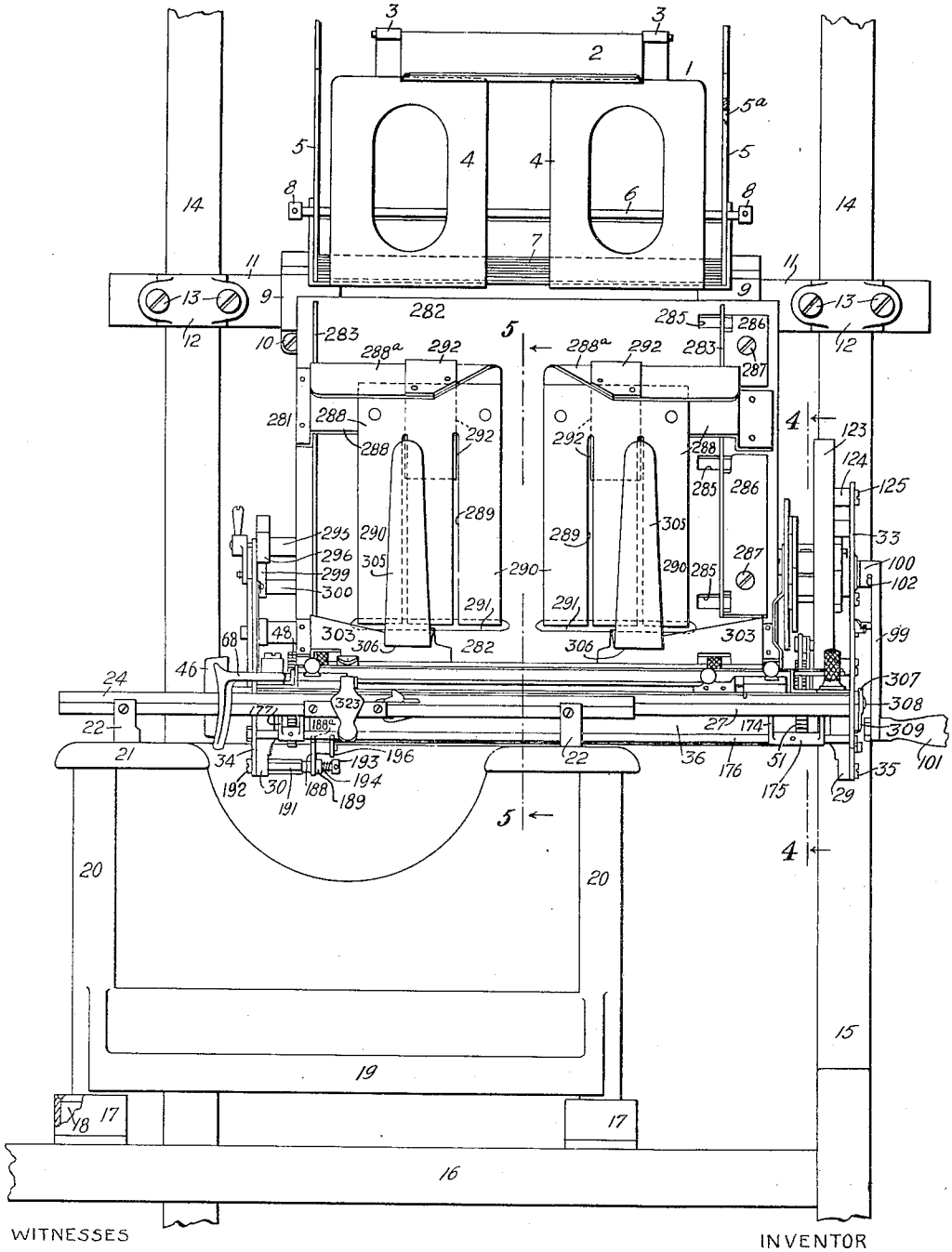
Aug. 22, 1933. E. E. BARNEY 1,923,771

TYPEWRITING MACHINE

Original Filed April 13, 1927 5 Sheets-Sheet 1

Fig. 1



WITNESSES

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TYPEWRITING MACHINE

Original Filed April 13, 1927 5 Sheets-Sheet 2

Fig. 9.

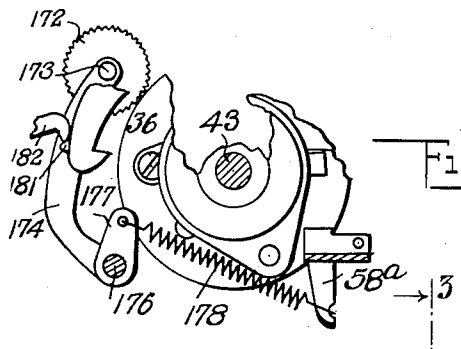


Fig. 2.

