

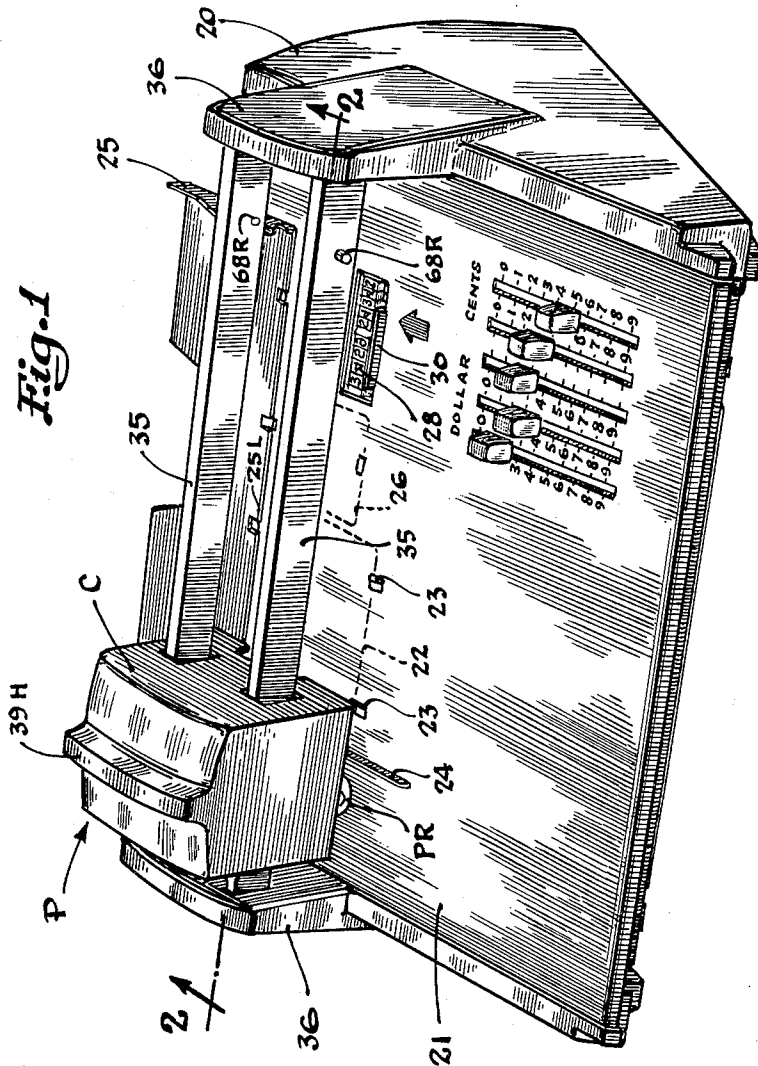
July 24, 1962

G. H. HILL ETAL
PRINTING MACHINES

3,045,589

Filed June 10, 1959

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

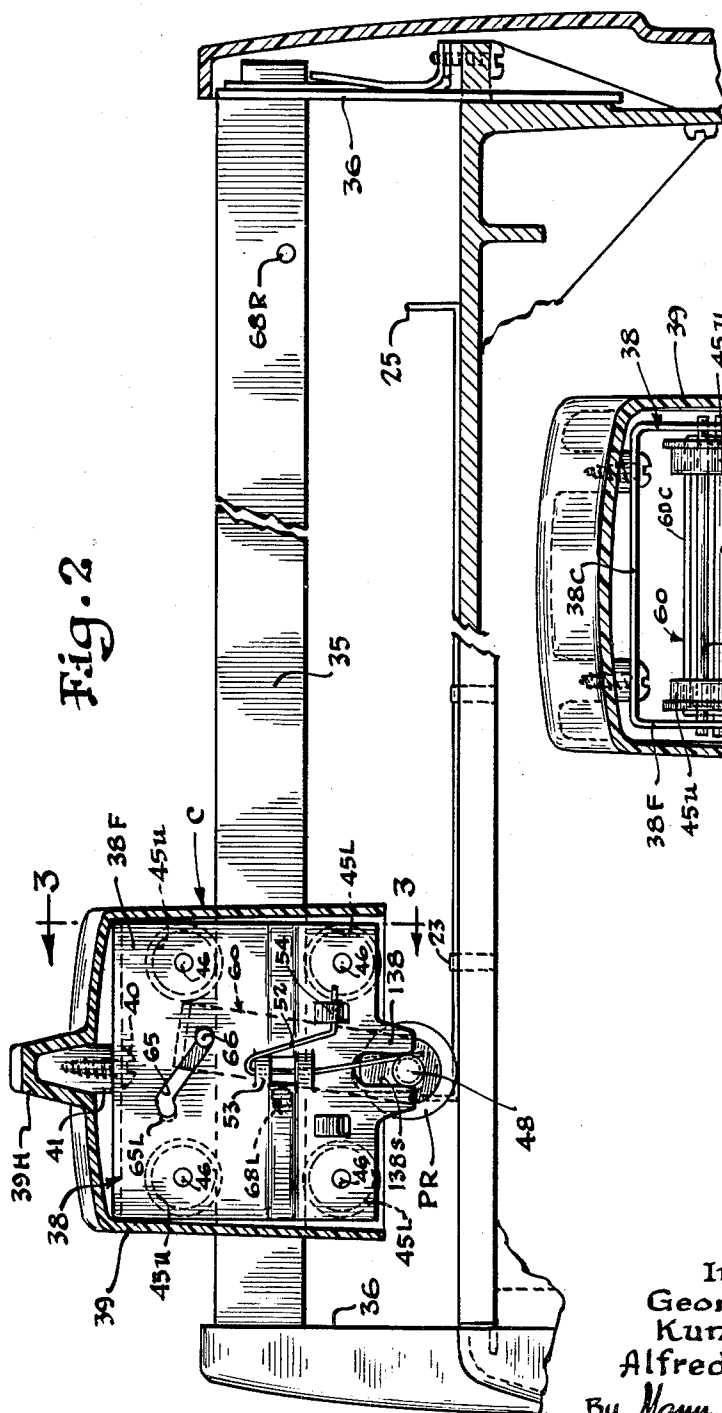


Fig. 2

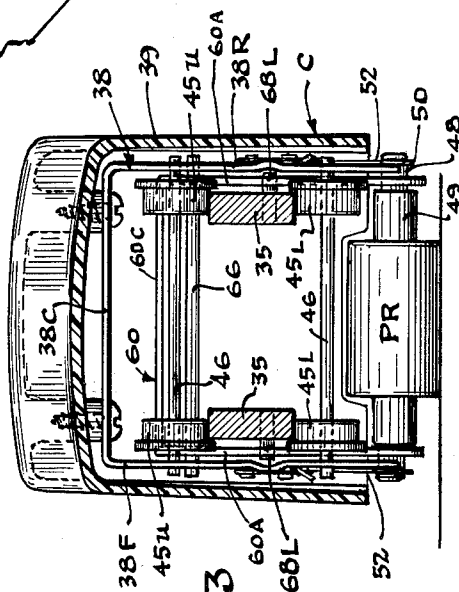


Fig. 3

