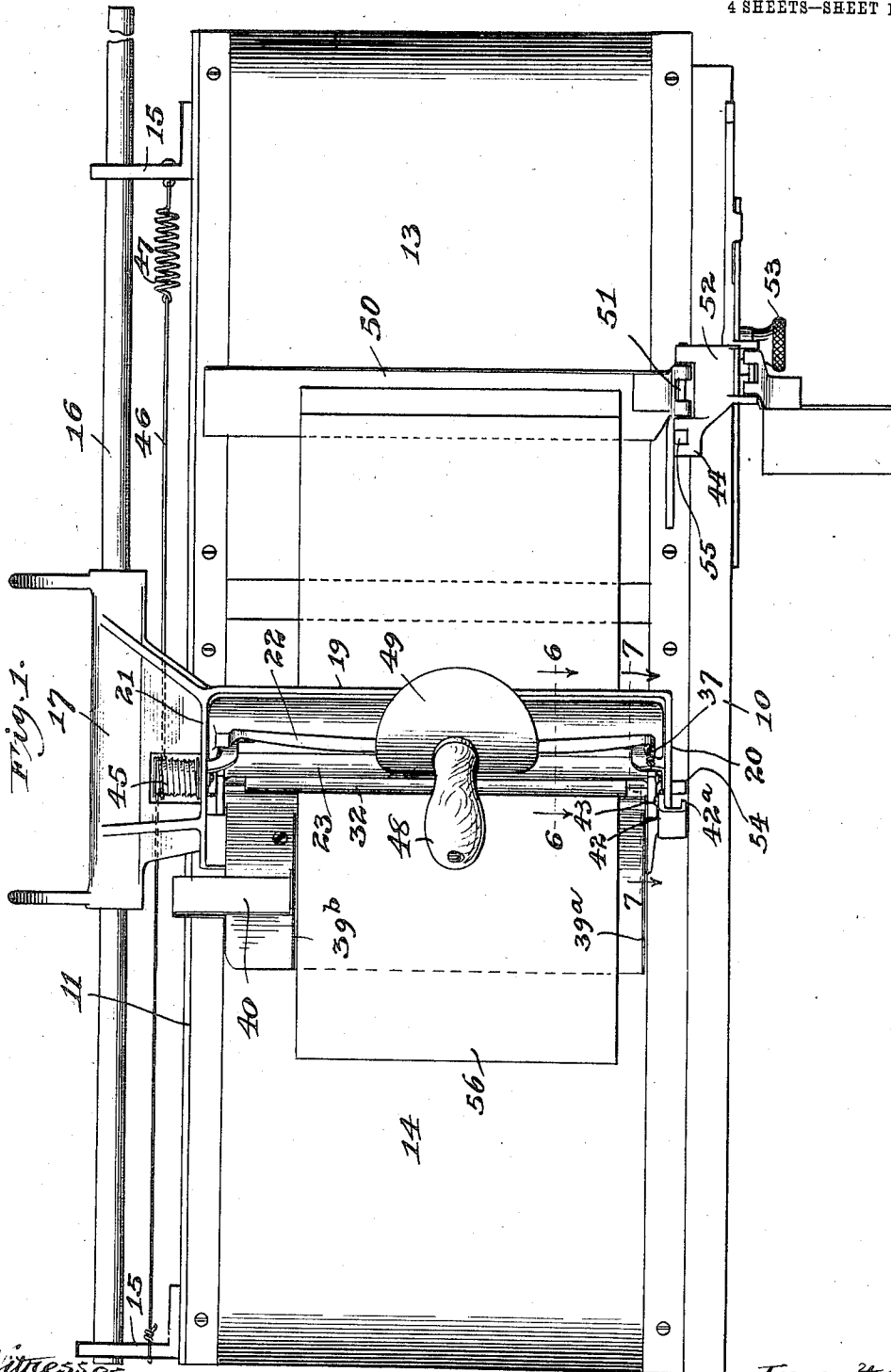


J. J. FLANIGAN.
COPYING MACHINE.
APPLICATION FILED SEPT. 22, 1909.

1,019,312.

Patented Mar. 5, 1912.