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TYPEWRITING MACHINE

Original Filed April 13, 1927 5 Sheets-Sheet 3

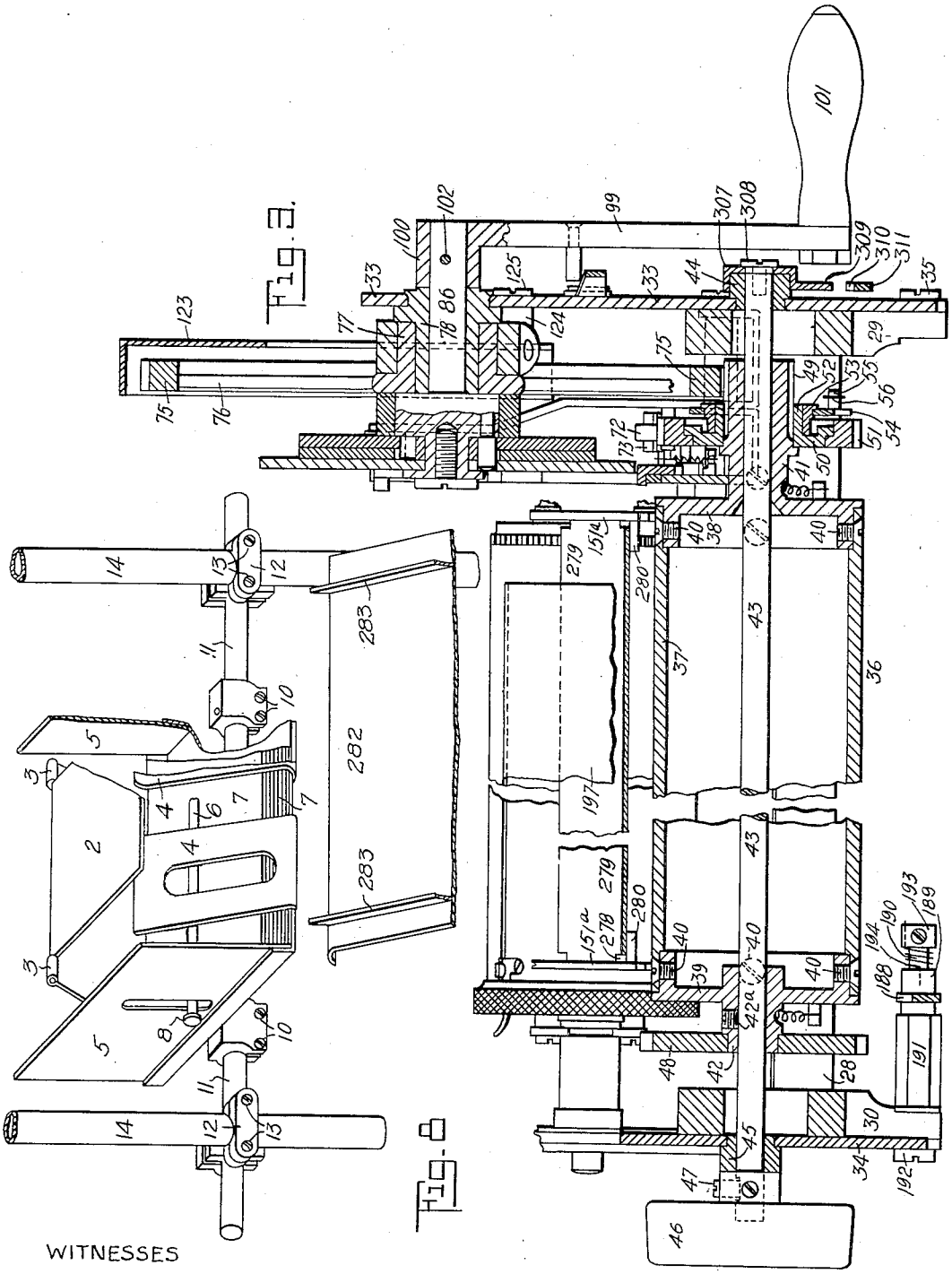


Fig. 8.

WITNESSES

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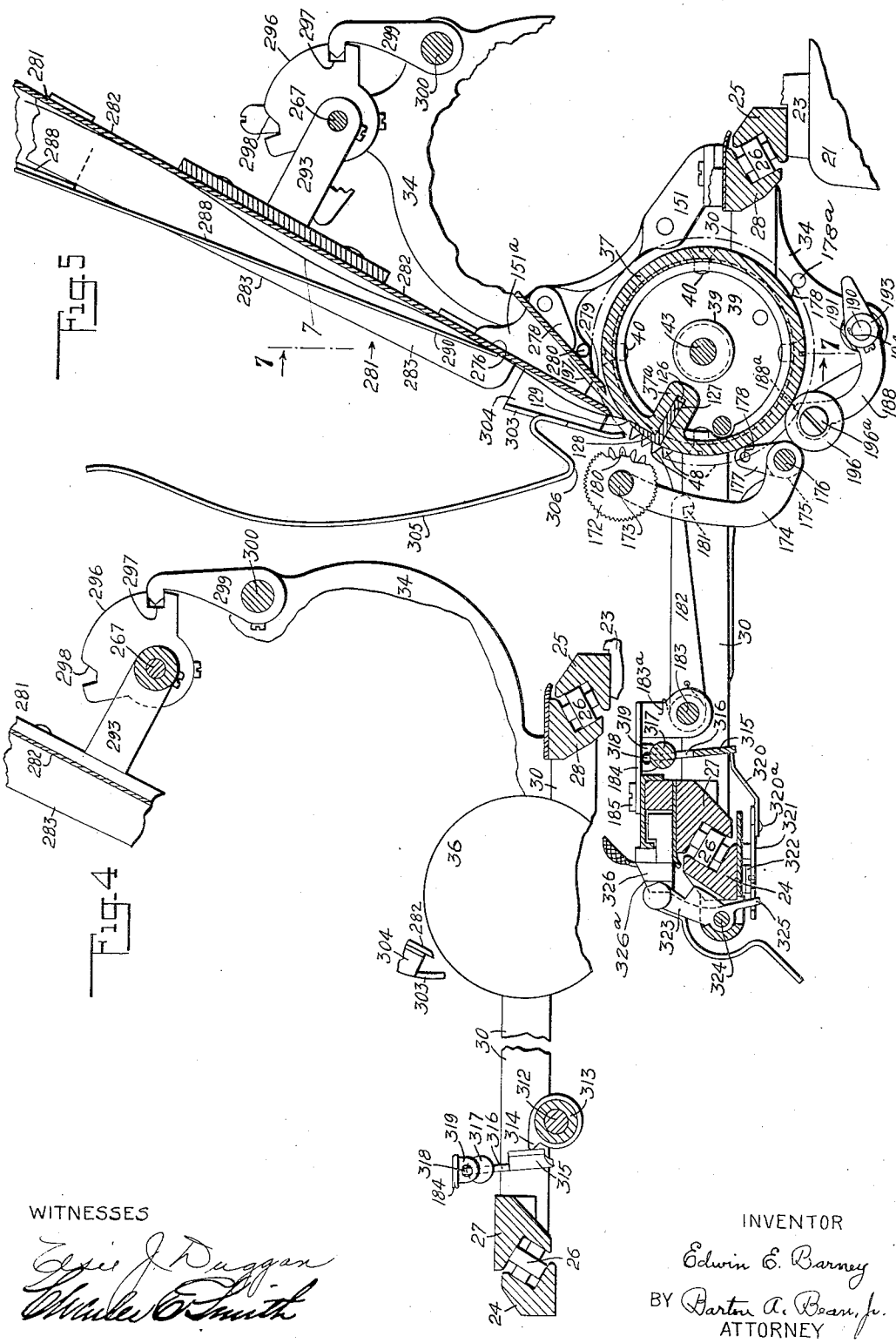
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TYPEWRITING MACHINE