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4 Sheets-Sheet 3

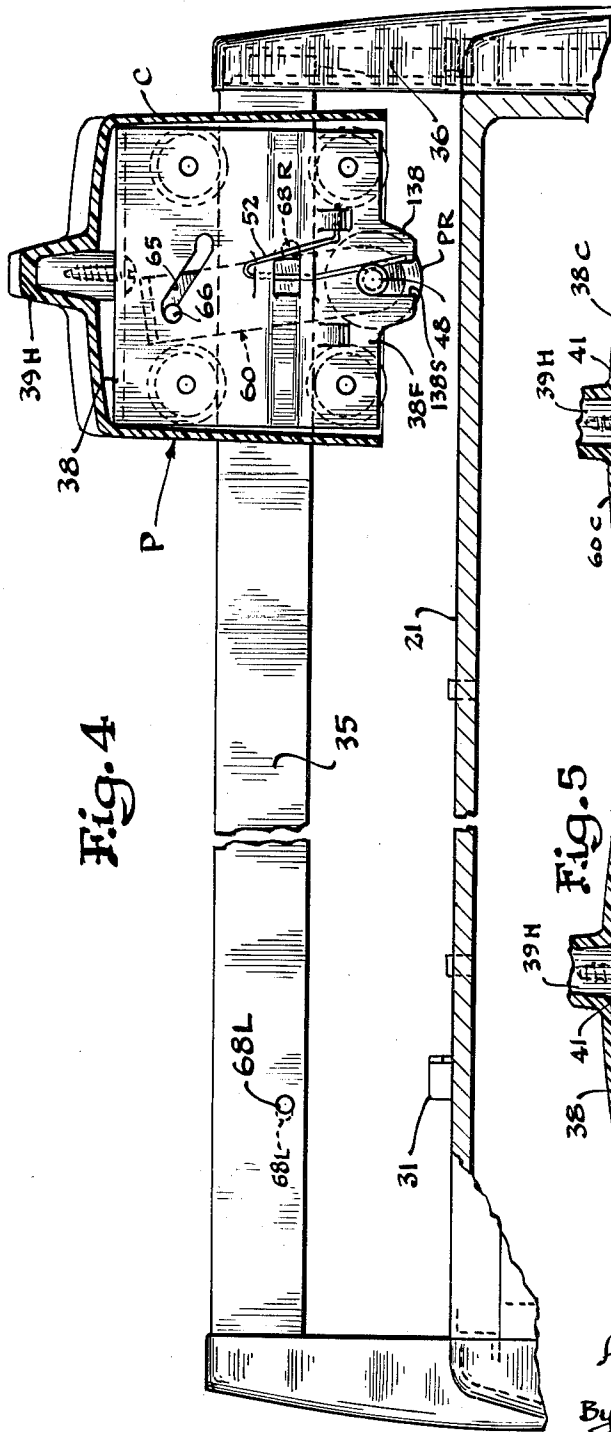


Fig. 4

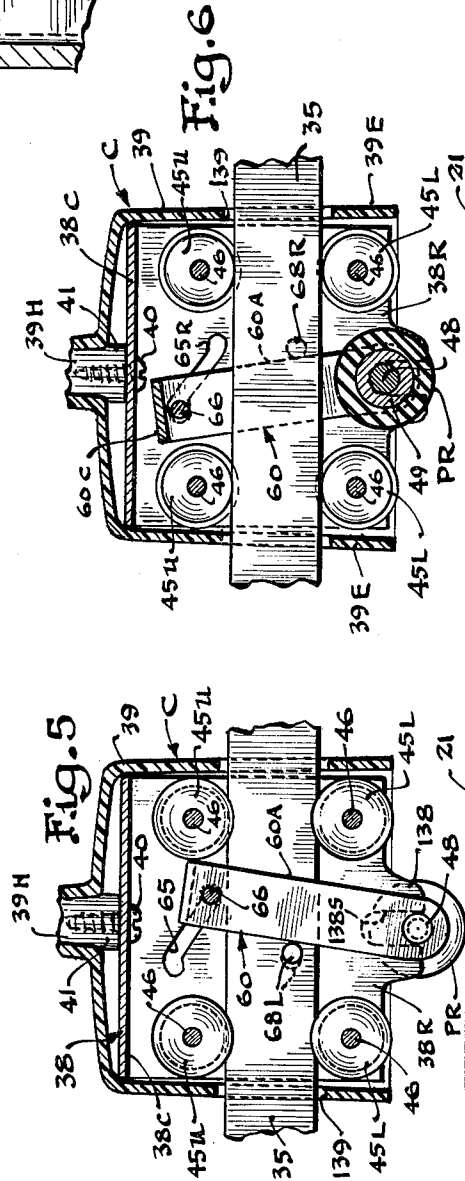


Fig. 6

Fig. 5

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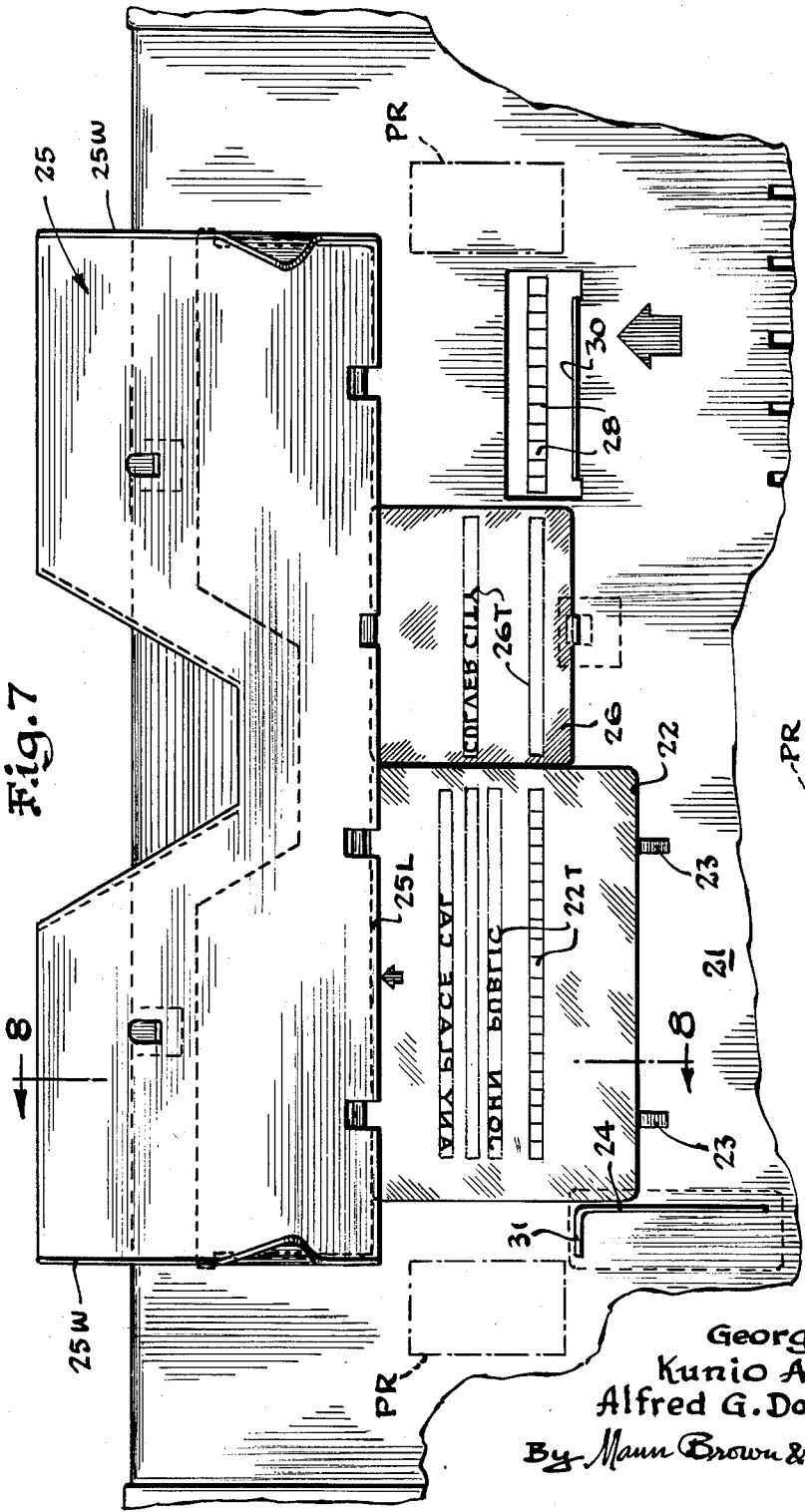
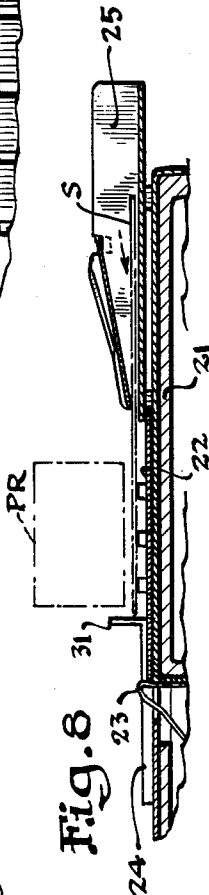
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4 Sheets-Sheet 4



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3,045,589

PRINTING MACHINES

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11 Claims. (Cl. 101—56)

This invention relates to printing machines, and particularly to platen mechanism for use in such machines.