4 SHEETS—SHEET 1.



Witnesses
J. B. Mann
S. N. Pond

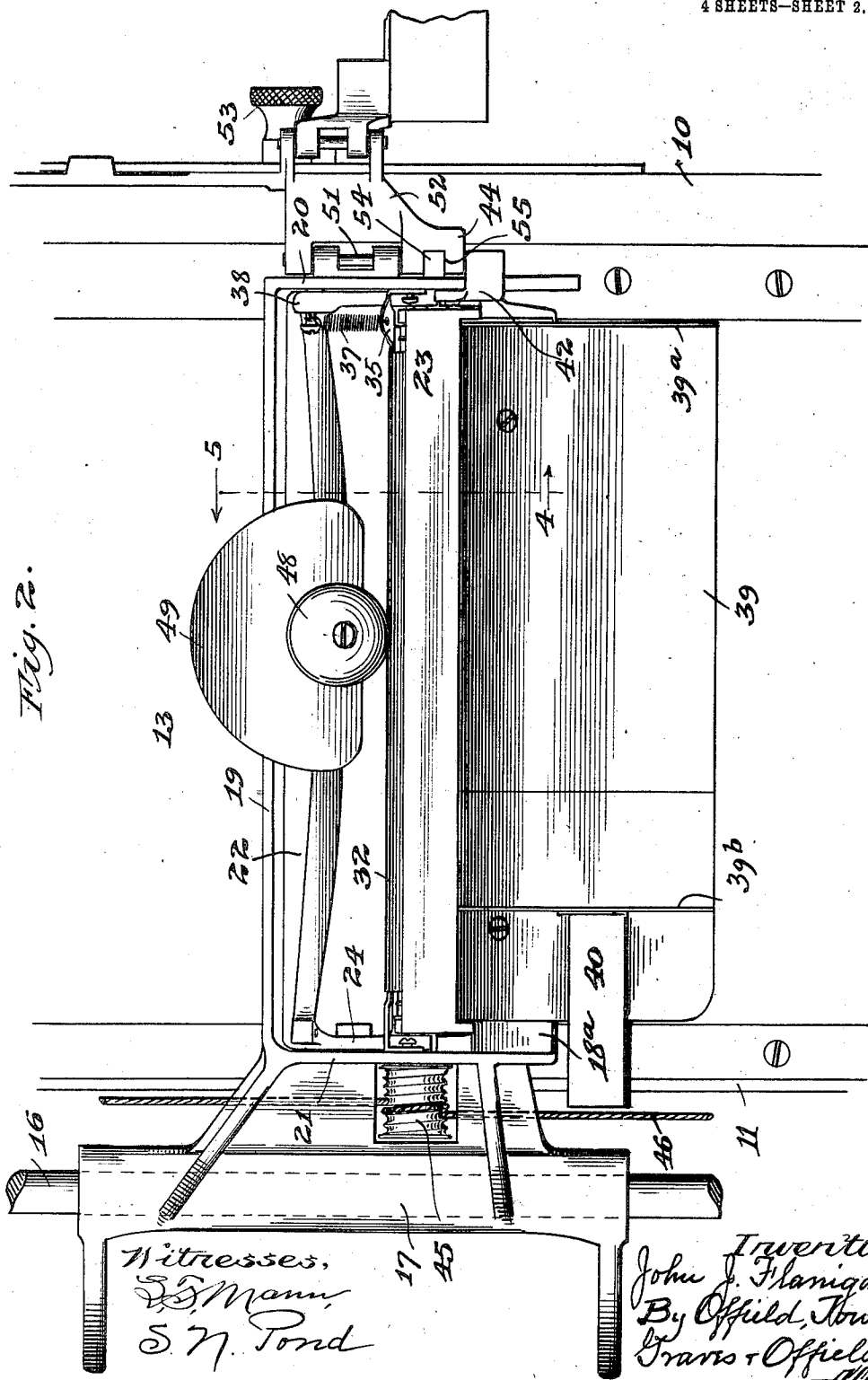
Inventor:
John J. Flanigan,
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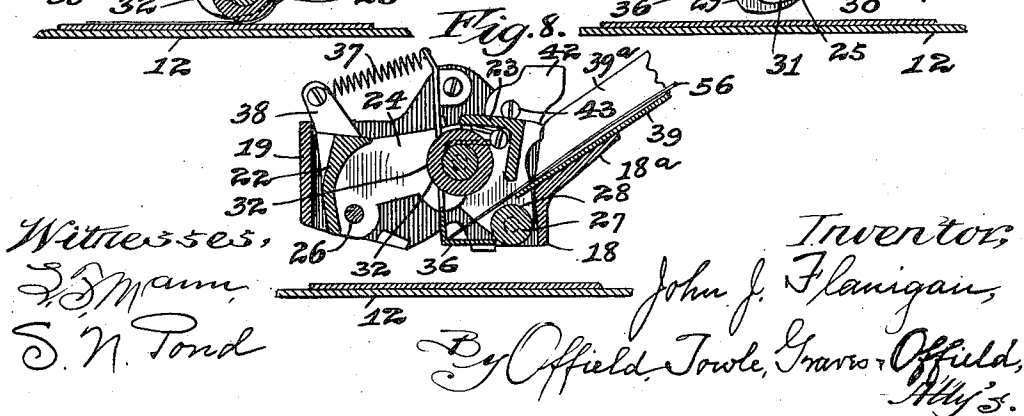