Original Filed April 13, 1927 5 Sheets-Sheet 4



WITNESSES

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TYPEWRITING MACHINE

Original Filed April 13, 1927 5 Sheets-Sheet 5

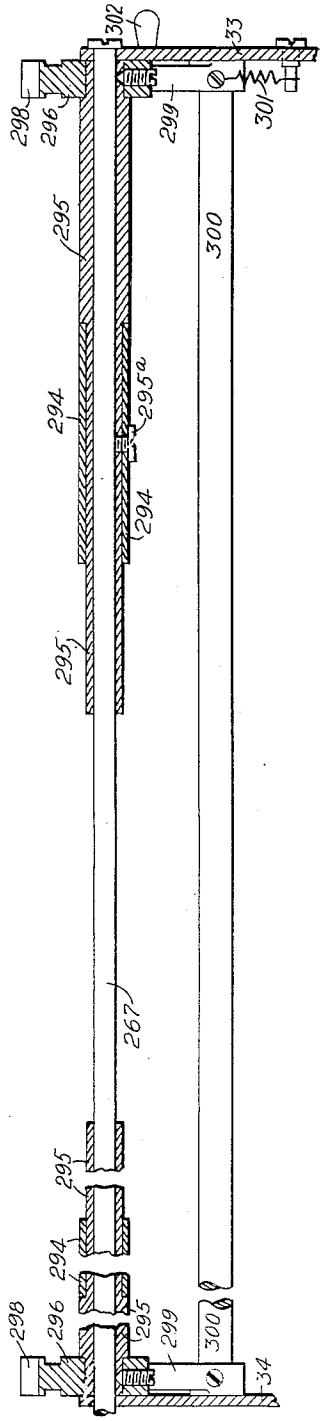


Fig. 6

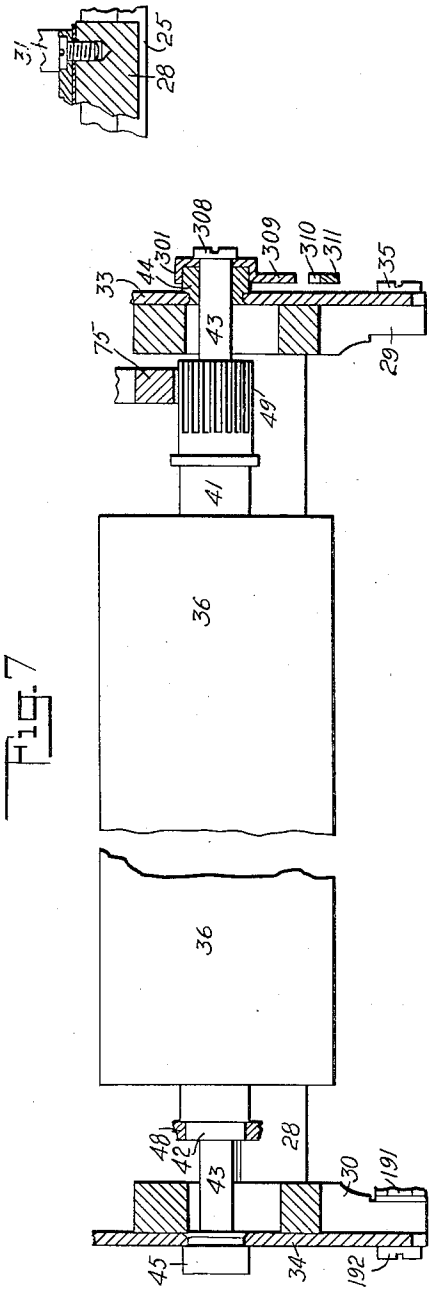


Fig. 7

WITNESSES

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Patented Aug. 22, 1933 1,923,771

UNITED STATES PATENT OFFICE

1,923,771

TYPEWRITING MACHINE

Edwin E. Barney, New Rochelle, N. Y., assignor to Remington Typewriter Company, Ilion, N. Y., a Corporation of New York

Original application April 13, 1927, Serial No. 183,466, now Patent No. 1,870,086. Divided and this application July 17, 1928. Serial No. 293,435

37 Claims. (Cl. 197—130)

My invention relates to multiple-billing mechanism for typewriting machines, and has for its general object the provision of a new and improved machine for handling multiform billing sheets of the character disclosed in the patent to E. Z. Lewis, No. 932,713, dated August 31, 1909, which sheets, interleaved with a reproducing medium, are wound on the platen of the machine, one complete wind or wrap being allotted to each separate form on the sheet, so that the number of forms to be printed at a single operation corresponds with the number of times the sheet is wound or wrapped on the platen. The carrying out of my invention in practicable form has resulted in various detail improvements relating to the feed and control of the multiform work sheet or form sheet itself, the supplying, feeding and control of the reproducing medium or carbon sheet, and various safety devices for insuring the proper cooperation of inter-related parts, all as will hereinafter appear.

This application is a division of my application Serial No. 183,466, filed April 13, 1927 and is directed more particularly to:

(1) Means for locking the platen controlling means against actuation except when the carriage properly registers with the magazine from which the work sheets are supplied.

(2) Means for affording various adjustments of the magazine.

(3) Means for preventing a continuous rotation of the platen except when it is in the desired rotative position to begin a line of writing.

(4) Means for controlling a work sheet as it is fed to and from the platen.

(5) Means for folding a work sheet as it is delivered from the platen, and to other details of the construction which will hereinafter appear.

To the above ends my present invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter described and particularly pointed out in the appended claims.

The principle of my invention will be found adapted to various styles of writing machines, but the preferred form of the invention, as illustrated in the accompanying drawings, has been applied to a #20 Remington typewriting machine.

In the drawings:

Fig. 1 is a front elevation on a reduced scale of a Remington typewriting machine embodying my invention, the upper part of the frame or supporting stand on which the machine is mounted also being shown.

Fig. 2 is a full-sized, fragmentary, side elevation of the carriage of the machine with devices of my invention applied thereto.

Fig. 3 is a fragmentary, vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a vertical, fore and aft sectional view taken on the line 4—4 of Fig. 1 but drawn on a larger scale and with parts omitted.

Fig. 5 is a like view taken on the line 5—5 of Fig. 1.

Fig. 6 is a detail transverse, vertical sectional view, with parts omitted; the section being taken on the line 6—6 of Fig. 2.

Fig. 7 is a detail, vertical, transverse sectional view showing the platen and the manner of mounting the same; the section being taken on the line 7—7 of Fig. 5.

Fig. 8 is a fragmentary, detail perspective view of the magazine and some of the associated parts.

Fig. 9 is a detail fragmentary side elevation of a portion of the structure with parts in section.

At all of the section lines arrows indicate the direction in which the view is taken.

Only so much of the machine is shown in the various views as is necessary to illustrate the features of the present invention in their embodiment therein.

Referring first generally to the embodiment of the invention herein disclosed, there is mounted on standards projecting upward from the stand on which the machine is supported, a magazine or box adapted to contain a supply of multiple-form sheets or work sheets.

In the present instance each one of these separate sheets contains six printed forms or blanks, the sheets being folded transversely between each two of the forms. The forms are adapted to be withdrawn from the magazine by hand, one by one, and introduced into the machine over a table or guide plate to a platen-carried clamp which at this time is at the front side of the platen, so that they may be front-fed thereover.

Normally lying between the open clamp and the face of the platen is the free end of a reproducing sheet or carbon strip which is supplied from a carbon carrying roll which is connected by gearing to special platen turning mechanism operative by a handle. Said handle is connected by gearing to the platen and is

effective when actuated to close the clamp, thereby clamping the bottom edge of the bill sheet and through it the carbon paper to the platen and thereafter to turn the platen continuously in backward direction through a plurality of complete revolutions, thus winding thereon the bill sheet and the carbon sheet in interleaved relationship so that the type imprints will be reproduced on all of the bill forms at a single printing operation.

As soon as the bill is completely wound in place, paper feeding devices are thrown into cooperative relationship with the platen in order to feed the bill from line-to-line and also to promote the proper ejection of the bill when the platen receives a continuous forward bill ejecting movement, these feeding devices being ineffective during the winding on of the bill which is brought about entirely through the holding action of the clamp on the platen.

On completing one line of writing, the platen may be line-spaced so as to advance the writing to the next line and so on until the forms are completely written. Thereafter the handle is actuated to continuously rotate the platen forward and eject the multiform bill sheet, the carbon at the same time being rewound on its holder. The operation above outlined is repeated for each multiple bill sheet.

It has been found in practice that the chief problem in controlling multiple bill sheets of the type herein used, together with a reproducing sheet, arises from the difficulty of obtaining accurate introduction, and an accurate smooth and uninterrupted feeding, and retraction of the sheets. I have provided various means for insuring such feeding and retraction, and for assuring a proper functioning of the machine generally.

The present invention is directed to some of these features which may be briefly referred to at this point as follows: Means are provided for preventing the actuation of the bill mechanism mounted on the carriage of the typewriting machine unless it is in exact register or proper relationship with the magazine or supply holder which is mounted on the stand or stationary frame.

Means are provided for preventing the operation of the multiple bill mechanism unless a work sheet is clamped in place for winding on.

Means are provided for accurately and effectively directing the work sheets to and from the platen and for delivering the printed work sheets in a folded condition as they are ejected from the platen.

Means are provided for affording an adjustment of the magazine in various directions to enable it to properly register with the work sheet receiving means on the carriage under varying conditions of use.

Means are provided whereby the work sheet guiding means on the carriage may be readily shifted to and latched in an ineffective position to afford ready access to various underlying parts.

All of these means and devices together with others not referred to cooperate to insure the proper operation of the mechanism and to produce a smooth accurate control of the bill and carbon sheets with a minimum of effort and also with the practical elimination of the danger of "spiraling" or inaccurate feeding, which is fatal in this style of work. Other features of the construction will be referred to in the following detailed description.