In printing machines of the kind wherein impressions are made from replaceable individual printing devices it has long been the practice to use a roller platen that is moved with a rolling action across the printing area to press the paper into printing cooperation with the printing means. To obtain the best and sharpest printed impression it has been recognized that the platen roller should make but a single rolling pass in contact or printing cooperation with the sheet, and in printing machines of the kind usually used for address printing and the like it has been customary to provide rather complex shifting mechanism for the platen roller so that the roller is maintained in an elevated or ineffective position while it is moved in one direction over the printing area and is then lowered into an effective printing relation in which it is maintained while the platen is moved in the opposite or return direction. At or near the end of such return movement, the platen roller is returned to its elevated relation.

The cost and complexity of such prior platen control mechanisms has however been such that they could not be used in small hand operated printing machines of the kind used for credit card and like printing operations. As a result, resort has been had in such small machines to platen control means which raised the platen roller at each end of its stroke while maintaining the roller in its lower position in the main portion of the stroke. This has resulted in machine operation that is not uniform in each printing use of the machine. In other words, in successive uses of the machine, the platen is shifted in the opposite directions, and this tends to be confusing to the user to the extent that it is considered to be objectionable.

In view of the foregoing it is the primary object of the present invention to enable the platen roller of the printing machine to be raised at one end and lowered at the other end of the platen stroke by means of a simple and reliable character. Related objects are to provide such a raising and lowering mechanism for the platen roller of a printing machine which is cam-operated in character and which is automatically actuated in one direction or the other as the platen structure moves into its respective terminal positions. Another object of this invention is to provide a platen actuating mechanism that is simple in form and which may be manufactured and assembled at a reasonable cost and which in use is extremely rugged so as to withstand long and continued use in the field.

Another object of the present invention is to provide a platen structure that is particularly adapted for use with carbon impression forms and which acts to aid in accurately locating the sheets or forms against the paper stops and which also acts to produce an improved carbon impression and to cause the carbon to release more freely from the sheet upon which the impression has been made.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings, which, by way of illustration, show a preferred embodi-

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ment of the present invention and the principles thereof, and what is considered to be the best mode in which to apply these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the invention.

In the drawings:

FIG. 1 is a front perspective view of a printing machine having a platen mechanism embodying the features of the invention;

FIG. 2 is an enlarged front elevational view of the platen mechanism, the view being taken partly in section along the line 2—2 of FIG. 1;

FIG. 3 is a transverse cross sectional view of the platen mechanism, the view being taken along the line 3—3 of FIG. 2;

FIG. 4 is a view similar to FIG. 2 and showing the platen roller in its retracted or elevated position;

FIG. 5 is a front elevational view of the platen mechanism showing the platen roller in its lowered or printing relation;

FIG. 6 is a view similar to FIG. 5 and showing a platen roller in its raised or elevated position;

FIG. 7 is a plan view of the bed of the printing machine showing the printing means with which the platen roller is to cooperate; and

FIG. 8 is a fragmentary vertical cross sectional view taken substantially along the line 8—8 of FIG. 7.

For purposes of disclosure the invention is herein illustrated as embodied in a platen mechanism P that includes a platen roller PR that forms part of a printing machine 20. The printing machine 20 has a main body that provides an upwardly and rearwardly sloping top surface or bed 21 that extends beneath the platen mechanism P and upon which printing means may be supported for printing cooperation with the platen mechanism in producing printed impressions on a sheet S, FIG. 8, or a group of sheets, disposed on the bed 21 and between the printing means and the platen mechanism P. While the platen mechanism P of the present invention may be utilized in cooperation with bed structures of many different kinds, the machine 20 that is herein shown constitutes a credit card printing machine adapted for use in stores, filling stations and the like for printing sales slips from embossed credit cards such as the card 22 shown in FIGS. 7 and 8. Such credit cards have one or more lines of embossed type 22T and may be supported in position on the bed 21 by means such as springs or detents 23 engaging the lower edge of the printing device 22, an end guide 24 engaging one end each of the printing device, and an overhanging ledge 25L that constitutes the lower edge of a sheet guide tray 25. Additional printing means may be mounted in association with the bed 21, and as shown in FIG. 7, such additional means include an embossed plate 26 upon which embossed characters 26T are provided for identifying the particular establishment in which the printing machine 20 is used. Further printing means may take the form of a plurality of settable type wheels 28 mounted in the bed in an exposed relation so that an upper row of printing characters on such wheels 28 are exposed in the same print plane as the type characters 22T and 26T.

The paper guide tray 25, as shown particularly in FIGS. 1, 7 and 8, is located along the upper or rear edge of bed 21 so that a sheet S upon which a printed impression is to be made may be inserted face down and in a forward direction into the tray 25 so as to be positioned in an endwise sense by upstanding end walls 25W of the tray, and the forward movement of sheet S may be continued until the lower edge of the sheet S engages a stop 30 that is located just below or forwardly

of the type wheels 28, and a stop 31 that is formed as the rear end of the guide 24. When the sheet S has thus been put into position, the machine is in condition for printing operation, and this is accomplished by reciprocating the platen mechanism P back and forth across the printing area that is defined by the location of the several printing means.

The platen mechanism P comprises a carriage C upon which the platen roller PR is mounted, and the carriage C is supported and guided for movement along rectilinear guide means that extend across and above the printing area. Such rectilinear guide means as herein shown are provided by a pair of spaced parallel guide rails 35 that are supported at their opposite ends by columns 36, such columns 36 extending upwardly from opposite ends of the base of the machine.

