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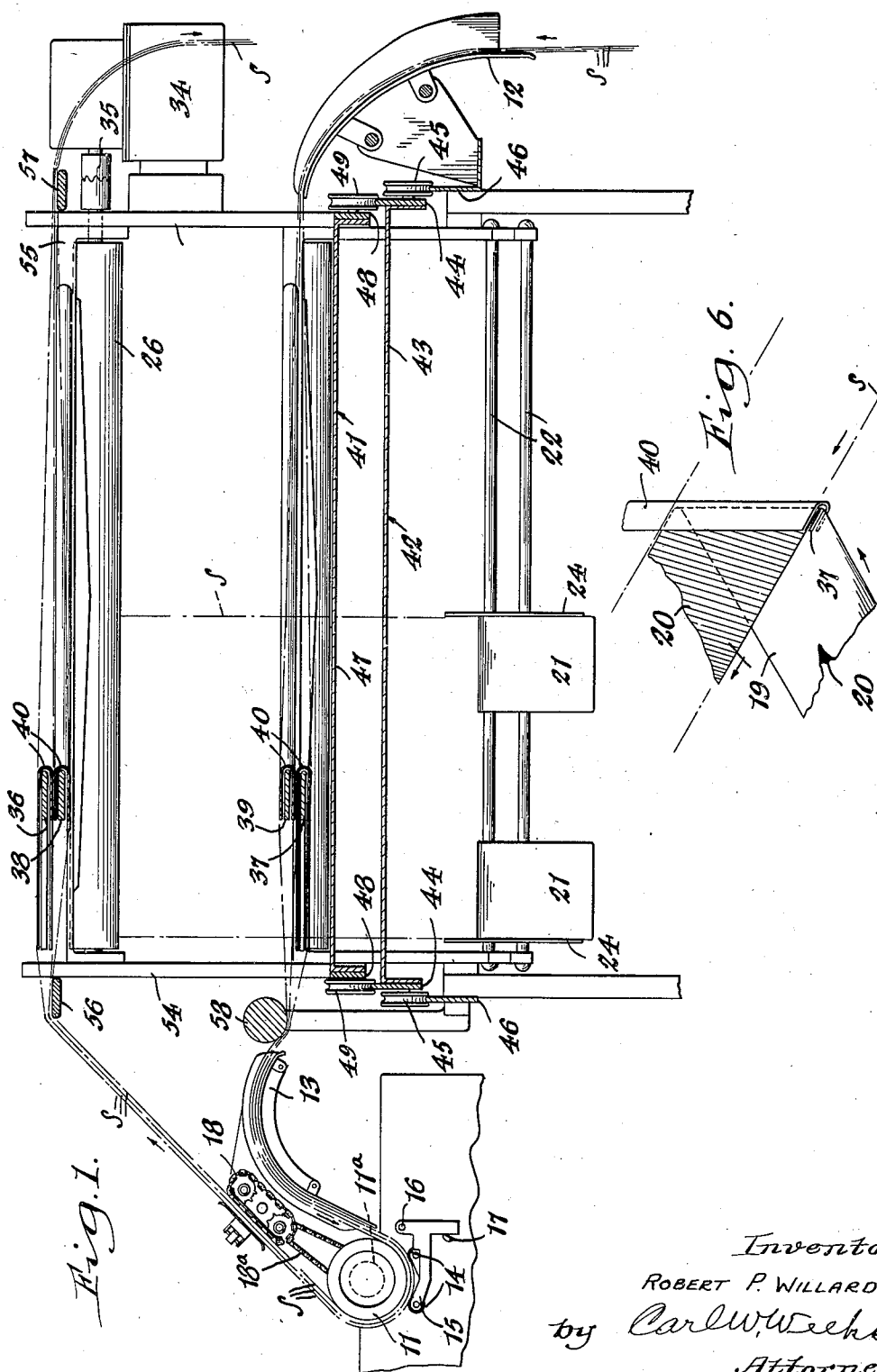
R. P. WILLARD

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RECORD AND CARBON STRIP CONTROL FOR WRITING MACHINES

Filed Dec. 6, 1941

4 Sheets-Sheet 1



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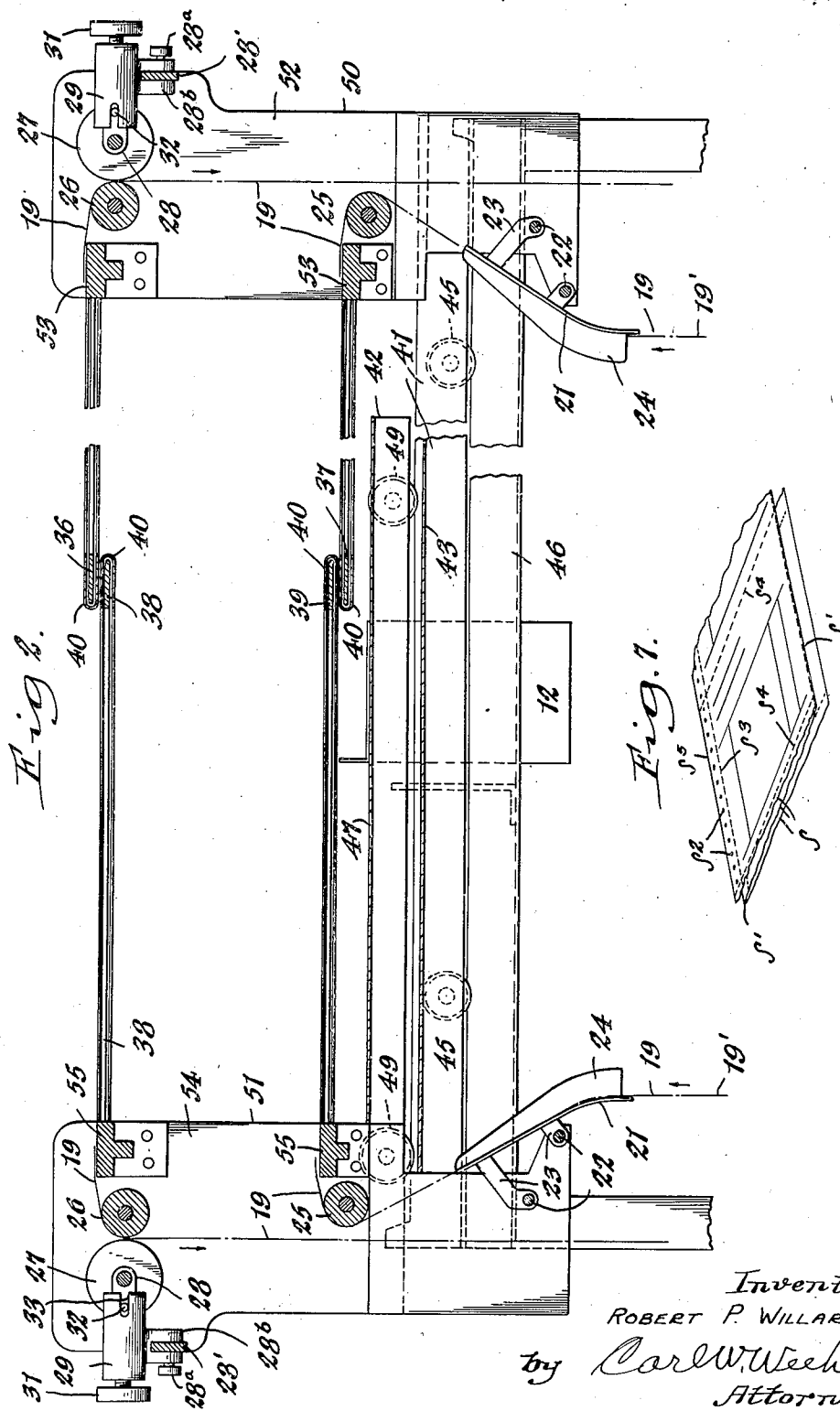
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RECORD AND CARBON STRIP CONTROL FOR WRITING MACHINES