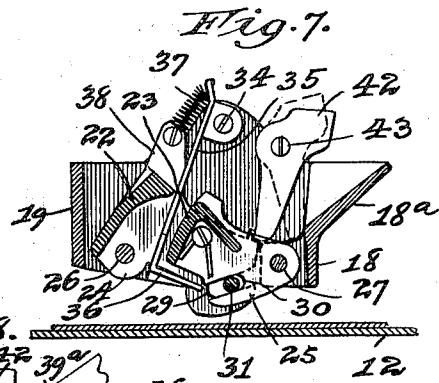
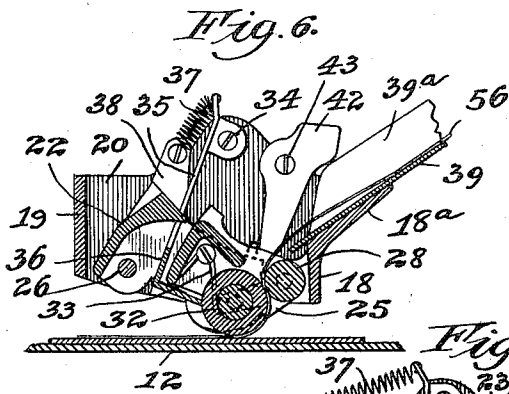
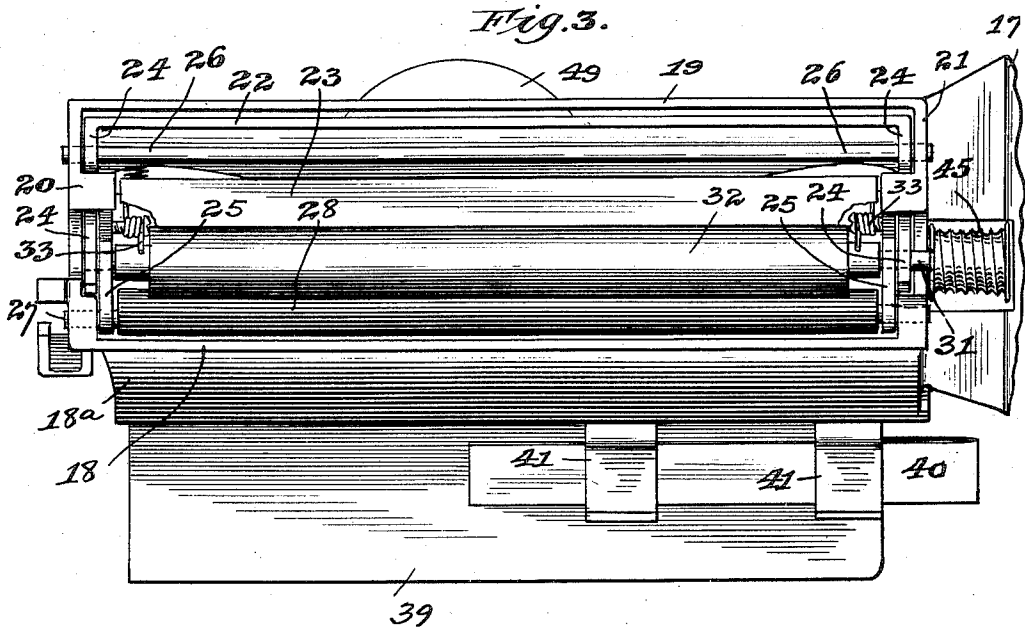
4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