The guide rails 35 are rectangular in cross sectional form and are supported so as to be spaced from each other in a front to rear direction and so as to locate the upper and lower edges parallel and in an equally spaced relationship with respect to the bed 21. Thus, as the carriage C is moved back and forth along the guide rails 35, the carriage moves in a parallel relationship to the bed 21 and to the printing plane defined by the several embossed type characters or other printing means.

The carriage C is arranged to carry the platen roller PR with its axis located parallel to the bed 21 and transversely of the path of movement of the carriage C, and as will be described in detail hereinafter, the platen roller PR is associated with actuating means whereby in the course of reciprocating movements of the carriage C, the platen roller may be shifted back and forth between its raised or inactive relation of FIG. 6 and the lowered or printing relation of FIG. 5.

The platen roller PR as herein shown is of the inkless kind, and in the machine 20 with which it has been associated, is intended and adapted to produce the desired printed impressions through the use of carbon sheets or areas associated with the sheets S upon which the impressions are to be made.

In providing for movably supporting and guiding the carriage C on the rails 35, and for supporting and actuating the platen roller PR, the carriage C has an internal frame 38 formed as a relatively wide sheet metal stamping having upper cross bar 38C and front and rear downwardly projecting side walls 38F and 38R. The internal rigid frame 38 has an external cover 39 that may be made from the material such as plastic so as to house substantially all of the frame, and across its top wall, the housing 39 has an upstanding rib-like handle 39H to facilitate grasping of the carriage C when it is desired to impart movement thereto along the supporting rails 35. The internal frame 38 is connected to the housing by screws 40 that are extended upwardly through the top wall 38C and into the bosses 41 that are integrally formed with the housing 39.

The housing 39 has end walls 39E, as will be evident in FIGS. 4 to 6, and these end walls have openings 139 formed therein through which the supporting rails 35 extend with substantial clearance. Within the housing 39 and between the two walls 38F and 38R, means are provided for supporting and guiding the carriage C on the two rails 35. As herein shown, such means comprise two sets or pairs of upper flanged wheels 45U and two sets or pairs of lower flanged wheels 45L so that the lower surface of each rail 35 is engaged at spaced points by two flanged wheels 45L, while the upper surface of each rail 35 is engaged by, at spaced points, two flanged wheels 45U. Each set or pair of wheels is mounted loosely on a shaft 46 that extends through aligned and properly positioned openings in the front and rear walls 38F and 38R, and which also extends through the axial openings of the pair of wheels.

As will be evident in FIG. 3 of the drawings, the wheels have their flanges engaged with what may be termed the

outer or remote side edges of the rails 35 with which they are engaged so that as to each such pair of wheels, the flanges of the wheels prevent movement of the wheels toward each other, and hence the tread surfaces of the wheels are maintained in proper engagement with the opposed edges of the rails. The proportioning of the parts is such that the wheels cannot move any appreciable distance away from each other without engaging the adjacent wall 38F or 38R. Thus the wheels and the several mounting shafts 46 may be quickly and easily assembled before the rigid frame 38 is put in position within the housing 39. Then when the housing 39 is put in place about the frame 38, the front and rear walls of the housing are spaced but a short distance from the ends of the several shafts 46 so that these shafts are held in proper assembled relation despite the fact that some slight longitudinal movement of the shafts may take place.

In providing the mounting and actuating means for the platen roller PR, the front and rear walls 38F and 38R of the rigid internal frame 38 are provided with spaced downwardly extending ears 138 which serve to define a vertically extending slot 138S in aligned positions in the respective front and rear walls. The slots 138S serve as guide means for a removable mounting shaft 48 which serves to support the platen roller PR. Thus the platen roller PR has extended coaxial sleeve portions 49 at its opposite ends so that these sleeve portions have their ends in substantial engagement with the front and rear walls of the internal frame, as will be evident in FIG. 3, and the shaft 48 extends through an axial opening formed in the platen roller and its extended sleeves 49. The mounting shaft 48 is held in its proper axial position by means that engage annular slots 50 that are formed near opposite ends of the shaft and just outside of the front and rear walls 38F and 38R. Such retaining means as herein shown comprise hairpin springs 52 mounted on the outside of each of the front and rear walls. Thus, as shown in FIG. 2, the front wall 38F has a pair of strap-like members 53 formed therein so as to provide what amounts to a vertical passage through which one arm of the hairpin spring 52 may be inserted in a downward direction, and the lower end portion of this arm of the hairpin spring 52 is arranged to engage the annular slot 50 of the mounting shaft 48. The other arm of the hairpin spring 52 is hooked under a retaining lug 54 that is struck from the wall. Thus the bayonet spring 52 provides a readily releasable retaining means, and the shaft 48 may be moved up and down within the range of the slot 137S since the engaged arm of the spring 52 extends in a generally up and down direction and may be subjected to slight bending as the shaft 48 is moved up and down.

