provided with a ratchet wheel, a pawl-carrier

provided with a pawl that coöperates with said ratchet wheel to move the feed roller, a reciprocating cutting device, a rock shaft for actuating said device, and mechanism operated by the pawl-carrier for oscillating said rock shaft; substantially as described.

3. In a web-feeding and severing mechanism for printing machines, a feed roller, a cutting device, a rock shaft for actuating the cutting device, means for feeding said roller intermittently, and mechanism operated by said roller-feeding means for imparting movement to said rock shaft; substantially as described.

4. In a web-feeding and severing mechanism for printing machines, a feed roller, a cutting device, a rock shaft for actuating said cutting device, a pawl-carrier forming part of the mechanism for feeding said roller, a reciprocating member actuated by said pawl-carrier, and means on said reciprocating member for operating the rock shaft; substantially as described.

5. In a web-feeding and severing mechanism for printing machines, a feed roller, a reciprocating cutting device, a rock shaft for actuating said cutting device, mechanism for feeding said roller, a reciprocating member operated by said mechanism, a tappet connected to said rock shaft, and means on said reciprocating member for moving said tappet in opposite directions so as to depress and elevate the cutting device; substantially as described.

6. In a web-feeding and severing mechanism for printing machines, a feed roller, a cutting device, a rock shaft for actuating said cutting device, a tappet connected to said rock shaft, a reciprocating member provided with a lug that engages a pin on said tappet to move it in one direction, a pivotally mounted pawl on said reciprocating member adapted to engage a second pin on said tappet to move it in the opposite direction, means for actuating said roller, and means for operating said reciprocating member; substantially as described.

7. In a web-feeding and severing mechanism for printing machines, a feed roller, a cutting device, mechanism for actuating said roller, a reciprocating member adapted to be operated by said mechanism, and means operated by said reciprocating member for raising and depressing said cutting device; substantially as described.

8. In a web-feeding and severing mechanism for printing machines, a feed roller provided with a ratchet wheel, a pawl-carrier provided with a pawl that engages said ratchet wheel and imparts movement thereto, a toothed segment on said pawl-carrier, a reciprocating member having rack teeth that mesh with said segment, a cutting device, a rock shaft for actuating said cutting device, said reciprocating member being provided with a slot through which one end of said rock shaft projects, a tappet connected to said rock shaft and provided with a plurality of lateral projections, a spring-actuated pawl on said reciprocating member cooperating with one of the projections on said tappet to move the rock shaft in one direction, means for disengaging said pawl from said projection, and means on the reciprocating member coöperating with the other projection on the tappet for moving the rock shaft in the opposite direction; substantially as described.

9. A web feeding and severing attachment for printing machines, comprising a frame that is adapted to be detachably connected to one end of the bed plate of a printing machine, a feeding mechanism carried by said frame, and a severing mechanism carried by said frame; substantially as described.

10. A web-feeding and severing attachment for printing machines, consisting of a frame that is adapted to be detachably connected to one end of the bed plate of a printing machine, a support detachably connected to said frame, a stationary cutter secured to said support, guides on said support, a reciprocating cross-head mounted on said guides and provided with a movable cutting member that coöperates with said stationary cutter, and mechanism carried by said frame for actuating said movable cutting member; substantially as described.

11. In a machine of the character described, a drive shaft, a pair of feed rollers between which a web or continuous strip is adapted to pass, a cutting device, means operated by said drive shaft for actuating one of said feed rollers, a reciprocating member for actuating said cutting device, and mechanism operated by said drive shaft for moving said reciprocating member intermittently; substantially as described.

12. In a machine of the character described, mechanism for feeding a continuous strip or web, means for severing said web, a guide roller arranged between the severing mechanism and the web supply for keeping the web taut, means for bodily moving or shifting said guide roller to vary the length of that portion of the web that extends between the source of supply and the severing mechanism, and means for causing the feeding mechanism to feed the web intermittently and the severing mechanism to cut the web into short lengths; substantially as described.

13. In a machine of the character described, a drive shaft, feed rolls, a movable cutting device, mechanism operated by the drive shaft for actuating said feed rolls and said cutting device intermittently and at different periods in the cycle of operations of the machine, said mechanism being so constructed that the feed roll and cutting de-

vice will remain at rest while the drive shaft continues in operation; substantially as described.

14. In a web-feeding and severing mechanism for printing machines, a feed roller, a cutting device, a rock shaft for actuating said cutting device, a tappet on said rock shaft, a movable member coöperating with said tappet to move the rock shaft in opposite directions, means for feeding said roller intermittently, and means for operating said movable member intermittently; substantially as described.

15. In a web-feeding and severing mechanism for printing machines, a feed roller, means for actuating said feed roller, a cutting device, a rock shaft for actuating said cutting device, a tappet on said rock shaft, a reciprocating member, means on said reciprocating member for engaging said tappet and moving it in one direction, and independent means on said member for engaging said tappet and moving it in the opposite direction; substantially as described.

16. In a machine of the character described, an intermittently operating feeding mechanism for feeding a web, a cutting device for severing the web, a rock shaft for actuating said cutting device, a tappet on said rock shaft provided with a plurality of lateral projections, a reciprocating member provided with a pawl for engaging one of said projections so as to move said rock shaft in one direction, and means on the reciprocating member for engaging the other projection on the tappet so as to move the rock shaft in the opposite direction; substantially as described.

17. In a machine of the character described, an intermittently operating feeding mechanism for feeding a web, a cutting device for severing the web, a rock shaft for actuating said cutting device, a tappet on said rock shaft provided with a plurality of lateral projections, a reciprocating member provided with a pawl for engaging one of said projections so as to move said rock shaft in one direction, means on the reciprocating member for engaging the other projection on the tappet so as to move the rock shaft in the opposite direction, and means for automatically disengaging said pawl from the projection with which it coöperates when the reciprocating member reaches a certain point; substantially as described.

In testimony whereof, we hereunto affix our signatures, in the presence of two witnesses, this 2nd day of January, 1909.

MILES H. MANN.
WEBB M. OUNGST.
WALTER M. OUNGST.

Witnesses:
WELLS L. CHURCH,
GEORGE BAKEWELL.