As shown in Fig. 1 the magazine or holder 1 which is preferably made of sheet metal, is provided with cut-outs, and is in what may be termed skeleton form for the sake of lightness. The magazine has a top cover 2 hinged at 3 at the rear and has a front wall consisting of two plates 4 between which is left a vertical central opening through which the operator may grasp the forms one at a time and withdraw them from the top of the magazine, the loosely hinged cover yielding or being lifted for the purpose. The upright side portions 5 of the magazine are formed with vertical guide slots 5^a which receive the end portions of a metal bar 6 which serves as a weight to rest on the pile or stack of folded multiple bill forms 7 within the magazine. It will be understood that the rod may yield or move upward in its guide slots whenever a bill sheet 7 is withdrawn from the magazine. Knobs 8, secured to the projecting end portions of the rod 6, prevent its accidental endwise withdrawal.

The bottom of the magazine has secured to it near its ends a pair of clamping blocks 9 (see Fig. 8) which are secured by screws 10 to a cross bar 11. This provides for a bodily tilting adjustment of the magazine as well as an adjustment of it along the supporting rod 11. Said rod 11 is mounted in clamping blocks 12 held in their position of vertical adjustment by clamping screws 13 to a pair of uprights or standards 14 that rise from the rear portion of a frame or stand 15 (Fig. 1) on which the typewriting machine is supported. This stand may be of ordinary construction but the uprights 14 have been added thereto to provide a support for the magazine.

It will be observed that the mounting is such that the magazine is adjustable sidewise, may be given a tilting adjustment around the bar 11, and receive a bodily up-and-down adjustment on the uprights 14. The frame or stand 15 is provided with cross rods of which the forward one 16 is shown in Fig. 1, said cross rod being provided with sockets 17 to receive the feet 18 of the typewriting machine.

The main frame of said machine comprises a base portion 19 from which rise corner posts 20 supporting a top plate 21. Rising from the top plate, as shown in Figs. 1, 2 and 5, are front and rear lugs 22 and 23 respectively to which are screwed stationary guide rails or track ways 24 and 25 respectively. These track ways are oppositely grooved and receive antifriction rollers 26 which also cooperate with the front and rear cross bars 27 and 28 respectively of a carriage truck which further comprises right and left-hand side bars numbered respectively 29 and 30.

A bracket arm 31 (Fig. 2) secured to the top of the truck at its right-hand rear corner is connected by a band or strap with the usual carriage motor or spring drum 32 whereby the traveling carriage, comprising the truck 27-30 together with the various parts mounted thereon, is constantly urged leftward along the trackways 24 and 25. The parts of the typewriting machine thus far described are common to the #20 Remington typewriter.

In carrying out my invention I provide a new style or construction of platen carried paper clamp; also a new style of paper table or support; a carbon roll holder; work sheet ejecting means and other devices, and parts for controlling these elements, all mounted on the truck or carriage, although certain only of these features are claimed herein. To provide mount-

ings for these parts, supplementary end plates are mounted on the carriage truck. The right and left-hand end plates numbered respectively 33 and 34 are secured respectively to the outer face of the end bars 29 and 30 by means of screws and dowel pins 35 (Figs. 1, 2 and 3). The platen, indicated as a whole by the reference numeral 36, is in the form of a hollow shell or tube preferably made of aluminum. Said platen, as best shown in Figs. 3 and 5, comprises a tubular body portion 37 to which are secured heads or end pieces, the right-hand head being numbered 38 and the left-hand head 39. These heads are reduced at their inner ends to fit inside the tube 37 and are secured in place by screws 40. The heads 38 and 39 are provided respectively with outwardly extending hub portions 41 and 42 which are bored out to receive a platen shaft or axle 43, the hub 42 being secured to said shaft by a screw 42a. At its right-hand end portion, the axle bears in an enlargement or hub 44 which is fixed in the end plate 33. The left-hand end portion of the axle 43 bears in an enlargement or hub 45 secured in the end plate 34. The portion of the axle projecting leftward beyond the bearing 45 carries a finger wheel 46 of ordinary construction for turning the platen by hand, which wheel is secured in place by set screws 47. The outer end portion of the hub 42 is reduced in diameter and has suitably secured to it a gear wheel 48 for positively connecting the platen with paper feeding devices hereinafter described. The hub portion 41, of the right-hand platen head, is extended outward and formed with teeth 49 to provide a pinion that intermeshes with platen driving mechanism hereinafter described.

Driven or forced on the pinion so as to have a tight fit therewith is a flanged hub or bearing element 50 (Fig. 3) to which is fixed a line spacing ratchet wheel 51, the wheel 51 and the part 50 being secured together and acting as a unitary member, which in turn is fast on the hub 41, 49 and consequently rigid with the platen 36. The flanged portion 52 of the ratchet wheel member 50, 51 provides a bearing for the hub portion 53 of a pawl carrier 54, the parts 53 and 54 constituting the pawl carrying member being united and adapted to turn freely on the flange 52. At its lower end the pawl carrier 54 carries an outwardly projecting pin 55 over which is hooked a spring 56, which at its rear end is anchored to a suitable bracket. This spring assists in restoring the line space train to normal position after operation.

The pawl carrier 53, 54 has pivoted to its upward extension a line spacing pawl of ordinary construction, which is adapted to coact with the ratchet wheel 51. Said pawl is connected by suitable means to a hand controlled actuating lever 63 (Fig. 1) by which the line spacing pawl may be actuated in the usual manner as in left-hand line spacing devices employed in Remington machines and as fully disclosed in my hereinbefore mentioned application Serial No. 183,466.

Cooperating with the ratchet wheel 51 is a roll detent 72 (Fig. 3) which is mounted at the forward end of a spring arm 73 that extends rearward and is secured by a screw to a projection that is integral with the bracket 31. The spring mounted roll-detent when effective cooperates in the usual manner with the line space ratchet wheel.

In addition to the mechanism just described for turning the platen through line space distances, means are provided for turning the platen continuously through a plurality of revolutions, said means comprising speed-multiplying mechanism, next to be described. Intermeshing with the pinion 49 is a driving gear wheel of comparatively large diameter, which is illustrated in Fig. 3, and which is of ordinary construction, comprising a rim provided with spur gear teeth 75, radial spokes 76 and a hub portion 77. Said hub extends outward and bears at its outer end against a circumferential enlargement on a supporting sleeve or hub 78 which is riveted or otherwise fixed to the end plate 33. The supporting sleeve 78 bored to receive and provide a bearing for the shaft 86. For the purpose of actuating the stub shaft 86 a crank member or handle is provided comprising a crank arm 99, a hub 100, and a handle proper or finger piece 101. The hub is fitted over the projecting portion of the shaft 86, outside the end plate 33, and is secured to the shaft by a cross pin 102.

At this point it may be well to explain that there are provided intermediate actuating connections between the shaft 86 and the gear wheel 75—77 involving a lost motion connection that enables said shaft and its crank 99—101 to be given a limited preliminary movement independently of said gear wheel and the platen which is controlled thereby. It may also be explained that there are adjustable stop means for arresting the rotation of the gear wheel 75—77 in opposite directions, all as disclosed in my hereinbefore mentioned application of which this case is a division and in which prior application the features referred to are claimed. Inasmuch as a specific detailed description of these features are unnecessary to an understanding of the present invention such description will be omitted and it will be sufficient to understand that rotative motion is transmitted from the crank 99—101 to the gear 75—77 and from the latter through the pinion 49 to the platen and that such motion in both directions is limited.