The position of the shaft 48 in the slots 137S is established by means that are connected to opposite ends of the shaft 48 and which may be rocked about the axis of the shaft 48 to impart up and down shifting movements to the shaft 48. Thus, as shown particularly in FIGS. 2 to 6, a strap-like bail 60 is formed from sheet metal to provide an upper or a cross member 60C and a pair of downwardly extending arms 60A. The length of the cross member 60C is such that the arms 60A may extend downwardly along the outer or remote sides of the front and rear walls 38F and 38R, thus to extend between these walls and the respective guide rails 35. At their lower ends, the arms 60A have aligned openings therein through which the shaft 48 is extended in a fairly snug but rotatable relationship. Thus the shaft 48 may be moved up and down by moving the bail 60 upwardly or downwardly, and with the present invention such upward or downward movements of the bail are imparted thereto as an incident to rocking movement of the bail in one direction or the other about the axis of the shaft 48. Thus, the present invention provides interacting means associated with the internal rigid frame 38 and the bail 60 so that as the bail is rocked in clockwise direction to

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the position shown in FIG. 5, the bail 60 and the platen roller PR are moved downwardly to locate the platen roller in its lower or effective relation, while rocking of the bail 60 in a counterclockwise direction to the position shown in FIG. 6 results in raising the platen roller PR to its inactive position of FIG. 6. The means for accomplishing the upward and downward shifting movement of the platen roller PR are in the nature of cam means. Thus the front and rear walls 38F and 38R have similar and aligned cam slots 65 formed therein, and these cam slots are engaged by opposite ends of a shaft 66 that extends through the two arms 60A of the bail 60 just below the cross member 60C, and the ends of the shaft 66 extend through the cam slots 65 for a substantial distance so that the spacing of the walls of the cover 39 will serve to prevent undesired displacement of the shaft 66 in an endwise direction.

In attaining the particular operation of the platen roller PR as above described, the slots 65 are arranged so that their left hand ends are higher than the righthand ends of the slots, and at the upper or lefthand ends these slots 65 have a short angularly related downward extension 65L, while at the lower or righthand end the slots 65 have a short angularly related extension 65R, which as shown in FIG. 6 extends substantially horizontally.

The function of the extension 65L and 65R of the cam slots is to insure that the cam follower that is provided by the shaft 66 remains in position at one end or the other of the slots 65 until such time as a positive shifting force is applied to the bail 60 in a direction longitudinal of the guide rails 35. Thus as indicated in several figures in the drawings, abutment means are provided on the rails 35 for engagement by the bail 60 in the terminal portion of its movement in either direction. In providing such means as herein shown the rails 35 have similarly located abutment pins 68R mounted thereon in adjacent right-hand ends, while abutment pins 68L are fixed in the rails 35 near the lefthand ends thereof, and these abutment pins 68L and 68R are so disposed that they lie in the path of the arms 60A. Thus, as the carriage C is shifted to the left, the arms 60A will be moved against the pins 68L and the bail 60 will thereafter be held against further lefthand movement at the point where the bail engages the pins 68L. The lower end of the bail 60 will, however, continue to move to the left as the shifting movement of the carriage C continues, and the net result of such relative movement is that the cam follower 66 is moved in a righthand direction relative to the cam slots 65. This causes the bail 60 to be shifted in a downward direction so that the platen roller PR is moved to its lower or printing relationship, and this position is shown in FIGS. 2 and 5 of the drawings. When the follower 66 reaches the righthand end of the cam slot 65 its movement stops, and the movement of the carriage C is stopped. The platen roller PR has thus been conditioned for printing operation as the carriage C returned in a righthand direction along its supporting tracks 35.

In such return or righthand movement, the platen roller PR produces a printed impression from the text of the printing means, and the upward forces exerted on the platen roller PR are such that the follower 66 is held in the desired position in the extensions 54R of the cam slots 65. When the printing of the impression has been completed, the continued movement of the carriage C to the right causes the bail 60 to engage and in effect be stopped by the abutment pin 68R. Since the righthand movement of the carriage C may continue, the bail is caused to move through a relatively shifting movement in a counterclockwise direction to the position shown in FIG. 6, and the movement of the cam follower 66 along the cam slots 65 cause the bail to be shifted upwardly to cause the platen roller PR to be retracted to the position in FIG. 6. The engagement of the follower shaft 66 with the left hand end of the cam slot 65,

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the movement of the bail 60 is stopped so that the carriage C is stopped in its right hand terminal position of FIG. 4. As the follower shaft 66 reaches the end of this shifting movement, it drops somewhat downwardly into the angularly related extension 65L of the cam slots, and the platen roller PR is thus effectually mounted in its raised or retracted position when the carriage C is again shifted to the left in a printing cycle.

The upward and downward shifting movements take place just beyond the opposite ends of the printing area, as will be evident in FIG. 7 where the platen roller PR has been indicated in dotted outline at the respective locations where the shifting movements take place.

With the platen mechanism that has thus been provided, the normal cycle of use of the printing machine involves the insertion of the printing device 22 in a rearward direction along the guide 24 until the rear edge of the printing device is located under the ledge 25L, at which time the printing device will move past the spring detents 23 which will snap up into position to hold the printing device in the desired location on the bed 21. The form or sheet S is then inserted forwardly and downwardly into the tray 25 so that it is guided in its forward movement until such time as it engages the front paper stops 30 and 31. The printing machine is then in condition for the actual printing operation, and the printing operation is accomplished by a back and forth motion of the carriage C along the tracks 35. Thus at the completion of a printing operation the carriage C is located in the same position that it occupies before the printing operation, and this is considered to be important because it enables the user to establish a routine mode of operation which can be rapidly performed. Actually the initial position of the platen P may be determined by the user according to his particular desires in the matter, because in either of the terminal positions of the carriage C, the platen roller PR is located beyond the adjacent end of the printing area so that insertion of the printing device 22 and the insertion of the sheet S may be accomplished with equal facility whether the carriage C is in its right hand or left hand terminal position.