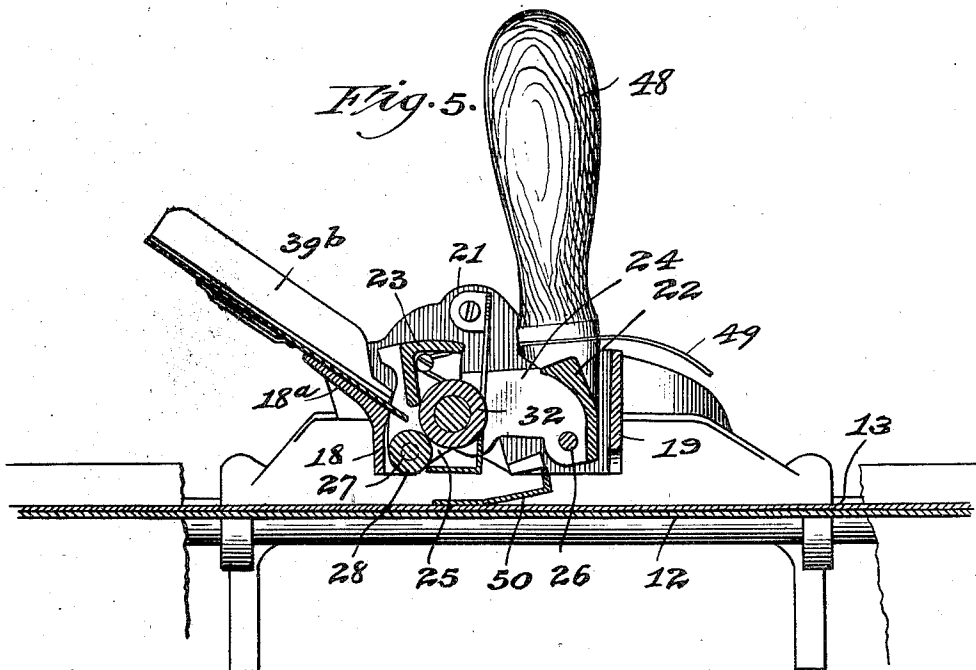
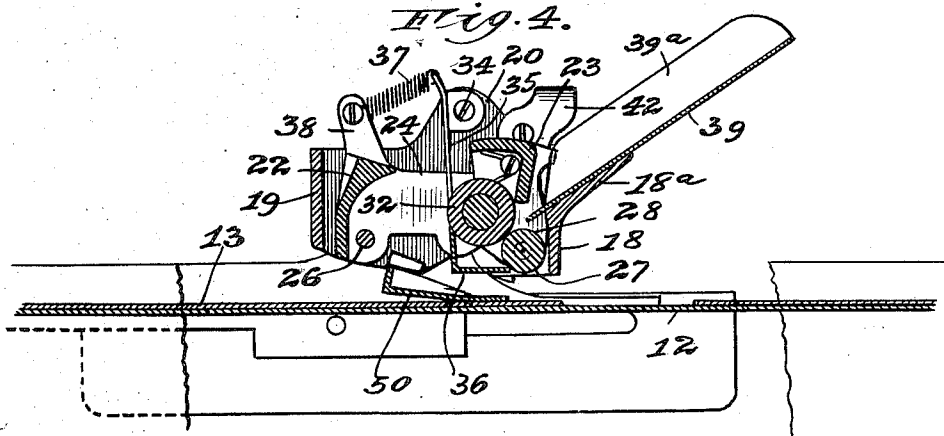


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4 SHEETS—SHEET 4.



Witnesses,
S. M. Mann,
S. N. Pond

Inventor,
John J. Flanigan,
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UNITED STATES PATENT OFFICE.

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COPYING-MACHINE.

1,019,312.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed September 22, 1909. Serial No. 518,989.

To all whom it may concern:

Be it known that I, JOHN J. FLANIGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Copying-Machines, of which the following is a specification.

This invention relates to the art of multiple copying machines, or hectographs, as they are sometimes called, and has reference more particularly to a new and improved device including a roller platen for impressing the original and copy sheets upon the gelatinized duplicating band or other surface which receives the imprint of the record from the original sheet and transfers it to the copy sheets.

My invention has been designed primarily as a simplified improvement upon the roller platen disclosed in Letters Patent Number 965,887, granted to me on the 2nd day of August, 1910, on a multiple copying machine; but it will be readily understood that it is capable of application to and use in connection with any copying machine employing a duplicating surface suitably supported to permit of the passage of a platen roller thereover.

In the machine of my patent, above referred to, the roller platen is of such a nature that the impressed portion of the paper sheet is rolled up thereon as the platen advances over the band; whereas, in my present device, the impressed portion of the paper sheet remains in flat contact with the band until the platen roller makes its return movement.

The device of my present invention comprises as to its chief structural features a suitable frame mounted to move bodily on a slideway of the duplicating machine and equipped with a pair of parallel rolls or their equivalents normally lying in surface contact with each other, between which the paper sheet containing the matter to be transferred to the duplicating band is passed, one of said rolls being fixedly journaled in the frame, and the other (which is preferably a rubber or rubber-surfaced roll) being journaled in angularly movable arms whereby, through suitable connection to an operating handle, said last named roll may be retracted from the fixed roll to admit the edge of the sheet between said rolls and may then, in surface contact with said

fixed roll, be moved bodily toward and from the duplicating band. The spindle of this bodily movable roll is equipped with means for effecting its positive rotation during the travel of the frame over the duplicating band in both directions, so as to not only insure the positive feed of the paper sheet through the platen frame during the forward travel of the latter and the positive discharge of the paper sheet on the return or backward movement of the platen frame, but also to impress the sheet upon the duplicating band during both the forward and return travel of the platen frame.

In connection with the rolls aforesaid, the device also includes an automatically acting lock which maintains the impression or platen roll in working position during both the forward and return travel of the platen frame and releases said roll at the completion of the return travel so as to permit it to be withdrawn from contact with the fixed roll for the subsequent insertion of a fresh sheet.

Still another feature resides in the provision of a pivoted gage-bar which coöperates with the forward or advance edge of the sheet to square the latter relatively to the duplicating band, and also forms a stop whereby to insure the introduction of the forward edge of the sheet to the proper amount or extent.

Still another feature which I preferably employ to prevent sticking of the upper blank edge of the sheet to the duplicating band, consists of a shield in the nature of a thin flat strip or bar that overlies the duplicating band and forms a rest or support for the upper blank edge of the sheet when the latter is impressed upon the duplicating band by the platen roll.

Other minor agents and accessories contributing to the efficiency and utility of the device will be pointed out and explained in the following detail description of its several parts and its manner of operation.

In the accompanying drawings I have illustrated one practical form in which the invention may be embodied, and referring thereto,—

Figure 1 is a top plan view of the frame and duplicating band of a copying machine, showing my improved roller platen mounted and operating thereover, the platen frame being shown in working position.

Fig. 2 is a similar view on an enlarged scale, showing only a portion of the machine frame and duplicating band, and showing the movable parts of the device in the relative positions assumed when the impression roll has been raised out of contact with the duplicating band but not separated from the fixed roll. Fig. 3 is a bottom plan view of the platen with the parts in the positions assumed when the impression roll is in its lowermost or working position. Figs. 4 and 5 are cross-sectional views on the line 4—5 of Fig. 2, looking in opposite directions, as indicated by the arrows. Figs. 6 and 7 are cross-sectional views on the lines 6—6 and 7—7, respectively, of Fig. 1. Fig. 8 is a cross-sectional detail similar to Figs. 4 and 6, but showing the relative positions of the parts when the rolls are separated and with a sheet of paper introduced between them.

Referring to the drawings, 10 and 11 designate the opposite side-frame members of the copying machine, and 12 a horizontal platform or table supported by and between said side-frame members and itself constituting a rest or support for the usual gelatin duplicating band. I have herein shown the machine as equipped with a pair of such duplicating bands 13 and 14, similar to the independently operable duplicating bands disclosed in my aforesaid patent. However, these parts of the apparatus are not material to the present invention, but are illustrated merely for the sake of making clearer the purpose and mode of operation of the latter.

Supported in brackets 15 secured to side-frame 11 is a rod 16 that constitutes a support and slideway for a carriage 17 secured to or integral with which is a substantially rectangular frame member formed with parallel side walls 18 and 19 and parallel end walls 20 and 21. Pivotaly mounted within and between the end walls 20 and 21 of this rectangular frame are a pair of substantially bail-shaped yokes or frames comprising parallel bars 22 and 23 which extend lengthwise of the containing frames and are formed at their ends with arms 24 and 25, respectively, extending at right angles thereto. The arms 24, carrying the bar 22, are pivoted near their inner ends at 26 to the end walls 20 and 21, just inwardly of the frame wall 19, and the arms 25, carrying the bar 23, are pivoted near their outer ends at 27 just inwardly of the frame wall 18 (Fig. 7). The pivots 27 constitute the reduced ends of a fixed roll 28 that extends between the arms 25. The arms 24 and 25 at each end of the device partially overlap each other, and their overlapping portions are formed with marginal notches 29 and 30, respectively, best shown in Fig. 7, which notches constitute movable bearings for the reduced ends or spindles 31 of the impres-

sion or platen roll 32, said spindles 31 in turn, constituting in effect a hinged connection between the arms 24 and 25, whereby when either pair of arms is rocked, the other is simultaneously rocked. The impression roll 32 is normally urged into surface contact with the fixed roll by torsion springs 33, as best shown in Figs. 3 and 6, said springs bearing upon the reduced end portions of the roll.

Pivoted at 34 to the upper ends of the end walls 20 and 21 are a pair of arms 35 which support between them an angle-bar 36 that constitutes a gage-bar and stop to determine and limit the insertion of the sheet between the rolls 32 and 28, as well as to square the end of the sheet when so inserted. One of the arms 35 is connected at its upper end above its pivot 34 by a tension spring 37 to an arm 38 rigid with one of the roll-carrying arms 24 so that, when these latter are elevated, as shown in Fig. 8, to separate the rolls 28 and 32 for the insertion of the sheet, the gage-bar 36 is thereby swung into operative position opposite the space between said rolls to receive and square the forward edge of the paper sheet, in the manner clearly indicated in Fig. 8.

The upper portion of the side wall 18 of the frame is outwardly flared or inclined, as shown at 18^a, thereby forming a suitable support for a guide-chute 39 which directs the entrance and discharge of the paper sheet. This guide-chute has a fixed wall 39^a on one side, and on the opposite side a movable wall 39^b carried by a bent supporting clip 40 which embraces the adjacent end of the base-plate of the chute, being slidably supported and guided in keepers 41 on the under side of the latter, as plainly shown in the bottom plan view, Fig. 3.

As above stated, the roller platen of my invention is designed to impress the paper sheet upon the gelatin sheet during both its forward and return travel. To insure such action of the impression roller, I provide a device in the nature of a lock which, when the impression roller is lowered to working position, automatically locks the same in said working position and maintains it therein until automatically released at the end of the return travel of the platen frame to its original starting position. This device, as herein shown, consists of a gravity latch 42 that is pivoted at 43 on one side of a vertical line passing through its center of gravity to the inner face of the end wall 20 of the frame, its lower end normally overlying the upper edge of one of the roll-carrying arms 24; whereby, when said arm is in lowered position, as shown in Figs. 6 and 7, the lower end of the latch automatically swings over the upper edge of the arm 24, thus locking the impression roll 32 in working position, as shown in Fig. 6. The latch

42 has a depending extension on its upper end overlying the upper edge of the wall 20, which extends below the pivot 43, and this extension, coming in contact with a fixed stop 44 attached to the side-frame of the machine, swings the latch out of locking engagement with the roller-supporting frame, and thus permits the latter to be rocked so as to raise the impression roll to the intermediate or fully elevated positions for the discharge of the used sheet and the introduction of a fresh sheet.

The spindle 31 of the impression roll is, as best shown in the bottom plan view, Fig. 3, extended beyond the end wall of the frame and terminates in a spirally grooved spool 45 that engages a cord 46 (Fig. 1) secured and extending between the brackets 15 and having interposed therein a tension spring 47. The engagement of the spool with this cord, on the to and fro bodily travel of the platen, rotates the impression roll in an obvious manner, thus feeding the sheet between the rolls 28 and 32, as well as pressing said sheet by a rolling contact upon the gelatin sheet of the copying machine.

Rigidly secured to and rising centrally from the bar 22 is an operating handle 48 equipped with a shield 49, by which handle the impression roll is manipulated, and the entire platen frame itself is actuated to and fro above the gelatin sheet.

I preferably employ in connection with the mechanism thus far described, a shield or guard-strip overlying the copying apron of the machine and adapted to support and shield the upper marginal portion of the sheet from contact with the sticky gelatinous copying band. This guard-strip, designated by 50, is hinged at 51 to a bracket 52 that is clamped to the side-frame member 10 in any suitable manner, as by a clamp-screw 53. The bracket 52 has formed integral therewith a stop 44 hereinbefore referred to as coöperating with the downwardly turned extension 42^a of the latch 42; and, in order to gage the starting point of the roller platen at a uniform position relatively to the copying apron, I preferably provide a projecting lug 54 on the end wall 20 of the platen frame, which lug is adapted to register with and pass through a correspondingly shaped notch 55 in the stop-member 44 as the platen frame is swung downwardly into operative position above the shield 50.

In the operation of the device, the platen frame having been placed at its initial or starting position, as represented in Fig. 2, the handle 48 is swung back to the limit of its movement, thus separating the rolls 28 and 32, in which movement the wall 19 of the frame is struck by the arm 38, thus constituting a stop for limiting the extent of

backward swing of the arm and consequent separation of the rolls. The paper sheet, indicated in Figs. 1, 6 and 8 at 56, is then inserted between the separated rolls, as indicated in Fig. 8, being supported on the guide-chute 39 and squared by contact of its advance edge with the gage-bar 36. Upon releasing the backward pressure upon the handle, the springs 33 and 37 at once act to return the parts to the relative positions shown in Figs. 4 and 5, in which the rolls 28 and 32 grip the paper sheet between them. The platen frame is then lowered by the handle 48 to full working position by dropping the lug 54 through the notch 55, and the handle is then pressed forwardly to the position indicated in Fig. 1, which lowers the impression roll 32 to the working position indicated in Fig. 6, wherein it presses the paper sheet upon the surface of the duplicating band. The entire platen frame is then pushed forwardly, the cord 46 and spool 45 imparting a rotary movement to the impression roll at just such a speed as is necessary to cause it to roll without slipping over the surface of the paper as the latter is thus fed down between the rolls 32 and 28. As the handle is swung forwardly, carrying the impression roll down into working position, the latch 42 automatically drops into locking position over the upper edge of one of the arms 24, so that the parts are thereby locked in the relative positions indicated in Fig. 6. The advance movement is continued until the space occupied by the printed matter on either the sheet or the duplicating band has been passed over, and then the platen frame is returned, the impression roll being still held locked in lowered or working position. The platen frame is then returned, the impression roll, during the return travel, rotating, of course, in the opposite direction, so as to feed the sheet upwardly, but at the same time repeating the pressure upon the sheet and thereby the better insuring the transfer of the record from the sheet to the apron or from the apron to the sheet, as the case may be, than where but a single impression is made. As the platen frame reaches approximately its initial or starting position, the depending extension 42^a of the latch 42 strikes the bracket 44, thereby releasing the locking effect of the latch 42 upon the roller-carrying devices and permitting the handle 48 to be swung backwardly for the removal of the sheet and the introduction of a fresh sheet.

The shield 50 is not indispensable, but where employed prevents the upper edge of the sheet from sticking to the apron, so that the latter is readily withdrawn after the impression roll has been raised.

I claim:

1. In a copying machine, the combina-

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tion with a frame adapted to move bodily over the duplicating surface of the copying machine, of a stationary roller mounted in said frame, a platen roller carried by said frame, means for actuating said platen roller bodily toward and from said stationary roller and also toward and from said duplicating surface, and a gage-bar serving to arrest and square the advance edge of a sheet inserted between said rollers, substantially as described.

2. In a copying machine, the combination with a frame adapted to move bodily over the duplicating surface of the copying machine, of a stationary roller mounted in said frame, a platen roller carried by said frame, means for actuating said platen roller bodily toward and from said stationary roller and also toward and from said duplicating surface, a movable gage-bar, and operating connections between the latter and the actuating means of said platen roller whereby, when said rollers are separated for the insertion of a sheet of paper between them said gage-bar is simultaneously moved to a position to arrest and square the advance edge of the sheet, substantially as described.

3. In a copying machine, the combination with side-frame members and a duplicating surface mounted therebetween, of a platen-frame movable bodily over said duplicating surface, means carried by said platen-frame for gripping and impressing a sheet of paper upon said duplicating surface, and a narrow shield or guard-strip overlying said duplicating surface and adapted to shield the upper marginal portion of the sheet from contact with said duplicating surface when said sheet is impressed upon the latter, substantially as described.

4. In a copying machine, the combination with side-frame members and a duplicating surface mounted therebetween, of a platen-frame movable bodily over said duplicating surface, means carried by said platen-frame for gripping and impressing a sheet of paper upon said duplicating surface, a bracket adjustably secured to one of said side members, a shield or guard strip carried by said bracket and overlying said duplicating surface, said guard strip adapted to shield the upper marginal portion of the sheet from contact with said duplicating surface, and positioning devices carried by said platen frame and bracket, respectively, for determining the initial or starting position of said platen frame relatively to said guard strip and duplicating surface, substantially as described.

5. In a copying machine, the combination with a frame adapted to move bodily over the duplicating surface of the copying machine, of a stationary roller mounted in

said frame, a yoke pivotally mounted in said frame and having an operating handle, and an impression roller mounted in and between the arms of said yoke and adapted to be moved by the latter toward and from said stationary roller, substantially as described.

6. In a copying machine, the combination with a frame adapted to move bodily over the duplicating surface of the copying machine, of a pair of yokes having at each end overlapping arms pivoted in said frame and formed with registering marginal notches, a stationary roller mounted between the arms of one of said yokes coaxially with the pivots thereof, an impression roller journaled in the registering notches of said arms, spring means normally urging said impression roller toward said stationary roller, and an operating handle mounted on the other of said yokes whereby said impression roller may be separated from said stationary roller to admit a paper sheet between them, and may be depressed to a position to rollingly impress said sheet upon said duplicating surface, substantially as described.

7. In a copying machine, the combination with a frame adapted to move bodily over the duplicating surface of the copying machine, of a pair of yokes having at each end overlapping arms pivoted in said frame and formed with registering marginal notches, a stationary roller mounted between the arms of one of said yokes coaxially with the pivots thereof, an impression roller journaled in the registering notches of said arms, spring means normally urging said impression roller toward said stationary roller, an operating handle mounted on the other of said yokes whereby said impression roller may be separated from said stationary roller to admit a paper sheet between them, and may be depressed to a position to rollingly impress said sheet upon said duplicating surface, and means for imparting rotation to said impression roller as the platen is moved over said duplicating surface, substantially as described.

8. In a copying machine, the combination with a frame adapted to move bodily over the duplicating surface of the copying machine, of a stationary roller mounted in said frame, a yoke pivotally mounted in said frame, an impression roller mounted in and between the arms of said yoke, an operating handle on said yoke whereby said impression roller may be separated from said stationary roller to admit a sheet of paper between them, and may subsequently be depressed to rollingly impress said sheet upon said duplicating surface, a movable gage-bar, and operating connections between the latter and said yoke whereby when said rollers are separated said gage-bar is moved to a position

tion to arrest and square the advance edge of the sheet, and, when said impression roll is depressed, said gage-bar is moved out of the path of movement of said impression roller, substantially as described.

5 9. In a copying machine, the combination with a frame adapted to move bodily over the duplicating surface of the copying machine, of a stationary roller mounted in said frame, a yoke pivotally mounted in said frame, an impression roller mounted in and between the arms of said yoke, an operating handle on said yoke whereby said impression roller may be depressed to rollingly impress said sheet upon said duplicating surface, and an automatic lock for retaining said impression roller in depressed position, substantially as described.

10 10. In a copying machine, the combination with a frame member adapted to move bodily over the duplicating surface of the

copying machine, of a stationary roller mounted in said frame, a yoke pivotally mounted in said frame, an impression roller mounted in and between the arms of said yoke, an operating handle on said yoke whereby said impression roller may be depressed to rollingly impress said sheet upon said duplicating surface, a latch pivoted to said frame and adapted, when said impression roller is depressed, to automatically override and lock an arm of said yoke in depressed position, said latch having an extension adapted to engage a suitable stop upon the return of the platen to initial position, whereby to release its locking effect upon said yoke and impression roller, substantially as described.

JOHN J. FLANIGAN.

Witnesses:

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