Preferably, the driver or gear wheel 75—77 is provided with a circular shaped guard or cover plate 123 which is made of sheet metal and is provided with a flange to overlie the periphery of the wheel. The cover plate is provided with enlargements or bosses 124 (Fig. 1) which receive headed screws 125 whereby the cover-plate is secured to the side-plate 33 of the carriage frame. The cover-plate is disposed inside the plate 33 and spaced leftward therefrom by the bosses 124 so that said cover-plate is brought into the vertical plane of the gear wheel which it covers.

Referring now briefly to the automatic paper clamp which is mounted on the platen, and having reference to Fig. 5, the tubular platen body 37 is cast with an inwardly projecting rib-like part or enlargement 37a in which is cut a slot-way 126 which extends longitudinally of the platen and receives the bar-like or body portion 127 of the clamp which is adapted to slide radially in and out of the slot-way 126. Said clamp further comprises a clamping flange or lip 128 which is formed integrally with the body or bar 127 and projects rearward at right angles from said body outside the platen surface, to which the outer face of the lip is curved to conform. The inside or working face of the lip 128 is straight or flat and fits against

the corresponding flat surface of an under-cut or depression 129 in the tube 37. The construction is such that when the clamp is closed it hugs the platen tightly and provides an uninterrupted surface, as will be clearly apparent from Fig. 5. Of course, when the paper is inserted between the coacting flat clamping face 129 and the under face of the lip 128, the clamp will be projected outward slightly away from the platen surface, but not sufficiently to alter materially the regular continuity of the surface and the smoothness of the rotation of the platen will not be affected.

Means, not shown herein but fully disclosed in my hereinbefore mentioned parent application where such means are claimed, are employed for automatically opening and closing said clamp. However, since a specific disclosure of these means are unnecessary for a clear understanding of the features of the present case, such means will not be referred to in detail except to point out that the clamp is automatically controlled, so that it is opened to receive the work-sheet at the end of the rearward work-sheet ejecting movement of the handle 101, and thereafter is automatically snapped shut by the preliminary forward actuation of the handle 101, so as to clamp the paper to the platen before the winding-on operation starts.

It will be apparent that during the winding-on of the bill sheet, it will be positively connected to the platen and caused to be wrapped around the same primarily through the paper clamp 127, 128. After the bill has been written, however, and it is desired to eject it rapidly, the clamp is of no assistance, and accordingly there have been provided feeding devices which are thrown into effective position and positively connected to the platen automatically when the platen approaches the end of the winding-on operation, so that the feeding devices may cooperate with the bill to advance it during line spacing operations and also during the subsequent continuous ejecting operation.

As shown in Figs. 1, 2, 3 and 5, the paper feeding devices comprise knurled metal rolls 172 fixedly secured one near each end of a shaft 173 which extends longitudinally of the platen above the printing line, the rolls being so disposed as to cooperate with the face of the platen near its ends. The shaft 173 is mounted near its ends on a pair of downward curving arms 174 which at their lower ends are provided with outwardly extending collars 175 which fit over and are fixedly secured to a rock shaft 176 which bears at its ends in the plates 33 and 34 of the carriage frame. Crank arms 177 upstanding from the collars 175 are formed with holes through which are hooked the forward ends of draw springs 178. The rear end of the left hand spring is anchored to a pin 178[a] (see Fig. 5) projecting inward from the side plate 34, while the rear end of the right end of the right-hand spring 178 is anchored to an arm 58[a] integral with a bracket secured to the carriage, as shown in Fig. 2. The springs tend constantly to swing the shaft 176 in a direction which will press the feed rolls 172 into engagement with the surface of the platen. Mounted on the left-hand end of the shaft 173, outside the arm 174, is a pinion 180 (Fig. 5) which lies in the same fore-and-aft plane as the gear 48 and is adapted to intermesh therewith when the feed rolls 172 engage with the surface of the platen or the paper thereon. The construction is such that the feed roll shaft 173 is positively connected with the platen through the gear 48 and pinion 180, so that when the platen is turned, it will positively turn the feed or pressure rolls 172, causing them to coact to feed or advance the paper passing between them.

In order to lock the feed rolls 172 out of operation during the winding-on of the bill when they would be superfluous, means are provided comprising lugs 181 extending outward from the arms 174 and adapted to be engaged by hooks or arms 182 which extend rearward from and are secured to a rock shaft 183 that bears in angular brackets 184 secured by screws 185 to the front part of the carriage. A spring 183[a] coiled around the rock shaft and acting thereon, tends constantly to press the hooks or arms 182 downward.

The operation of the means for automatically controlling the paper feeding mechanism is as follows:—When the clamp 127, 128 is open to receive the work sheet it will act against the feed rolls 172 to force them away from the surface of the platen and cause the hooks 182 to snap down over the lugs 181 which will operate to maintain the feed rolls in inoperative position during the subsequent winding-on of the bill. As the end of this winding-on approaches means which it is unnecessary to disclose herein are employed for automatically releasing the feed roller from control of the locking arms 182. The parts are so timed that this operation takes place approximately at the end of the winding-on operation.

One of what may be called the "safety" devices incorporated in the machine, and which forms part of the present invention, comprises means for preventing the billing mechanism from being operated in a direction to wind on a bill sheet unless such bill sheet has been actually clamped in place on the platen. The means aforesaid comprise, as shown in Figs. 2, 3, and 5, an arm 188 provided with a hub 189 which fits over and bears on a rod or shaft 190, said shaft being secured in a tubular support or nut-like member 191 which cooperates with a screw 192 to maintain the parts in fixed relationship with the end plate 34. The rod projects inward from the end plate and underlies the platen near its left-hand end. A collar 193 is secured to the right-hand end of the rod 190 and has anchored to it a wire spring 194 which is coiled around the rod and is connected to the arm 188, tending constantly to draw the forward end of said arm upward. Said forward end terminates in a tooth or pawl 188[a] which registers with a depression 195 (Fig. 2) formed in the left-hand end portion of the platen surface. The outer or free end of the arm 188 carries a pin 196[a] on which is rotatably mounted a roller 196 which is adapted to ride on the surface of the platen, it being constantly pressed there-against by the spring 194. The roller 196 is also adapted to engage with the depression 195, and the construction is such that if there is no paper in the machine, the roller riding down in the depression 195 will permit the pawl or detent tooth 188[a] to engage with the edge of said depression after the platen has been only slightly turned in winding-on direction, such engagement positively arresting the platen and preventing operation of the mechanism. It will be further understood that when a bill sheet has been clamped to the platen, it will bridge or cover

over the depression 195 therein so that the roller 196 will not drop into said depression. Thus the pawl will be held out of engagement with said depression when the platen is turned, and will be ineffective to lock the mechanism against operation.

As has been hereinbefore pointed out a sheet of reproducing material or carbon paper 197, ordinarily supplied in roll form is automatically interwound with the bill sheet as the latter is wound on the platen, and is automatically wound off the platen and back on the carbon roll carrier as the completely written bill sheet is wound off the platen and ejected therefrom in folded form. The mechanism including the carbon roll carrier and the means by which it is operatively connected with and controlled from the platen for the purpose stated above is claimed in a separate divisional application filed June 16th, 1928, Serial No. 285,384. Such mechanism is unnecessary for the purpose of arriving at an understanding of the present invention and has not been shown in detail in the accompanying drawings, nor is any detail description of it herein deemed necessary.