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4 Sheets-Sheet 2



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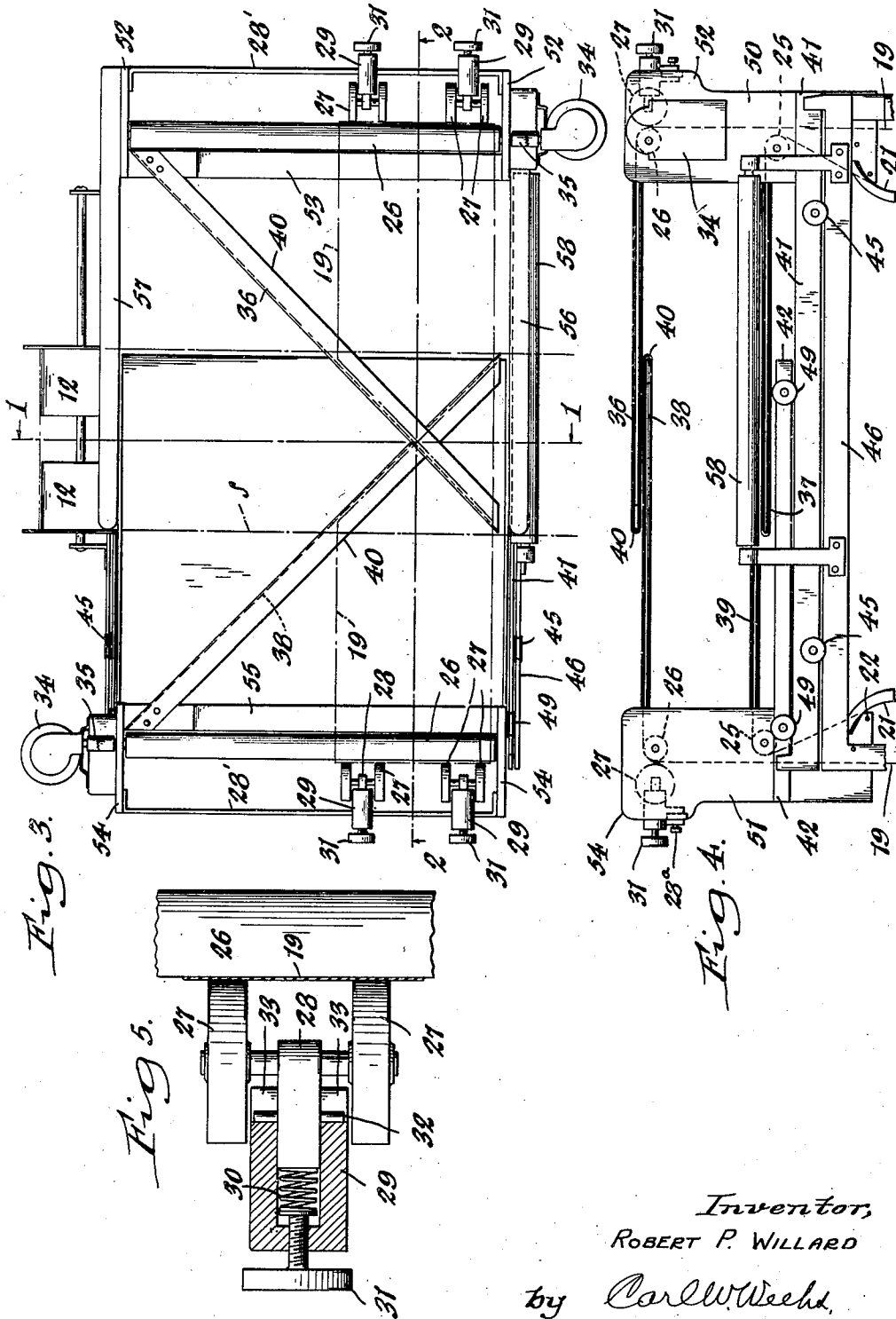
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RECORD AND CARBON STRIP CONTROL FOR WRITING MACHINES

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4 Sheets-Sheet 3



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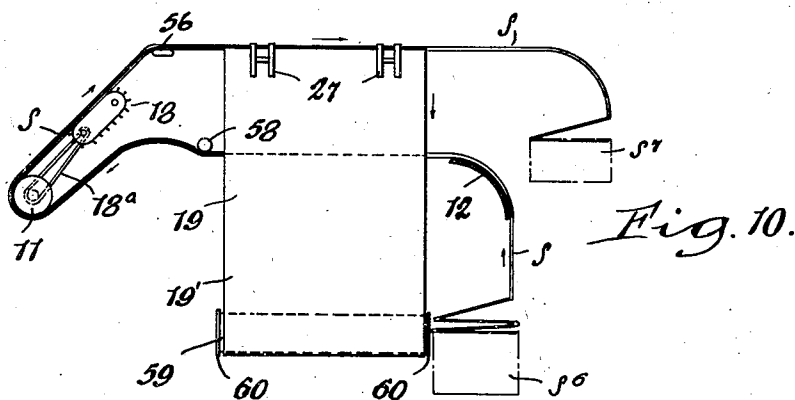
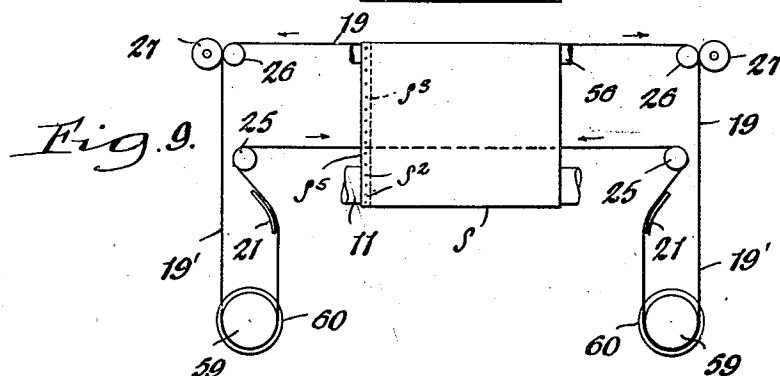
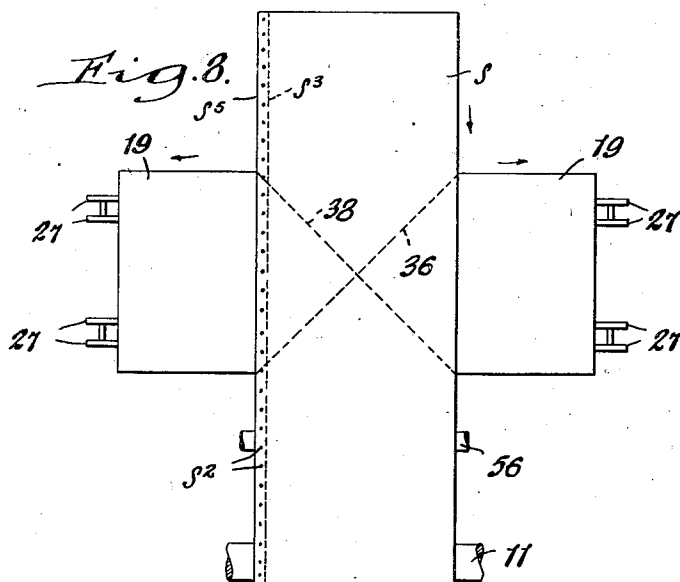
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RECORD AND CARBON STRIP CONTROL FOR WRITING MACHINES

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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RECORD AND CARBON STRIP CONTROL
FOR WRITING MACHINESRobert P. Willard, Lewiston, N. Y., assignor to
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19 Claims. (Cl. 197—134)

This invention relates to improvements in writing machines and the like, and more particularly to improved means for feeding and controlling the record and transfer or carbon strips ordinarily utilized in such machines for receiving the record inscriptions and for transferring the same to make copies.

It is a general object of the invention to provide an improved strip controlling and feeding mechanism of the class mentioned wherein the transfer or carbon strip or strips are separately controlled and fed into interleaved transfer relation with the record strips, whereby separate feeding means for the transfer strip contributes to the feeding and positioning of the record strips.

A further object of the invention is to provide an improved feeding and controlling means for a continuous endless transfer strip, whereby the latter can be introduced into interleaved relation with the record strips and moved conjointly therewith into inscribing position after which the transfer strip is removed from transfer relation with the record strips and maintained in a reserve section or loop for reintroduction in transfer relation with succeeding record receiving parts of the record strips of the long continuous traveler type.

Still another object of the invention is to provide an improved feeding mechanism for the continuous endless transfer strip, so constructed and arranged as to provide an auxiliary means for advancing the record strips as the inscription progresses, and that is capable of operating to exert continuous feeding effort upon the transfer strip both during periods of movement and periods of rest in record strip advancement.

A further object of the invention is to provide improved guiding means for guiding the endless transfer strip to and from interleaved transfer relation with the record strips, and for providing for separate or unitary lateral adjustment of the guiding means for the accommodation of different widths of record and transfer strips.

A further object is to provide an improved guiding means for turning and guiding the transfer strip from a course transverse to that of the record strips into the course of the record strips in transfer relation therewith, and to provide an improved means for avoiding the fouling or interruption to the feeding and positioning of the strips with each other.

Other objects of the invention will be in part pointed out in the following detailed description of an illustrative but preferred embodiment of

the invention, and will be in part obvious as the disclosure proceeds.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a more comprehensive disclosure of the nature, objects and advantages of the invention, reference is had to the following detailed description of the illustrative embodiment, and to the accompanying drawings in which:

Fig. 1 is a partially diagrammatic vertical longitudinal section of a writing or tabulating machine embodying the invention, parts being omitted, the section being taken approximately on the line 1—1 of Fig. 3;

Fig. 2 is a transverse vertical section taken approximately on the line 2—2 of Fig. 3;

Fig. 3 is a plan view of a part of the machine shown in Figs. 1 and 2;

Fig. 4 is a side elevation of Fig. 3 looking upwardly toward the lower side thereof;

Fig. 5 is an enlarged fragmentary detail plan view, partly in horizontal section, of the feed mechanism for the transfer strip;

Fig. 6 is a fragmentary detail perspective view of the guiding and turning means for the transfer strip;

Fig. 7 is a fragmentary partially diagrammatic perspective view of a fragment of a record assembly of the long continuous traveler type such as ordinarily employed in machines of this kind;

Fig. 8 is a diagrammatic plan view showing the relative positions of the record and transfer strips;

Fig. 9 is a further diagrammatic view in elevation showing the manner of feeding and interleaving the endless carbon strips with the record strips; and

Fig. 10 is also a diagrammatic view in side elevation illustrating the courses of the record and transfer strips.

Referring to the drawings for a detailed description of the preferred embodiment of the invention there shown, the improved record and transfer strip controlling mechanism has for illustrative purposes been shown as embodied in a typewriting or tabulating machine of the type disclosed in the Mabon Patent No. 2,171,003, dated August 29, 1939. The structural framework of this machine may be of any known preferred design and is herein disclosed only in a fragmentary partially diagrammatic manner. This ma-

chine embodies a rotary cylindrical platen 11 on which the long continuous traveler record strips S are supported for the reception of inscriptions by means of well-known type mechanism (not shown) as illustrated, for example, in the prior Mabon patent referred to. These record strips S are ordinarily led from a suitable supply source such as a zigzag folded supply pack S⁶ over an appropriate guide 12 to the paper table 13 and thence to the platen. Pressure rolls 14 may be used to press the record strips into close contact with the cylindrical writing surface of the platen, these rolls being mounted in well-known manner upon a supporting arm 15 pivoted at 16 and controlled by an operating member or rotary cam 17 to release the pressure of the pressure rolls, or to cause them to press in operative position against the platen surface.

Positioned beyond the rotary platen 11 is a record strip feeding mechanism indicated generally at 18. Although the strip feeding mechanism may vary in construction insofar as this invention is concerned, it is herein disclosed as being of the pin feed type wherein feed pins are mounted for traveling movement and are supported upon a flexible traveling chain as disclosed in the prior Mabon patent referred to. The feed pins of this feeding mechanism engage in a series of pin feed apertures formed in one or both of the longitudinal marginal portions of the long continuous record strips. This pin feed mechanism 18 may be driven in any appropriate manner. For example, power transmitting connections may be provided for transmitting the platen movement to the pin feed mechanism 18. These connections may be similar to those disclosed in the aforesaid Mabon patent and are diagrammatically indicated in Figs. 1 and 10 by means of the connection 18a interposed between the platen shaft and a rotary driving shaft of the feed unit 18. The platen may be rotated manually through the knob 11a, or by other means.

A type of stationery or record strips for which the improved mechanism is adapted, is disclosed in Fig. 7 of the drawings. As there shown, the record strips S are of the long continuous traveler type and may be fanfolded along longitudinal edge portions as indicated at S', or these strips may be separate individual strips, each having opposite free edge portions, one or both longitudinal marginal portions of the record strips of the assembly are formed with a longitudinal series of pin feed apertures S² of the nature fully described in the Mabon patent. Also, each strip S may have a longitudinal weakened severance line S³ running adjacent to and inside of the apertures S² so as to form a detachable feed band S⁵ that may be easily disconnected or severed from the strips after the writing has been completed. Also, the strips may have appropriate blank forms for receiving the inscriptions, and they are provided with transverse weakened severance lines S⁴ spaced at form length intervals, whereby the inscribed sets of forms or form leaves can be easily severed from the complete assembly.

Heretofore considerable difficulty has been experienced in introducing the transfer material into transfer position with the record strips in cases in which the transfer or carbon strips have not been previously assembled with the record strips prior to loading such strips into inscription receiving relation in the writing machine. According to the present invention, an improved arrangement has been devised whereby the trans-

fer strip or strips can be introduced in transfer relation during the feeding of the long continuous traveler record strip assembly into writing position in the writing machine. This improved mechanism, as herein disclosed, embodies one or more continuous endless transfer or carbon strips 19. Although the carbon strips 19 are preferably endless as disclosed, they may for some purposes be made of long continuous strips of transfer material but not of the endless type. In such a case each transfer strip would ordinarily be fed from a supply source such as a roll or zigzag pack into transfer relation with the record strips and the forwardly fed end of each strip could be disposed of as desired. Where the endless transfer strips are used, as clearly shown in Fig. 9, it is continuously fed or moved into transfer relation with the record strips, and after it has been once used it can be reintroduced in transfer relation and used again. The transfer strip may be thus used again and again until the transfer surface becomes depleted. Each transfer strip 19 is preferably coated with transfer material 20 on but one side thereof, as shown, but for some purposes it may be thus coated on both sides. This strip may be made of appropriate material such as flexible sheet material that is sufficiently stout and tough to be used over and over again for repeated transfer use and to be fed by the improved feeding mechanism into interleaved relation with the record strips, and also fed from such interleaved relation. It may, for example, be made of paper of appropriate quality or of a woven textile fabric.

For guiding and directing the endless transfer strips 19 to and from interleaved transfer relation with the record strips S, guide plates 21 are mounted at opposite sides of the writing machine on appropriate supporting rods 22 attached to the frame. For this purpose each guide plate 21 has supporting lugs 23 attached thereto and provided with apertures for receiving the supporting rods along which the respective guide plates are adjustable. Each guide plate may be constructed of appropriate material such as metal, and has an inwardly and downwardly curved supporting surface on which the transfer strips 19 rest, and also outer upwardly extending edge guides or flanges 24 positioned for guiding engagement with the opposite longitudinal edges of the transfer strips.

Positioned above the guide plates 21 are lower guide rolls 25 and upper guide rolls 26, the latter serving as feed rolls for the transfer strips, as later described. The guide rolls 25 are preferably of relatively light material and are mounted for rotation on anti-friction bearings.

Mounted adjacent to the feed rolls 26 are rider rolls or trucks 27 pressed into frictional engagement with the feed rolls. As best seen in detail in Fig. 5, each of these rider rolls or trucks 27 is rotatably mounted upon a reciprocating plunger support 28 mounted in a socketed supporting member 29 and yieldingly urged outwardly by means of a coil spring 30 under compression. The stress of the compression spring 30 may be adjusted by means of an adjustable thumb screw 31. The plunger support may be additionally supported in its operative position by means of a transverse supporting rod or pin 32 seated in a transverse aperture therein and engaging in opposing slots or seats 33 in the plunger support 29. Thus it will be seen that the endless transfer strips 19, being interposed between the rider truck roll 27 and the guiding and feeding roll

26, are engaged with a friction grip that can be adjusted by minute increments by means of the adjusting screws 31.

Each of the guiding and feeding rolls 26 is separately and individually driven to feed the endless transfer strips by means of a small electric motor 34 appropriately mounted on the machine and having a driving coupling 35 with the respective feed roll 26. This driving coupling 35 may be released or set in operative driving position by means of appropriate mechanism (not shown). Each driving motor 34 is preferably connected to a supply source of electric power through an appropriate switch so that each motor can be controlled independently of the other. Also, each driving motor 34 when connected to the power source runs continuously so as to rotate the feed rolls 26 continuously to exert constant feeding effort upon the endless transfer strips.

Guiding and positioning devices are provided for the endless transfer strips 19 for guiding them to and from interleaved transfer relation with the record strips S, and for turning them at an angle of substantially 90° from a course transverse to that of the record strips, into the longitudinal course of the latter. These guiding and positioning devices include upper and lower strip guides or angle guide bars 36 and 37 positioned and supported at one side of the course of the record strips and disposed at a convenient angle to the course of the record strips to turn the transfer strips into the course of the latter, and to guide them into transfer relation with the record strips. A satisfactory angle for this purpose is about 45° to the course of the record strips, as shown in Fig. 3. This guiding and positioning means also includes an upper guiding angle bar 38 and a similar lower angle bar 39, similar respectively to the angle bars 36 and 37 but positioned and supported at the opposite side of the course of the record strips.

Each of the strip guiding angle bars 36, 37, 38 and 39 is provided with a strip guiding sleeve or shield partially enclosing or surrounding the respective angle bar. These shields 40, as shown, are substantially U-shaped with the bends thereof extending around the forward or strip guiding and turning edges of the respective angle bars. Each shield 40 is spaced a short distance from the corresponding angle bar both at the sides and bend thereof to provide sufficient space or passageway for receiving the transfer strips 19. These shields 40, as later more fully described, guide and protect the transfer strips from such engagement with the record strips as might interfere with the free feeding movements of both the record and transfer strips.

Supporting and adjusting means are provided for the angle guide bars 36, 37, 38 and 39 so as to vary their position relatively to the course of the record strips, and for the accommodation of record and carbon strips of different widths. This supporting and adjusting means in the embodiment shown includes two carriages adjustable transversely of the record strip course, the lower carriage indicated generally at 41 supporting the angle bars 36 and 37, and the upper carriage indicated generally at 42 supporting the angle bars 38 and 39. The lower carriage 41 may have any appropriate framework, that shown partially diagrammatic herein including a horizontal frame plate 43 to which are connected transverse frame members 44. The lower carriage 41 is provided with trucks or wheels 45

running on tracks 46 that also serve as transverse frame members of the writing machine. The upper carriage 42 also has a horizontal frame plate 47 to which are connected transverse frame members 48 carrying wheels or trucks 49 running upon transverse tracks formed by the transverse frame members 44 of the lower carriage 41. Thus, the lower carriage is supported for transverse adjustment of the writing machine upon the tracks 46, while the upper carriage 42 is similarly supported for adjustment transversely of the writing machine upon the tracks 44 forming a part of the lower carriage.

As shown at the right in Figs. 2, 3 and 4, there is an upright framework 50 connected to and forming a part of the lower carriage 41 at the right side of the latter. Also, as seen at the left of these figures, there is a similar upright framework 51 similarly connected to and forming a part of the upper carriage 42 and rising above the left side thereof. These two frameworks 50 and 51 form unitary parts of the respective carriages 41 and 42 and move with the carriages when the latter are adjusted laterally of the writing machine upon their supporting tracks. The framework 50 includes upright frame members 52 and longitudinal frame members 28' and 53, while the framework at the left has similar upright frame members 54 and longitudinal frame members 28' and 55. The longitudinal frame members are connected at their opposite ends to the upright frame members to provide a strong supporting structure. As shown in Figs. 2 and 3, the upper angle guide bars 36 and 38 are respectively connected to and supported by the upper longitudinal frame members 53 and 55, while the lower angle bars 37 and 39 are similarly connected to and supported by the lower longitudinal frame members 53 and 55. Additional support for the angle bars and for their respective shields 40 may be provided if desired. It will be noted that the upper angle bars 36 and 38 are positioned in the upper path of the record strips S as the latter pass from writing position to the rearward, as viewed in Fig. 1. The lower angle bars 37 and 39 are similarly positioned in the lower path of the record strips as the latter move from the source of supply S⁶ toward writing position upon the platen 11. Each of the angle bars has a free extremity opposite to its point of support so that it can be projected into the fold provided by the longitudinal folds S¹ of the fanfolded record strips above described.

Forward and rearward strip guide bars 56 and 57 are supported at one extremity thereof by the upright framework 50, extending from their points of support into the upper course or path of the record strips S. Thus, the guide bar 56 serves as a guide positioned to the rearward of the feed mechanism 18 for guiding the strips into the upper course adjacent to the upper angle guide bars 36 and 38, and the guide bar 57 serves as a guide for the record strips as they leave the machine in the rear where they are either folded into a zigzag pack S⁷, or the like, or torn off and disposed of as desired. Also, there is a guide bar or roller 58 positioned just to the rear of the paper table 13 for guiding the strips from their lower course adjacent to the angle bars 37 and 39 into inscription receiving position upon the platen 11.

Referring particularly to Figs. 2 and 9 of the drawings, it will be noted that there are reserve transfer strip portions 19', one for each of the

endless transfer strips 19. Each endless transfer strip is of sufficient length to have portions thereof extending in interleaved transfer relation with the record strips S over the inscription receiving portions thereof at the platen 11, and still leave enough length of the strip to extend from such transfer position at one of the lateral sides of the course of the record strip assembly, and to provide for the reserve portion 19'. This reserve portion will be of sufficient extent or volume so that the transfer strip as it is moved to and from inscription position can accumulate so as to form a limited reserve section or supply. Portions of the transfer strip are stored temporarily in this reserve section and fed therefrom into transfer relation with the record strips.

As shown in Fig. 9, it is convenient to dispose this reserve section or supply 19' in the form of a depending loop depending from the guide rolls 25 and the feed rolls 26. In order to retain each reserve section or loop in its correct position and to avoid damage or incorrect positioning or fouling of the transfer strip, a guiding and positioning device may be utilized. In the embodiment shown this device is in the form of a floating positioning roller 59 resting by gravity in the lower end of the reserve loop 19'. This positioning roller is preferably made of light material such as wood or fiberboard or even light sheet metal, and is preferably circular in cross section, as shown, and provided with end flanges 60. The roller is thus suspended within the lower end of the reserve loop, resting by gravity therein so as to maintain the loop in its correct operative position. The inner branch of the reserve loop runs over a guide plate 21 and from thence to the guide roll 25 into interleaved transfer relation with the record strips. The guide 21 preferably has a curved smooth guiding surface contacting with the adjacent surface of the transfer strip. It will be noticed that the back of the transfer strip, or surface that is uncoated with transfer material, will contact with the guiding surface of the guide plate 21 so as to avoid undue friction and prevent damage to the coating of transfer material. The side or surface of the transfer strip that is coated with the carbon or transfer material is disposed outwardly away from the guide plate 21, and is disposed downwardly at the portion or stretch of the strip between the guide roll 25 and the adjacent angle guide bar 37. But as the transfer strip is turned into the longitudinal course of the record strips, as shown in detail in Fig. 6, this transfer surface will be turned to face upwardly, thus bringing it into correct position for transfer inscriptions as the combined assembly of record and transfer strips passes over inscription receiving position upon the platen 11.

It will be understood that the arrangement of each endless transfer strip, and the guiding and controlling means therefor, will be the same in each instance in cases where more than one transfer strip is utilized. Two such endless transfer strips are shown in the illustrative embodiment, but in some cases one will be sufficient and where more than three superposed record strips are employed it will be understood that there will be one of these endless transfer strips for each copy record strip and appropriate controlling means therefor. Inscriptions are usually made upon the top or original record strip by means of appropriate inking ribbons cooperating with the type of the type bars in a manner well-known in the art.

In view of the foregoing detailed description of an illustrative embodiment of the invention, the operation for making manifold inscriptions will be understood by those skilled in the art, and may be summarized as follows.

Ordinarily each of the endless transfer strips will be first threaded into position in the machine. A strip of transfer material is cut from a supply to have a sufficient length with free ends to form the endless transfer strip. One end of this strip is then threaded around the appropriate angle guide bar 37, beneath the U-shield 40, and the forward end thereof with the transfer surface upwardly, as seen in Fig. 6, is pulled forwardly under the guide roll 58, over the platen 11 and thence rearwardly over the guide 56 to the upper angle guide bar 36. It is then threaded over the guide bar 36 and beneath the U-shield 40 and the end thereof turned and drawn transversely outwardly and positioned over the feed roll 26. The opposite end of the transfer strip is then positioned over the guide roll 25 and the guide plate 21, and the two ends of the strip brought together at the loop 19' and spliced so as to make a continuous transfer strip. The splice may be formed by butting or lapping the two opposite ends of the strip together and fastening them in this position by means of a strip of adhesive tape or similar material. When the strip is thus positioned, there will be sufficient length to provide the reserve section or loop 19'. When additional endless transfer strips are required, they will be threaded into position as described. The floating positioning rollers can then be placed in position in the depending loops 19', or they can be placed in position later after the record strips have been threaded into position.

To thread the assembly of fanfolded transfer strips into writing position in the machine, the forward end of the assembly is led forwardly from the supply such as the zigzag folded pack S⁶ or from a roll (not shown), and extended over the rear guide plate 12 and thence to the lower angle guide bars 37 and 39. In cases where there are three fanfolded record strips, as shown, the upper angle guide bar 39 is introduced into the upper fold of the assembly and the lower angle guide bar 37 is introduced into the lower fold. The record assembly is then pulled forwardly relatively to the transfer strips and the forward end thereof is introduced into the feed grip at the lower side of the platen 11. Up to this point the transfer strips are not moved longitudinally but are in interleaved transfer relation with the forward ends of the record strips. The platen is then rotated to feed the assembly of record and transfer strips forwardly, the transfer strip feed rolls 26 also being rotated either by hand or by operation of the motors 34 so as to feed the transfer strips forwardly over the platen as the record strips are being fed. The complete assembly of record and transfer strips is thus led forwardly over the guide 56 and to the upper angle guide bars 36 and 38, these being then positioned in the upper and lower folds of the fanfolded record strip in the manner described in connection with the lower angle bars 37 and 39. The forward ends of the record strips may be inscribed on the platen 11, if desired, prior to the threading thereof on the angle bars 36 and 38. Also, at any appropriate time the longitudinal marginal feed bands having the pin feed apertures S² will be placed in feeding engagement with the pin feed unit 18. When thus

threaded, the machine is in condition for continuous inscribing operation.

As inscription of the assembly progresses the complete assembly will be moved forwardly step by step to effect line spacing and the inscriptions will be entered during periods of rest. This feeding of the assembly will be accomplished by operation of the platen 11 and the pin feed mechanism 18, as fully described in the Mabon patent above referred to. At the same time, a constant forward feeding effort will be exerted upon each of the endless transfer strips 19 by operation of the transfer strip feeding mechanism embodying the feed rolls 26 and the adjustable pressure truck rolls 27. For this purpose the driving motors 34 will be energized and run continuously, thus exerting the continuous feeding effort upon the transfer strips. At the same time this constant feeding effort will be exerted by the same means upon the record strips S because the transfer strips are interleaved in frictional contact therewith. Therefore, the part or stretch of the assembly above and beyond the pin feed mechanism 18 will be kept constantly under some tension sufficient to prevent sagging thereof and to promote the smooth feeding of the complete assembly past the upper angle guide bars 35 and 38.

During the periods of rest of the complete record assembly during entry of inscriptions, the feed rolls 26 will continue to rotate, but the frictional contact surface thereof will slide idly over the surface of the transfer strip. The magnitude of the feeding effort required for best operating conditions can be adjusted with accuracy through minute gradations by means of the pressure adjusting screws 31 to vary the pressure of the truck rolls 27 against the strips at the feed grip portion at the feed rolls 26. It will thus be seen that the endless transfer strips 19 will be fed forwardly step by step as the record strips are being fed, thus keeping fresh transfer material always in inscribing position at the writing surface of the platen 11.

As the transfer strips 19 are being fed, as just described, the upper parts thereof are turned from their longitudinal course in the record assembly, into a course transverse thereto into feeding engagement with the feed rolls 26 and thence into the reserve supply loops 19'. These reserve loops can thus expand and contract somewhat as required by the feeding action because of the depending loop and the upward and downward adjustment of the floating controlling roller 59. Transfer strips of different lengths are thus accommodated, and stretching or contraction compensated.

Similarly the endless transfer strips 19 are fed from this reserve supply or loop over the guide plates 21 and guide rolls 25 and over the lower angle bars 37 and 39, this feeding action being effected by the forward pull upon these strips by action of the rotation of the platen and feeding movement of the pin feed mechanism 18, assisted by the constant feeding effort exerted upon the endless transfer strips by the transfer strip feeding mechanism. As the inscribed portions of the record strips S are fed beyond the upper angle bars 35 and 38, they pass over the guide bar 57 and are folded by any appropriate means into an appropriate assembly such as the zigzag folded pack S' shown in Fig. 10.

In case endless transfer strips of different widths are required, the guide plates 21 can be relatively adjusted along the supporting rods 22 to accommodate any width of strips. Different

widths of record strips can be similarly accommodated by relative adjustment of the guide plates 12. When it is desired to introduce the transfer strips in different positions transversely of the record assembly or of the machine, this can be accomplished by adjusting the two guide plates 21 at either side of the machine together as a unit along the supporting rods 22.

Also, the operative positions of the angle guide bars 36, 37, 38 and 39 can be adjusted by moving their supporting carriages on their supporting rails 44 and 46. Any appropriate means may be provided for securing these carriages in adjusted positions. The upper carriage 42 can thus be adjusted independently of the lower carriage for adjustment of the angle bars 38 and 39 laterally of the record strips course. Also, all of the angle guide bars can be adjusted as a unit laterally of the record strip course by adjustment of the lower supporting carriage 41. When the lower carriage is thus adjusted one way or another, it carries with it the upper carriage 42 unless the latter is restrained from such movement. If it is desired to adjust the angle bars 36 and 37, without at the same time adjusting the angle bars 38 and 39, this can be accomplished by restraining the upper carriage 42 from movement and at the same time adjusting the lower carriage 41 along its supporting rails. By means of this simple and effective adjusting arrangement, record and transfer strips of any desired width can be accommodated, and the course of the record strips along the writing machine can be laterally adjusted so as to bring the record strips into different inscription receiving positions along the length of the platen 11.

From the foregoing detailed description it will be seen that the bottom record strip S of the assembly is frictionally engaged by the surface of the platen 11, and that it is fed forwardly by the conjoint action of the platen and the pin feed unit 18. The pressure of the record strips against the platen can be released by releasing the pressure rolls 14. The transfer strips 19 do not engage the feed pins of the feed unit 18 but are fed forwardly by frictional engagement with the record strips. The transfer strips are also fed by the constant feeding effort thereon exerted by the frictional feed rolls 26, but the pull of this feeding mechanism is adjusted so that there is not sufficient effort to pull the transfer strips forwardly relatively to the record strips. However, this feeding effort upon the transfer strips is sufficient to move the transfer strips exactly in accordance with the feeding movement of the record strips. It will be seen also that the feeding effort upon the transfer strips assists in the feeding of the record strips, particularly at the parts of the record assembly beyond the pin feed unit 18. This method of applying feeding effort to the transfer strips helps to maintain the strips in proper registry and it is also effective in lowering the power requirements for driving the inscribing machine.

It will also be seen that pressure trucks 27 of the transfer strip feeding mechanism can be adjusted to different operative positions along the length of the respective feed rolls 26 merely by sliding the plunger supports 28 to different positions along the supporting bar 28' and securing them in adjusted operative position by means of the set screws 28a threaded to slotted attaching lugs 28b connected to the plunger supports 28.

It will be noticed that the shields 40 for the angle guide bars for the carbon strips prevent any contacting of the forwardly moving record

strips with the transfer strips as the latter are being turned about these angle bars. Fouling of the strips with one another, interference to feeding thereof, and also damage to the strips are thus effectually avoided.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, separate means positioned laterally outside of the course of said record strips and being continuously operated for feeding a transfer strip in transfer relation with said record strips, guide means for guiding the transfer strip from a course transverse to that of said record strip into the course of said record strip, and means for adjusting said transfer strip feeding means to render it capable of feeding the transfer strip only during operation of the record strip feeding means.

2. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, separate feeding means positioned laterally outside of the course of said record strips and engaging a transfer strip separated from the record strips to feed it in transfer relation with said record strips whereby feeding of the transfer strip will exert feeding effort on the record strips, guide means for guiding the transfer strip for travel from a course transverse to that of said record strips into the course of said record strips, said guide means including a guide bar inclined to the course of the record strips, and a shield extending along said guide bar, and being U-shaped and enclosing the rearward or guiding edge of said bar to avoid fouling of the record and transfer strips, said shield being spaced from said guide bar to form a U-shaped passageway for the free passage of said transfer strip.

3. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, guide means including a guide bar inclined to the course of said record strips for guiding a transfer strip during feeding movements thereof over said bar from a course transverse to that of said record strips into the course of said record strips, and a U-shaped shield extending along and enclosing the guide edge of said guide bar and spaced therefrom at both sides of the bar to form a U-shaped passageway for free passage of said transfer strip during said feeding movements thereof.

4. In a machine of the character described, in combination, a writing platen, strip feeding means for feeding record strips over said platen, guide means for guiding and positioning an endless transfer strip in interleaved transfer relation with said record strips on said platen, said endless transfer strip having a reserve section outside of the course of said record strips, feeding means separate from said first mentioned strip feeding means for feeding said transfer strip to said reserve section, and a controlling device for said reserve section automatically adjustable to compensate for expansion or contraction thereof.

5. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, separate means for feeding an endless strip of transfer material in the longitudinal course of the record strips when in transfer relation therewith, so that feeding of the endless transfer strip exerts feeding effort upon the record strips, guide means for turning said endless transfer strip to and from the course of said record strips, said endless transfer strip having a reserve portion separate from the record strips and positioned in a vertical plane spaced laterally from the record strips outside of the record strip course, and means for controlling and guiding said endless transfer strip at said reserve portion.

6. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, separate means for feeding an endless strip of transfer material in the longitudinal course of the record strips when in transfer relation therewith so that feeding of the endless transfer strip exerts feeding effort upon the record strips, guide means for turning said endless transfer strip to and from the course of said record strips, said endless transfer strip having a depending loop separate from the record strips and positioned in a vertical plane spaced laterally from the record strips outside of the course thereof, and means for controlling and guiding said endless transfer strip at said depending loop and including a floating controlling member engaging said loop.

7. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, and separate means for feeding an endless strip of transfer material in the longitudinal course of the record strips when in transfer relation therewith, said transfer strip feeding means including a continuously operating friction feed device having slipping frictional feeding engagement with the transfer strip alone when separated from the record strips, and adjusting means for adjusting the frictional feeding engagement of said transfer strip feeding means to render it capable of feeding the transfer strip only when said first mentioned feeding means is operating.

8. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, separate means for feeding an endless strip of transfer material in the longitudinal course of the record strips when in transfer relation therewith whereby feeding of the strip of transfer material will exert feeding effort on the record strips, said transfer strip feeding means including a continuously operating friction feed device having slipping frictional feeding engagement with the transfer strip when separated from the record strips, and means for controlling and guiding said endless transfer strip at reserve parts thereof intermediate the points of entering and leaving the course of the record strips, said controlling means being automatically adjustable to compensate for expansion or contraction of said reserve parts thereof.

9. In a machine of the character described, in combination, means for feeding record strips into inscription receiving position, separate means for feeding an endless strip of transfer material in the longitudinal course of the record strips when in transfer relation therewith whereby feeding of the strip of transfer material will exert feeding effort on the record strips, guide means for turn-

ing said endless transfer strip to and from the course of said record strips, said endless transfer strip having a reserve loop separate from the record strips, and means for controlling and guiding said endless transfer strip at said loop and including an automatically adjusting device to compensate for expansion and contraction of said loop, said transfer strip feeding means including a continuously operating friction feed device having slipping frictional feeding engagement with the transfer strip at parts thereof separated from the record strips.

10. In a machine of the character described, in combination, guide means for guiding an endless transfer strip laterally from transfer relation with one or more record strips into a reserve loop separated from the record strips and positioned laterally outside of the course of the record strips, and strip feeding means including a continuously operating friction feeding device engaging the transfer strip adjacent to said reserve loop to move it from transfer relation with the record strips.

11. In a machine of the character described, in combination, a writing platen, strip feeding means positioned beyond said platen for feeding record strips with a tractive effort over said platen, guide means for guiding and positioning an endless transfer strip in transfer relation with said record strips, guide means for guiding said endless transfer strip from transfer relation with said record strips, feeding means cooperating in feeding relation with said transfer strip at a part thereof separated from the record strips to draw it from transfer relation with the record strips and to position it in a reserve section in the form of a depending loop preparatory to introduction to said first mentioned guide means, and a floating controlling member for said reserve loop of the transfer strip.

12. In a machine of the character described, in combination, a writing platen, strip feeding means for feeding record strips over said platen, guide means for guiding and positioning an endless transfer strip in interleaved transfer relation with said record strips on said platen, said endless transfer strip having a reserve section outside of the course of said record strips, guide means for guiding said endless transfer strip from transfer relation with said record strips, impositive feeding means cooperating in feeding relation with said transfer strip outside of the source of said record strips to exert feeding effort insufficient to effect feeding movement of the record and transfer strips on said platen but sufficient to effect feeding movement of the transfer strip when said first mentioned strip feeding means is operated so as to draw the transfer strip from transfer relation with the record strips and to position it in said reserve section preparatory to introduction to said first mentioned guide means, and a guide located near said reserve section for positioning the transfer strip for transfer relation with the record strips.

13. In a machine of the character described, in combination, a writing platen, strip feeding means for feeding record strips over said platen, guide means for guiding and positioning an endless transfer strip in interleaved transfer relation with said record strips on said platen, said endless transfer strip having a reserve section outside of the course of said record strips, feeding means separate from said first mentioned strip feeding means for feeding said transfer strip to

said reserve section, said transfer strip feeding means being impositive so as to exert insufficient effort to feed the record and transfer strips on said platen but sufficient to feed the transfer strip to said reserve section when said first mentioned strip feeding means is operated, and a controlling device for said reserve section automatically adjustable to compensate for expansion or contraction thereof.

14. In a machine of the character described, in combination, a guide bar supported in inclined position with reference to the course of record strips for turning a transfer strip with reference to said course during feeding movements of said record and transfer strips, and a U-shaped shield for said guide bar to avoid fouling of the record and transfer strips during said feeding movements, said shield enclosing the guiding edge of said guide bar and being spaced therefrom above and below the bar to form a U-shaped passageway for the free passage of said transfer strip during said feeding movements thereof.

15. In a machine of the character described, in combination, a plurality of guide means for turning transfer strips positioned at opposite sides of the course of record strips with which the transfer strips are arranged in transfer relation, and a plurality of carriages respectively carrying said guide means, one of said carriages with its guide means being mounted for adjusting movements laterally of the record strip course and carrying a supporting rail upon which the other or upper carriage with its guide means is supported for adjusting movements laterally of the record strip course, whereby said carriages may be moved in unison to effect adjustment of said guide means in unison, and one carriage may be moved independently of another to effect adjustment of one guide means independently of another.

16. In a machine of the character described, in combination, a plurality of guide means for turning transfer strips positioned at opposite sides of the course of record strips with which the transfer strips are arranged in transfer relation, a plurality of carriages respectively carrying said guide means, one of said carriages with its guide means being mounted for adjusting movements laterally of the record strip course and carrying a supporting rail upon which the other or upper carriage with its guide means is supported for adjusting movements laterally of the record strip course, whereby said carriages may be moved in unison to effect adjustment of said guide means in unison, and one carriage may be moved independently of another to effect adjustment of one guide means independently of another, each of said carriages having an upright supporting frame carrying one of said strip guide means in elevated position spaced above another of said guide means whereby transfer strips may be guided and turned in upper and lower courses of the record strips, and feeding devices respectively mounted on said upright frames and cooperating in feeding relation with said transfer strips outside of the course of said record strips.

17. In a machine of the character described, in combination, a plurality of guide means for turning transfer strips positioned at opposite sides of the course of record strips with which the transfer strips are arranged in transfer relation, a plurality of carriages respectively carrying said guide means, and being adjustable laterally of the record strip course, each of said carriages having an upright supporting frame carrying one of said

strip guide means in elevated position spaced above another of said guide means whereby transfer strips may be guided and turned in upper and lower courses of the record strips; and feeding devices respectively mounted on said upright frames and cooperating in feeding relation with said transfer strips outside of the course of said record strips.

18. In a machine of the character described, in combination, separate feeding means including a slip friction feeding device, said feeding means cooperating for feeding record and transfer strips arranged in superposed transfer relation whereby feeding of a transfer strip by said slip friction feeding device exerts feeding effort on said record strip or strips, and means whereby said friction feeding device slides idly on the transfer strip engaged thereby so as to exert feeding effort thereon insufficient to feed the same except when another of said separate feeding means is operated; said transfer strip having a reserve loop positioned outside of the course of the record strips into which it is fed by said friction feeding device and

from which it is fed into transfer relation with the record strips.

19. In a machine of the character described, in combination, separate feeding means including a slip friction feeding device, said feeding means cooperating for feeding record and transfer strips arranged in superposed transfer relation whereby feeding of a transfer strip by said slip friction feeding device exerts feeding effort on said record strip or strips, means whereby said friction feeding device slides idly on the transfer strip engaged thereby so as to exert feeding effort thereon insufficient to feed the same except when another of said separate feeding means is operated; said transfer strip having a reserve loop positioned outside of the course of the record strips into which it is fed by said friction feeding device and from which it is fed into transfer relation with the record strips, and a controlling device for said reserve loop automatically adjustable to compensate for expansion or retraction thereof.

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