The platen mechanism of the present invention has the axis of its platen roller disposed at a slight angle to the path of movement of the carriage C, and by this arrangement it has been found that improved carbon impressions may be made with an improved releasing action between the carbon sheet and the printed sheet, and its has also been found that improved registration of the impression has been attained because the slightly angular disposition of the axis of the platen roller causes the platen roller to urge the sheet or form edgewise into engagement with the paper stops 30 and 31. Thus, as shown particularly in FIGS. 2, 4 and 5, the slot 138S that is formed in the rear frame plate 38R is displaced slightly to left with respect to the slot 138S of the front frame plate 38F. Similarly, the cam slot 65 in the rear frame plate is displaced slightly to the left as indicated in FIG. 2 with respect to the slot 65 in the front frame plate 38F. This disposes the axis of the platen roller PR at a slight angle to the longitudinal axis of movement of the carriage C, so that when the platen is being moved to the right through its printing stroke, the front edge of the platen roller PR which is closest to the paper stops 30 and 31 is in effect located in a leading relation with respect to the rear edge of the platen roller. Because of this slight angularity of the axis of the platen roller, pins 68L and 68R in the rear one of the guide bars 35 are offset slightly to the left with respect to the pins of the forward guide bar 35, thus to cause the pins to be engaged simultaneously by the front and rear arm 60A.

By the arrangement that is thus provided, movement of the platen carriage C to the right from its position shown in FIG. 2 causes the platen roller to impart a slight ironing or working action to the form or sheet S so that

carbon impressions are obtained that are sharp and clear, and the carbon sheet is effectually released from the sheet upon which the carbon impression has been made. Moreover, the angular location of the platen roller causes the form to be held tightly against the paper stops 39 and 31 so as to insure an accurately located impression on the form.

The mechanism through which the shifting of the platen roller is accomplished under this invention is extremely simple and rugged in character, and it produces a highly desirable cycle of platen shifting movements despite the simplicity of the shifting mechanism.

Thus while a preferred embodiment of the invention has been illustrated and described, it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appending claims.

We claim:

1. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear guideway extending across said printing area in an upwardly spaced relation thereto, a carriage mounted on said guideway for reciprocation back and forth across said printing area, a platen roller beneath said carriage with its axis parallel to said bed and transversely of the path of travel of the carriage, means including a bail rockable about the axis of the platen roller supporting said platen roller for movement between a lower printing relation and a raised ineffective relation, cam means located in part on the carriage and in part on the bail acting between upper end portions of said bail and the carriage for shifting the platen roller upwardly when the bail is rocked in one direction and for shifting the platen roller downwardly when the bail is rocked in the other direction, and stop means on said guideway for engagement by said bail to impart rocking movement to said bail in opposite directions when the carriage reaches the respective ends of its stroke.

2. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear guideway extending across said printing area in an upwardly spaced relation thereto, a carriage mounted on said guideway for reciprocation back and forth across said printing area, a platen roller beneath said carriage with its axis parallel to said bed and transverse with respect to the path of travel of the carriage, means including a rocking arm movable through limited rocking movements about the axis of the platen roller and supporting said platen roller for movement between a lower printing relation and a raised ineffective relation, cooperating cam means including cooperating parts located respectively on the bail and on the carriage acting between said arm and the carriage for shifting the platen roller downwardly when the arm is rocked in the other direction, and stop means on said guideway for engagement by said arm to impart rocking movement to said arm in opposite directions when the carriage reaches the respective ends of its stroke.

3. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear trackway extending across and in parallel relation to said printing area and in an upwardly spaced relation thereto, said trackway providing parallel upper and lower faces and parallel front and rear faces, a rigid carriage frame providing a top wall disposed above the trackway and front and rear walls extending downwardly past the front and rear faces of the trackway, flanged wheels disposed inside of said front and rear walls for rolling movement along the upper and lower faces of the trackway and with flanges thereof engaging the front and rear faces of the trackway, said wheels being arranged

in pairs with two pairs above and two pairs below the trackway, supporting shafts for the several pairs of wheels extended loosely through the wheels and through the front and rear walls of the frame, a cover secured over said frame and having walls positioned to be engaged by opposite ends of said shafts to prevent material endwise displacement of the shafts, a platen roller beneath carriage frame with its axis parallel to said bed and transversely of the path of travel of the carriage frame, means including a rockable bail disposed within said carriage frame and supporting said platen roller for movement between a lower printing relation and a raised ineffective relation, cam slots formed in said front and rear walls, follower means on said bail engaging said slots for shifting the platen roller upwardly when the bail is rocked in one direction and for shifting the platen roller downwardly when the bail is rocked in the other direction, and stationary stop means for engagement by said bail to impart rocking movement to said bail in opposite directions when the carriage frame reaches the respective ends of the stroke.

4. A printing machine according to claim 3 wherein said stop means are provided by pins mounted on said trackway.

5. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear trackway extending across and in parallel relation to said printing area and in an upwardly spaced relation thereto, said trackway providing parallel upper and lower faces and parallel front and rear faces, a rigid carriage frame providing a top wall disposed above the trackway and front and rear walls extending downwardly past the front and rear faces of the trackway, flanged wheels disposed inside of said front and rear walls for rolling movement along the upper and lower faces of the trackway and with flanges thereof engaging the front and rear faces of the trackway, said wheels being arranged in pairs with at least two pairs engaging one of such faces, supporting shafts for the several pairs of wheels extended loosely through the wheels and through the front and rear walls of the frame, a cover secured over said frame and having walls positioned to be engaged by opposite ends of said shafts to prevent material endwise displacement of the shafts, a platen roller beneath carriage frame with its axis parallel to said bed and transversely of the path of travel of the carriage frame, and control means within said carriage frame supporting said platen roller for movement between a lower printing relation and a raised ineffective relation, cam slots formed in said front and rear walls and adapted to be actuated in one direction for shifting the platen roller upwardly and to be actuated in the opposite direction and for shifting the platen roller downwardly, and stop means in fixed position relative to said trackway for engagement by control means to shift said platen roller in opposite directions when the carriage frame reaches the respective ends of its stroke.