The forward end portions of the bracket arms 151 (see Fig. 5) are twisted vertically and terminate in head-like portions 151ª and there are ears 278 bent down from the end portions of a guide plate 279 which rests on pins 280 projecting inward from the heads 151ª. The guide plate 279 serves to receive and support the free end portion of the carbon paper 197 as it passes downward and forward from between the roll holder and the feed roll not shown. The parts are so adjusted that when the carbon rewinds on the roll holder during the operation of the machine, the end portion of the carbon is left so that it will lie in position to fall into or just back of the space between the clamp 128 and the coacting surface 129 when the clamp is opened to receive the work sheet. This will be best understood from a consideration of Fig. 5.

The work sheet 7 having been, as heretofore stated, withdrawn at its feeding-in end portion from the magazine 1 is led down to the platen over paper guiding devices which constitute in effect a chute and comprise an inclined sheet metal plate or table designated as a whole by the numeral 281. The body portion or plate 282 of the table is of a width to accommodate the sheets commonly employed in practice. Mounted on the upper face of the body or plate proper 282 are side guides or plates 283 of which the right-hand one has lugs 284 projecting downward through cross slots 285 which hold the right-hand guide 283 in proper vertical position. Said guide is provided with horizontal extensions 286 which receive clamping screws 287 that are adapted to slots in the plate 282 and afford adjustments of the right-hand plate 283 towards and away from the left-hand guide plate 283, so as to provide the correct width for the passage of the work sheet as it is guided downward. Said sheet in its downward course passes between the upper face of the plate 282 and guide members designated as a whole each by the numeral 288, said guide members being formed of sheet metal and being divided by vertical parallel cuts 289 into fingers 290 which at their lower ends are adapted to engage loosely in cross depressions 291. The finger portions 290 are shown as riveted to the body portions, but it will be understood that if desired the parts 288 may be unitary. Secured to the upper curved portions of the bodies 288 and extending over and down behind the same are supplementary fingers 292 which press lightly against the face of the plate 282. The whole construction is designed to guide the down-coming work sheet or form lightly and evenly over the table 281. So guided the lower end portion of the sheet will be brought into position to be engaged by the clamp 127, 128 when it is opened to receive an end of the sheet. The table member 281 rests normally at its lower end on the inclined faces 276 of the brackets 151, 151ª. The paper table as a whole is pivotally supported on a cross rod or shaft 267 and to this end is provided at its rear side with bearing blocks or projections 293 which terminate in outwardly extending hubs 294 (see Fig. 6) which fit over said rod and over end pieces 295 which prevent lateral displacement of the paper table on its pivotal support. The end pieces 295 and hubs 294 are held rigidly united to turn on the shaft 267 by screws 295ª. Said table is normally held in operative position by means of detent members 296 rigid with said end pieces and formed with notches 297 and 298 to accommodate detents 299 mounted at the ends of a rock shaft 300 pivoted in the end plates 33 and 34. Normally the detents 299 engage with the notches 297, holding the table in operative position. A coiled spring 301 (Fig. 2) holds the detents in engaging position. The right-hand detent 299 is provided with a finger piece 302 whereby the detents may be withdrawn from the notches 297, permitting the paper table to be thrown back about its pivotal axis, the detent notches 298 engaging with the detents to hold the paper table in its thrown-off position, thus exposing the underlying mechanism. The rear sides of the notches 298 are so shaped that the paper table may be pulled forward to restore it to normal position without requiring any manipulation of the detents 299 through the controlling finger piece 302.

The paper table 281 also provides guiding devices for receiving the work sheet 7 after it has been written and as it is fed off the platen during the continuous ejecting movement thereof. Said devices comprise the curved upper end portions 288ª of the members 288 which act to receive the top edge of the sheet as it is fed upward. The upwardly advancing edge of the sheet is guided to these curved portions 288ª by guide plates 303 secured to the lower side edges of the plate 282 and extending inward therefrom, said plates 303 being off-set forward to provide a receiving opening indicated in Fig. 5 by the numeral 304. Integral with the guide plates 303 are upwardly extending fingers 305 which are so shaped as when the upwardly advancing paper is received by the curved guides 288ª and thence directed downward, it will be caught by these fingers 305 and directed downward to the root portions 306 thereof and thence again directed upward. It will be recalled that the work forms 7 are creased or folded crosswise between blanks. The receiving and guiding devices, comprising the parts 288ª, 305 and 306 are so disposed and shaped that they will automatically fold the feeding-out work-sheet along these creases so that when it is released from the platen and discharged, it will lie within the receiving guides and between the parts 288ª and 305 resting on the fingers 290 in folded condition, enabling it to be conveniently removed through the space between the lower edges of

the curved parts 288[a] and the upper ends of the fingers 305.

Finally, safety devices have been provided in accordance with my present invention which will lock the mechanism against operation unless the carriage has been moved to the limit of its right-hand travel, in which position it will be in accurate register with the stationary magazine 1. This is an important feature, since if it were possible to operate the winding-on mechanism when it was not in exact register with the paper as it was brought down from the magazine, there would be an inevitable tendency to feed crookedly, resulting in the irregular winding-on that is commonly referred to as "spiraling". The safety devices referred to are shown clearly in Figs. 1, 2, 3, 4 and 5. These comprise a cap 307 which fits loosely over the outwardly projecting boss 44 and is secured to and in fixed relationship with the outer end portion of the platen axle or shaft 43 by a shoulder screw 308. The shouldered portion of this screw is square or hexagonal and fits in a corresponding hole in the cap, so that the cap is forced to rotate with the shaft 43. The cap is formed with an integral radial extension, arm of finger portion 309 which is adapted to coact with a notch 310 formed in the upper rear end portion of an arm 311 which extends forward outside the end plate 33 and is secured to the outwardly extending end portion of a short rock shaft 312 which extends inward through the end bar 29 and bears rotatably therein.

Fixed to the inner end of said rock shaft inside the end bar is a hub 313 (see Fig. 4) having a projecting nose 314 which is adapted to be engaged by the right-hand end portion of a pivoted plate 315. Said plate is provided with upward extensions 316 which are secured in the stiffening rod 317, the rod and plate being disposed behind and longitudinally of the front bar 27 of the carriage. The extensions 316 are provided with outwardly extending lugs 318 which bear in perforated ears 319 depending from the angular brackets 184. The plate 315 is adapted to be actuated by a finger or extension 320 which is secured by rivets 320[a] to a pivot arm 321, which is part of the regular line locking train of a #20 Remington typewriting machine and is adapted to be turned pivotally under certain conditions.

The margin stops 322 are of the usual construction and need not be described in detail. The stationary stop 323 has a pivot 324 and is provided with a downwardly extending finger 325 which operatively engages with the pivoted member 321. The stop 323 is connected through the fingers 325 with the member 321 in such a way that when the stop is turned on its pivot 324, the member 321 will be turned on its pivot. In the present case the stop 323 is thus turned automatically during the rightward movement of the carriage. For this purpose the usual carriage-carrier margin stop 326, which is adjustable along the front bar of the carriage in a manner well understood, is provided with a special incline or cam face 326[a] (Fig. 5) which is adapted to coact with the upper arm of the frame stop 323. The adjustable carriage stop 326 during the rightward movement of the carriage will engage at its cam or beveled face 326[a] with the stop 323 and exerting a cam action thereon will swing its upper end portion forward, the finger 325 being moved rearward and acting on the member 321 which will cause the extension 320 to swing the plate 315 rearward on its pivots 318. As the plate is swung rearward its right-hand end portion acting against the nose 314 will rock the shaft 312 and swing the arm 311 downward so that the notch 310 therein will disengage from the arm or finger 309, thus releasing the platen shaft 43 so the platen may be turned. It will be understood that at all times other than when the stops 323 and 326 are operatively engaged at the end of the right-ward movement of the carriage, the locking arm 311 will be maintained up in operative position. This is due to a constantly acting flat spring 327 which underlies the end bar 29 and is secured thereto by screws 328. Said spring has an outwardly extending end portion 329 which underlies the arm 311 and tends constantly to swing it upward. It is only when this spring is overcome by the coacting carriage stops 323 and 326 in the manner described that the locking arm 311 is swung down to its non-working position.

The various features of the operation of the present invention have been explained and discussed in connection with the description of some of the different mechanisms which coact therewith, and it is thought therefore that a further detailed lengthy description of the mode of operation is unnecessary. It will be understood that in making use of the multiple-billing mechanism constituting the invention the operator first pushes the carriage to the extreme right-hand position causing the stops 323 and 326 to coact to arrest the carriage, said stops also effecting a downward throw of the locking arm 311, thus freeing the finger 309 so that the platen may be rotated. As a result the paper guiding devices on the carriage or traveling paper carrying device are registered with or in line with the magazine, stationary supply device or source of supply 1, so that the top bill sheet 7 in the pile of folded sheets in the magazine or source of supply may be brought down from said magazine as heretofore explained and introduced through the chute, that is, over the paper table 281, passing under the guide fingers 290, and being brought into position with the lower or bottom edge of the multiple-bill sheet 7 in position to be gripped by the platen clamp. As has been explained, the free end of the carbon 197 overlying the guide plate 279 behind the table 281 will have its free end in line with the free end of the bill sheet and behind the same. The clamp 127, 128 will then be opened through the cooperation of the parts, as has been explained. Assuming that the clamp 127, 128 is open and in the position shown in Fig. 5, the free ends of the bill and carbon sheets may be introduced between the clamp and the platen face, and then the handle is pulled forward, giving a continuous rotation to the platen sufficient to rotate it in the present instance through approximately six revolutions so as to wind six plies of the paper with the interleaved carbon around the platen. During this continuous rotation the paper feeding rolls 172 will be out of operation, and will be restored to operative position only at the end of the platen rotating movement. The platen when arrested will present the outer bill sheet in position to have the first line thereon written. As is well understood the writing will take place through the actuation of the usual printing instrumentalities and ribbon mechanism of the standard Remington machine not herein disclosed but of

regular construction. As the first line is written the carriage will, with the parts mounted thereon, space leftward step-by-step under the control of the usual escapement devices not herein shown, and when the end of the line is reached, the carriage will be restored from left to right and the platen line spaced, by actuation of the line space lever 68. The second and subsequent lines are thereafter written, the platen being line spaced in between, all as heretofore explained. It will be understood that each character written on the outer ply of the sheet through the ribbon will be duplicated on each of the five underlying bill forms or blanks through the carbon paper or transfer material 197. The writing of the bill having been completed, the carriage will be restored from left to right and the handle 101, when actuated, will turn the platen forward continuously to eject the bill. This ejection will be assisted by the pressure rolls 172. At the same time that the platen is operating to eject the bill, the carbon roll holder will be turned to rewind the carbon paper thereon. As the bill sheet is retracted, it will be received in the receiving guide or paper holder comprising the parts 288[a] and 305 in folded form. As has been described the platen clamp opens automatically to release the written bill sheet which may then be removed, the outward releasing action of the clamp also operating to throw off the pressure rolls 172 and lock them in inoperative position.

The operation above outlined may be repeated with each bill sheet. It will be understood that in writing a bill, the tabulating mechanism and other devices associated with the Remington typewriting machine may be employed at convenience.

Changes of construction may be made without departing from my invention as it is defined in the accompanying claims, and various features of it may be separately employed.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a mechanism of the character described, the combination of a stand, a writing machine mounted thereon and provided with a traveling carriage, a magazine containing a supply of work sheets, said magazine being mounted on said stand in a stationary position, a work sheet guide on said carriage, a platen on said carriage, means for rotating said platen to feed a work sheet thereover to bring it into position to receive typewriting, and means for preventing the operation of said platen-rotating means except when the said guide on the carriage is in register with the magazine.

2. In a mechanism of the character described, the combination of a stand, a writing machine mounted thereon and provided with a traveling carriage, a magazine containing a supply of work sheets, said magazine being mounted on said stand in a stationary position and the carriage moving into and out of widthwise register with work sheets carried thereby, means on said carriage for feeding a work sheet after it has been withdrawn from said magazine, and means for preventing the operation of said feeding means except when the carriage is in register with the work sheets in the magazine.

3. The combination of a traveling paper-receiving device, means carried thereby for feeding paper over said device, and automatically operating locking means for preventing the operation of said paper feeding means except when said traveling device is at a single point in its travel.

4. The combination of a traveling paper-receiving device, means carried thereby for feeding paper over said device, and locking means for preventing the operation of said paper feeding means except when said traveling device is at one extreme of its traveling movement.

5. The combination of a traveling carriage, hand actuated paper feeding means on said carriage operable independently of the travel thereof, relatively adjustable stops for limiting movement of said carriage in one direction, and automatically operating locking means for preventing operation of said paper feeding means except when said stops are in contactual engagement.

6. The combination of a traveling carriage, paper feeding means on said carriage operable independently of the travel thereof, relatively adjustable stops for limiting movement of said carriage in one direction, normally effective locking means for preventing operation of said paper feeding means, and an operative connection between said locking means and one of said stops for automatically releasing said locking means.

7. The combination of a traveling carriage; paper feeding means on said carriage; relatively adjustable stops for limiting movement of said carriage in one direction; means for preventing operation of said paper feeding means; and an operative connection between said last recited means and one of said stops, said connection comprising a member having a stationary pivot, a pivoted plate operative by said member, and a rock shaft provided with a nose actuated by said plate.

8. The combination of a traveling carriage, paper feeding means on said carriage, stops for limiting movement of said carriage in one direction, and means for preventing operation of said paper feeding means except when said stops are in contactive engagement, said preventive means comprising a rotary arm and a pivoted spring-pressed arm having a locking notch cooperative with said rotary arm.

9. The combination of a traveling carriage, paper feeding means on said carriage, stops for limiting movement of said carriage, means for preventing operation of said paper feeding means, and means for releasing said preventive means, said releasing means being operative through the coaction of said stops.

10. The combination of a traveling carriage, paper feeding means on said carriage, stops for limiting movement of said carriage, means for locking said paper feeding means, and means for releasing said locking means, said releasing means comprising an arm movable by one of said stops when engaged by the other, a plate actuated by said arm, a rock shaft, and a nose on said rock shaft actuated by said plate.

11. The combination of a traveling carriage; paper feeding means on said carriage; stops for arresting the carriage; means for preventing operation of said paper feeding means, said preventive means comprising a rotary finger, a spring pressed locking arm notched to cooperate with said finger, and a rock shaft on which said locking arm is mounted; and means for releasing said preventive means, said releasing means being operative by the coaction of said stops.

12. The combination of a traveling carriage; paper feeding means on said carriage; stops for arresting the carriage; means for preventing operation of said paper feeding means, said pre-

ventive means comprising a rotary finger, a spring pressed locking arm notched to cooperate with said finger, and a rock shaft on which said locking arm is mounted; and means for releasing said preventive means comprising a pivoted member operative by one of said stops when moved by the other, a pivoted plate actuated by said pivoted member, and an extension fixed to said rock shaft and actuated by said plate.

13. The combination of a traveling carriage, a platen thereon, means for rotating said platen to wind a work sheet around it, stops for limiting traveling movements of said carriage, a finger connected to rotate with said platen, locking devices comprising a notched arm tending constantly to engage said finger, and means operative through the coaction of said stops to release said notched arm and render it inoperative.

14. The combination of a platen mounted for longitudinal and rotary movement, means for rotating the platen to wind paper thereon, and means for preventing such rotation of the platen except when it is in a longitudinal position to begin a line of writing.

15. The combination of a platen, a traveling carriage on which said platen is mounted, continuous turning means for the platen, and means for preventing said turning means from operating, releasable when the carriage reaches the end of its travel in one direction.

16. The combination of a platen, a traveling carriage on which said platen is mounted, continuous turning means for the platen, means for preventing said turning means from operating, said preventive means being thrown out when the carriage reaches the end of its travel in one direction, and line spacing means for turning the platen step by step, said line spacing means being independent of said continuous turning means.

17. The combination of a platen provided with a depression in its surface, means for rotating the platen backward continuously to wind paper thereon, a roller adapted to enter said depression during the initial stage of backward rotation of the platen in the event that said depression is uncovered, and a stop pawl controlled by said roller and effective to arrest the platen and prevent backward rotation thereof.

18. The combination of a platen, means for rotating the platen backward continuously to wind paper thereon, and means for arresting the platen at the start of such backward rotation except when a work sheet is in place thereon.

19. The combination of a platen, means for rotating the platen backward continuously to wind paper thereon, and means for arresting the platen at the start of such backward rotation in the absence of paper winding on the platen, said means comrising a roller cooperative with a depression in the platen surface and a stop pawl engageable with the platen and holding it against backward rotation.

20. The combination of a carriage, a platen thereon, means for continuously rotating the platen to wind paper around it, a spring pressed arm pivoted to said carriage, a roller mounted on said arm, and a stop pawl also mounted on said arm, said roller and said stop pawl cooperating with irregularities in the surface of the platen when they are exposed to view.

21. The combination of a carriage, a cylindrical platen thereon, and guiding devices mounted on the carriage comprising a chute through which a work sheet is introduced to the platen in front thereof and also a receiving guide adapted to receive this same work sheet as it is led away from the platen, said chute and said receiving guide having a common pivotal support.

22. The combination of a carriage, a cylindrical platen thereon, a pivoted guiding element mounted on the carriage and comprising a chute through which a work sheet is introduced to the platen in front thereof and also a receiving guide adapted to receive this same work sheet as it is led away from the platen, and latching devices for positively locking said element comprising said chute and said receiving guide in both normal and abnormal positions.

23. The combination of a carriage, a cylindrical platen thereon, and guiding devices mounted on the carriage comprising a receiving paper guide for a work sheet provided with transverse folds, said receiving guide being formed with oppositely curving fingers adapted to automatically fold the sheet as it is delivered from the platen.

24. The combination of a stationary supply device for paper, a paper receiving device that travels transversely of said supply device into and out of alignment therewith, a paper feed device that travels with said receiving device, and automatically operating locking means that prevent an actuation of said paper feed device to cause paper to be fed from said supply device when the receiving device is out of alignment with said supply device and for freeing said device to permit an actuation thereof when the supply device and the receiving device are in alignment.

25. The combination of a carriage, a rotary platen carried thereby, and automatically operating platen locking means including means for freeing the platen from control of said lock when the carriage reaches a predetermined point in its travel.

26. The combination of a carriage, a rotary platen carried thereby, means for continuously rotating said platen more than a single revolution to wind a work sheet thereon, means for normally locking the platen against rotation by said platen rotating means, and means for automatically releasing said locking means when the carriage reaches a predetermined point in its travel.

27. The combination of a rotary platen, a paper clamp carried thereby, and automatically operating means for locking the platen against rotation in one direction from a position it assumes when the clamp is positioned to receive a work sheet and for releasing the platen from control of said locking means when the carriage reaches a predetermined point in its travel.

28. The combination of a carriage, a rotary platen carried thereby, platen locking means, and automatically operating controlling means therefor controlled by the travel of the carriage for rendering said platen locking means effective and for freeing the platen from control of said locking means to afford a rotation of the platen.

29. The combination of a carriage, a rotary platen carried thereby, platen locking means, and automatically operating controlling means actuated by the travel of the carriage and only when it has been returned to a position to begin a line of writing for releasing said locking means.

30. The combination of a carriage, a rotary

platen carried thereby, platen locking means, means by which said locking means are rendered ineffective when a work sheet is in the machine and is rendered effective when there is no work sheet in the machine, a second platen locking means, which are automatically controlled by the travel of the carriage.

31. The combination of a carriage, a rotary platen carried thereby, means by which said locking means are rendered ineffective when a work sheet is in the machine and is rendered effective when there is no work sheet in the machine, a second platen locking means which are automatically controlled by the travel of the carriage, said last mentioned locking means being released only when the carriage is returned to a position to begin a line of writing.

32. The combination of a platen, means for rotating the platen backward continuously to wind paper thereon, means for arresting the platen at the start of such backward rotation except when a work sheet is in place thereon, a carriage by which said platen is carried, locking means for locking the platen against rotation, and means controlled by the return of the carriage to the beginning of the line position for automatically releasing said locking means.

33. The combination of a carriage, a cylindrical platen thereon, and guiding devices on the carriage comprising a chute through which a work sheet passes as it is wound on the platen during a rotation of the latter in one direction, and a receiving guide adapted to receive the same work sheet as it is led away from the platen during a rotation of the platen in the opposite direction to unwind the sheet therefrom, said chute and guide being mounted for movement together around a common pivotal center to and from effective position.

34. The combination of a carriage, a cylindrical platen thereon, guiding devices on the carriage comprising a chute through which a work sheet passes as it is wound on the platen during a rotation of the latter in one direction and a receiving guide adapted to receive the same work sheet as it is led away from the platen during a rotation of the platen in the opposite direction to unwind the sheet therefrom, said chute and guide being mounted for movement together around a common pivotal center to and from effective position, and means for locking said chute and guide in either of said positions.

35. The combination of a stationary means for supporting a supply for work sheets, a traveling carriage adapted to move into and out of widthwise register with the work sheets supported by said supporting means and to receive said work sheets one at a time, hand controlled means for adjusting the work sheets on said carriage in condition to receive writing, and means for preventing the operation of said last recited means except when the carriage is in register with work sheets supported by supporting means.

36. The combination of a stationary device for supporting paper, a paper carrying device provided with a chute that travels transversely of said stationary device into and out of alignment therewith, means for forcibly feeding paper through said chute, and automatically operating means for preventing an operation of the paper feeding means except when said two devices are in alignment.

37. The combination of a carriage, a rotary platen carried thereby, platen rotating means, locking means that prevent a rotation of the platen by said platen rotating means, and automatically operating means for freeing said locking means when the carriage reaches a predetermined point in its travel.

EDWIN E. BARNEY.

CERTIFICATE OF CORRECTION.

Patent No. 1,923,771. August 22, 1933.

EDWIN E. BARNEY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 6, lines 63-64, for "carriage-carrier" read carriage-carried; page 9, line 9, claim 31, after "thereby," insert the words and comma platen locking means,; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of December, A. D. 1933.

F. M. Hopkins

(Seal)

Acting Commissioner of Patents.