6. A printing machine according to claim 5 wherein said control means are provided in part by cam elements on the carriage frame.

7. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear trackway extending across and in parallel relation to said printing area and in an upwardly spaced relation thereto, said trackway providing parallel upper and lower faces and parallel front and rear faces, a rigid carriage frame providing a top wall disposed above the trackway and front and rear walls extending downwardly past the front and rear faces of the trackway, flanged wheels disposed inside of said front and rear walls for rolling movement along the upper and lower faces of the trackway and with flanges engaging the front and rear faces of the trackway, said wheels being arranged in pairs with two

pairs above and two pairs below the trackway, supporting shafts for the several pairs of wheels extended loosely through the wheels and through the front and rear walls of the frame, a cover secured over said frame and having walls positioned to be engaged by opposite ends of said shafts to prevent material endwise displacement of the shafts, a platen roller beneath carriage frame with its axis parallel to said bed and transversely of the path of travel of the carriage frame, means including a rockable bail disposed within said carriage frame and supporting said platen roller for movement between a lower printing relation and a raised ineffective relation, cam slots formed in said front and rear walls, a follower shaft extended loosely through said bail and said cam slots and engageable at its ends with said housing to maintain the follower shaft in position, said follower shaft cooperating with said slots for shifting the platen roller upwardly when the bail is rocked in one direction and for shifting the platen roller downwardly when the bail is rocked in the other direction, and stop means for engagement by said bail to impart rocking movement to said bail in opposite directions when the carriage frame reaches the respective ends of its stroke.

8. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear trackway extending across and in parallel relation to said printing area and in an upwardly spaced relation thereto, said trackway providing parallel upper and lower faces and parallel front and rear faces, a rigid carriage frame providing a top wall disposed above the trackway and front and rear walls extending downwardly past the front and rear faces of the trackway, flanged wheels disposed inside of said front and rear walls for rolling movement along the upper and lower faces of the trackway and with flanges thereof engaging the front and rear faces of the trackway, said wheels being arranged in pairs with two pairs above and two pairs below the trackway, supporting shafts for the several pairs of wheels extended loosely through the wheels and through the front and rear walls of the frame, a cover secured over said frame and having walls positioned to be engaged by opposite ends of said shafts to prevent material endwise displacement of the shafts, a platen roller beneath carriage frame with its axis parallel to said bed and transversely of the path of travel of the carriage frame, means including a bail disposed within said carriage frame, a shaft extended through said bail and platen roller for supporting said platen roller on the bail for movement by the bail between a lower printing relation and a raised ineffective relation, said last-mentioned shaft having an annular groove formed in one end outside of the bail, a resilient spring member mounted on one of the walls of the frame and extending in a generally up and down direction and yieldingly engaged with said groove to hold said last mentioned shaft against axial displacement, cam slots formed in said front and rear walls, follower means on said bail engaging said slots for shifting the platen roller upwardly when the bail is rocked in one direction and for shifting the platen roller downwardly when the bail is rocked in the other direction, and stop means for engagement by said bail to impart rocking movement to said bail in opposite directions when the carriage frame reaches the respective ends of its stroke.

9. A printing machine according to claim 3 wherein

paper stop means are provided on the bed for engagement by an edge of a sheet that is parallel to the guideway and wherein said platen roller is disposed so that during a printing stroke the end of the platen roller that is nearest the paper stop means travels slightly in advance of the other ends of the platen roller.

10. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear guideway extending across said printing area in an upwardly spaced relation thereto, a carriage mounted on said guideway for reciprocation back and forth across said printing area, paper stop means on the bed for engagement by an edge of a sheet that is parallel to the guideway, a platen roller beneath said carriage with its axis parallel to said bed and transversely of the path of travel of the carriage, support means supporting said platen roller for movement between a lower printing relation and a raised ineffective relation, cam means acting between said support means and the guideway for shifting the platen roller upwardly when the carriage reaches one end of its travel and for shifting the platen roller downwardly when the carriage reaches the other end of its travel, said platen roller being disposed in a slightly angular relation to said guideway to urge a sheet against said stops as the platen roller rolls over a sheet in printing cooperation with such sheet.

11. In a printing machine having a bed upon which printing means may be supported in a predetermined printing area, means rigid with said bed and providing a rectilinear guideway extending across said printing area in an upwardly spaced relation thereto, a carriage including a frame mounted on said guideway for reciprocation back and forth across said printing area, a platen roller beneath said carriage with its axis parallel to said bed and transversely of the path of travel of the carriage, a shaft extended for guiding the platen roller for up and down movement, means including a rockable bail through which said shaft extends at its opposite ends, means acting between said bail and the carriage frame for shifting the platen roller and said shaft upwardly when the bail is rocked in one direction about said shaft and for shifting the platen roller downwardly when the bail is rocked in the other direction, stop means on said guideway for engagement by said bail to impart rocking movement to said bail in opposite directions when the carriage reaches the respective ends of its stroke, said shaft having an annular groove formed therein, and resilient wire means mounted on the frame and having a generally vertical portion yieldingly engaging said groove to hold the shaft in position in said bail during up and down movements of said shaft and the bail.

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**UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION**

Patent No. 3,045,589

July 24, 1962

George H. Hill et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 9, line 66, for the claim reference numeral "3"
read -- 8 --.

Signed and sealed this 8th day of January 1963.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents