May 31, 1938. C. L. JOHNSTON 2,119,232

AUTOGRAPHIC REGISTER

Filed May 22, 1935 3 Sheets-Sheet 1

Fig. 2.

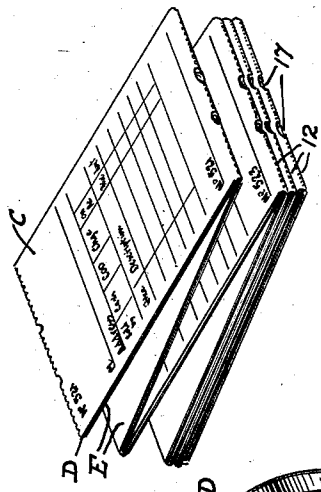


Fig. 1.

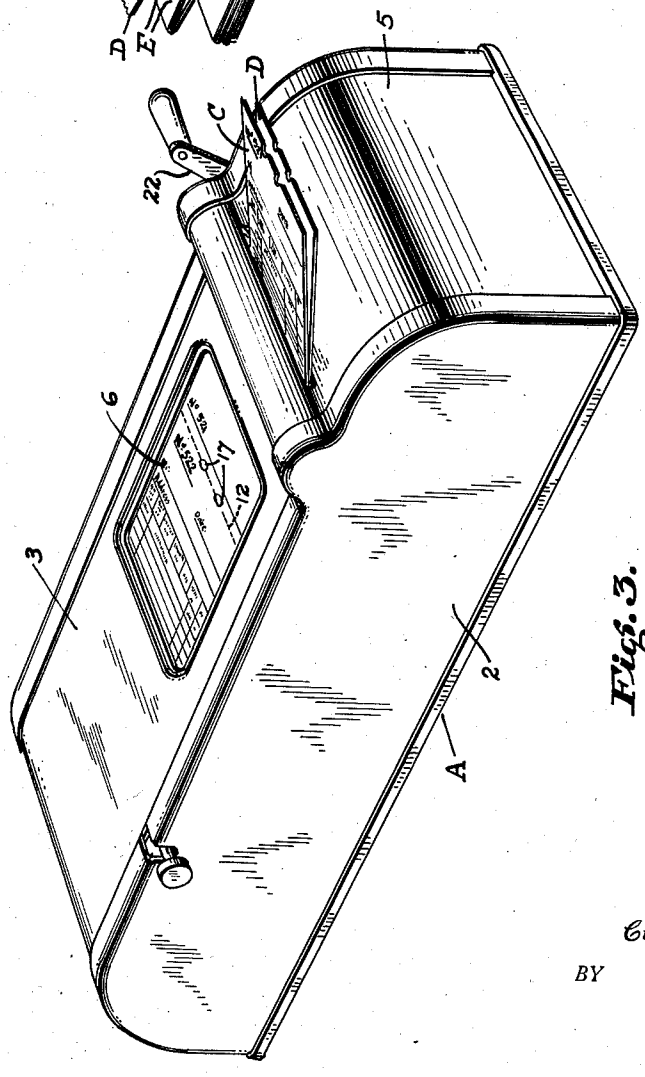
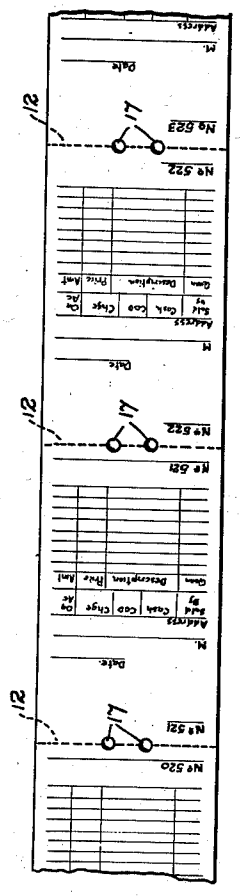


Fig. 3.



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AUTOGRAPHIC REGISTER

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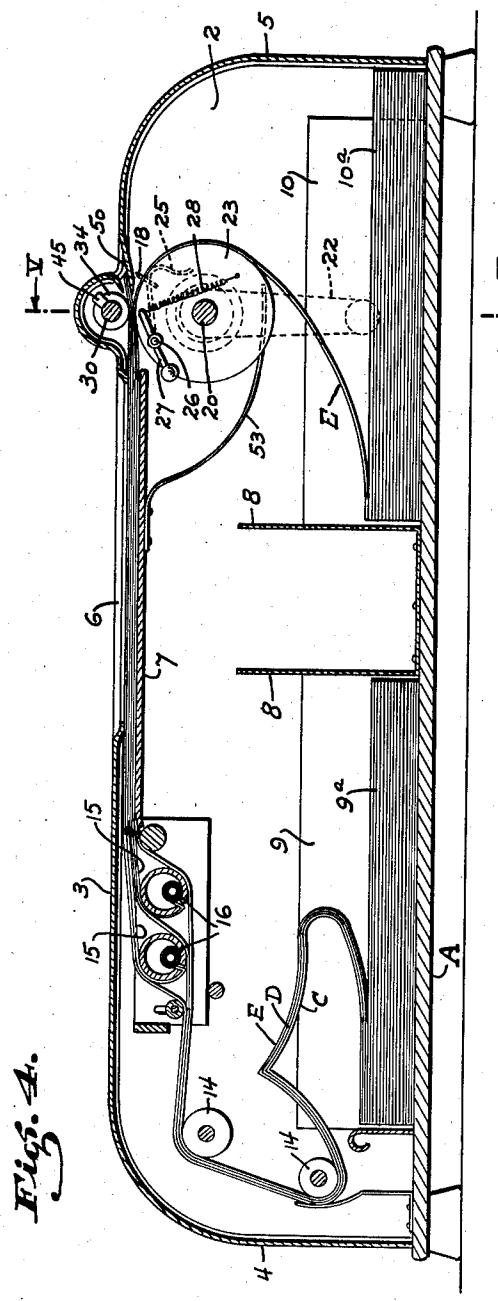

Fig. 4.

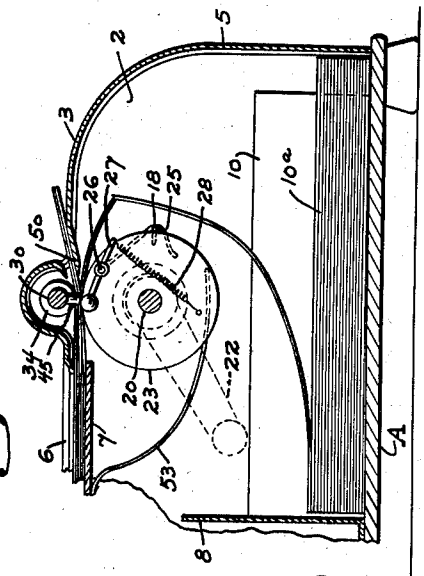

Fig. 6.

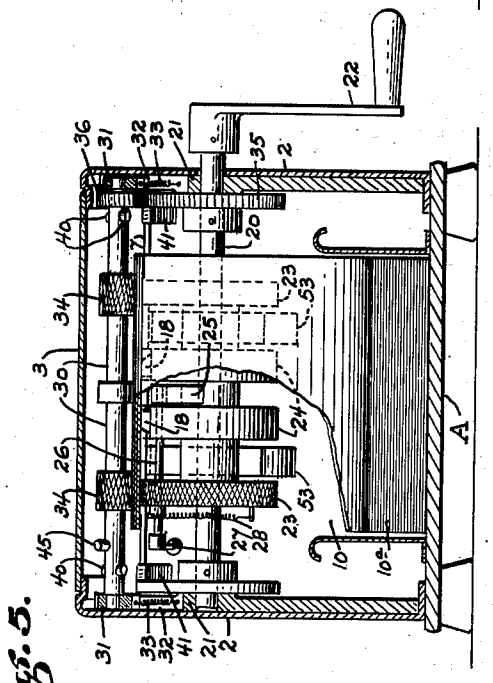

Fig. 5.

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AUTOGRAPHIC REGISTER

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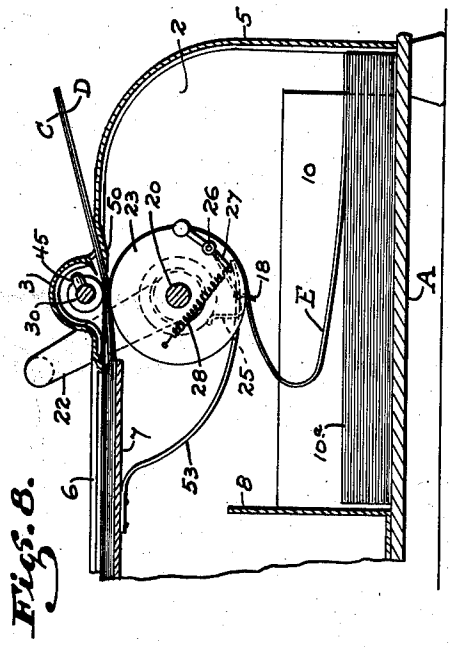

Fig. 8.

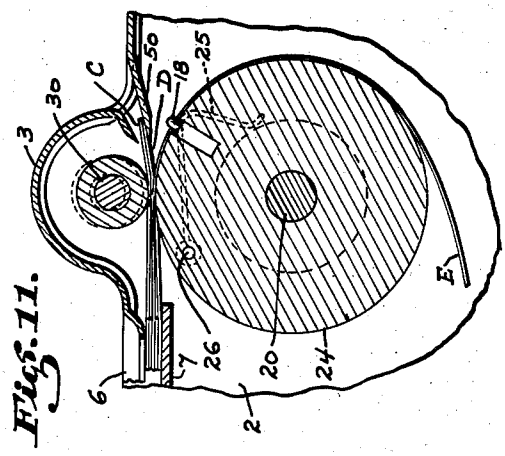

Fig. 11.

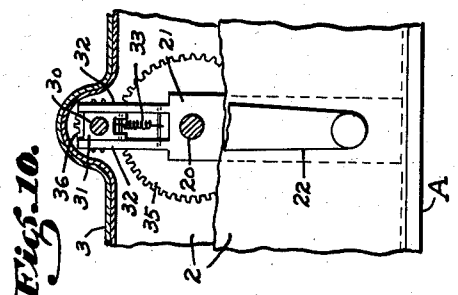

Fig. 10.

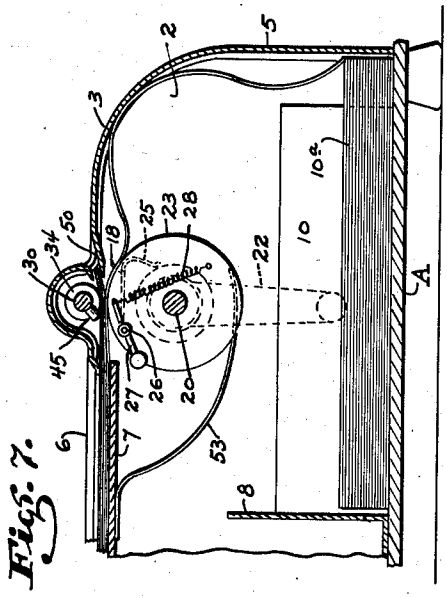

Fig. 7.

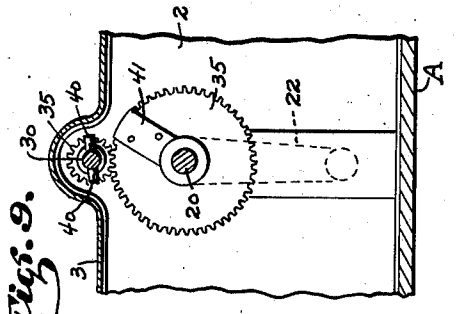

Fig. 9.

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UNITED STATES PATENT OFFICE

2,119,232

AUTOGRAPHIC REGISTER

Clarence L. Johnston, Oakland, Calif.

Application May 22, 1935, Serial No. 22,757

9 Claims. (Cl. 282—16)

This invention relates to an autographic register and stationery therefor.

There are several types of autographic registers in more or less common use but practically all registers require stationery containing a series of sequence of forms. Usually the stationery employed is referred to as a manifold pad or packet and consists of a series of superposed continuous sheets or strips of paper folded in a zigzag manner to form a packet. Each sheet or strip has a succession of forms printed thereon and each sheet is cut or perforated transversely between the forms to permit tearing and separation from the packet when the forms are filled in.

In actual operation the packet is inserted in an autographic register and the free ends of the superposed sheets forming the packet are advanced by manual or other feeding means over a writing table or platen where the printed form on the uppermost sheet is filled in by writing, typing, or otherwise, and duplicates thereof are simultaneously obtained on the underlying strips by interposed carbon sheets, or any suitable transfer medium, thus insuring a duplicate, a triplicate, or as many additional copies or records as desired.

After the filling in, the sheets are again advanced and the filled in forms are torn off to be mailed, filed, or otherwise disposed of. Experience has shown that where an original and duplicate forms are required, it is essential that the printed forms in the superposed sheets be maintained in register so that the written or typed matter applied to the uppermost or original form will appear on the same lines or spaces on the duplicates. To insure such registration when a packet of this character is used in an autographic register, feeding and registering devices to advance and register the printed forms are generally required. Such mechanism complicates the machine. Furthermore, it is usually necessary to provide form pads which, in addition to the perforated transverse lines, require two enlarged punched holes in each printed form which cooperate with the mechanism in the register to obtain registration of the printed superposed forms. The punched holes add to the cost of the packet; they require space which could otherwise be utilized for printed matter, and further the punched holes often tend to catch the edges of the interposed carbon sheets, thereby causing tearing of the same.

In practically all types of autographic registers a storage compartment is provided for the reception of the manifolding packet containing the forms to be filled in. In certain types of autographic registers there is, in addition to the storage compartment referred to, a second storage compartment which is provided for the reception of a record strip. Where a record strip is required, additional mechanism is necessary to separate the record strip from the original and the duplicates, for directing it into the second storage compartment, and for folding it back in to pad form, etc. In addition thereto, it is usually necessary to provide a manifolding pad with punched holes formed therein and offset with relation to the fold or tear lines, hence again adding cost, consuming space which could otherwise be used for printed matter, etc.

The present invention relates to an autographic register employing a secondary storage compartment for the reception of a record strip, the object of the invention being generally to improve and simplify the operation of autographic registers and the form of manifolding pad employed.

The invention, more specifically stated, embodies a friction feed for advancing the superposed manifolding strips, a registering mechanism, means for separating the record strip from the original and the duplicate strips, means for releasing the friction feed and for simultaneously engaging the strips to continue the feed and to bring the printed forms on the strips into register, means for reestablishing the friction feed after the registering operation, and stripper means for directing and controlling the folding operation of the record strip as it is being delivered to the secondary storage compartment.

The invention is shown by way of illustration in the accompanying drawings, in which—

Fig. 1 is a perspective view of the autographic register;

Fig. 2 is a perspective view of the manifolding packet employed;

Fig. 3 is a plan view of one of the strips forming the manifolding pad;

Fig. 4 is a central, vertical, longitudinal section of the autographic register;

Fig. 5 is a cross section on line V—V of Fig. 4;

Figs. 6, 7 and 8 are detail views showing the operation of the feeding and registering mechanism;

Fig. 9 is a detail view showing the gear drive between the friction feed rollers, said view also showing the mechanism whereby the friction feed is momentarily interrupted;

Fig. 10 is a view similar to Fig. 9, showing the

bearing supporting the upper shaft and feed rollers;

Fig. 11 is an enlarged cross section of the feed rolls, said view also showing the manner in which the original and duplicates are separated from the record strip and, furthermore, showing the form registering mechanism.

Referring to the drawings in detail, and particularly Figs. 1 to 5, A indicates a base member to which is secured a pair of side plates 2—2 which, together with the base, form a support for a removable cover member 3, having end sections 4 and 5 formed thereon, said cover plate, together with the side plates forming the case or housing of the autographic register, and said housing enclosing the operating mechanism whereby the autographic register is actuated.

Formed in the cover member 3 is a window or opening 6. Disposed below the same is a platen or table 7 over which the printed forms are advanced, said table being permanently secured between the side plates 2—2 of the case and being positioned a sufficient distance below the opening 6 to provide ample space for the superposed form or manifolding strips and a series of carbon sheets interposed between the same.

Secured substantially midway between the ends of the base are a pair of vertically positioned cross plates 8, whereby the interior of the housing or case is divided into two compartments 9 and 10, the compartment 9 being provided for the reception of a manifolding pad 9*a* having the printed forms to be filled in, and the compartment 10 for the reception of a record strip 10*a*.

The manifolding pad is of the type disclosed in my co-pending application Serial Number 993, entitled "Stationery for autographic registers", filed January 9th, 1935. This stationery, briefly stated, consists of a series of superposed sheets or strips of paper, such as indicated at C, D, and E, the uppermost strip being the original, the second strip D a duplicate, and the third or lowermost strip E a record strip. Each strip has identical or similar forms printed thereon and each strip is transversely perforated or weakened between the forms, as indicated at 12. The superposed sheets are folded in a zigzag manner, as shown in Fig. 2, to form a packet and this packet is placed in the bottom of the case and within the same as clearly shown at 9*a* in Fig. 4.

The free ends of the several sheets or strips are passed over a series of rollers, such as shown at 14, and then over the table 7 and they are interleaved during this operation with carbon sheets 15 supplied from the rollers 16, hence when the original or uppermost sheet is filled in carbon copies will be obtained on the duplicate and record strip.

When the printed forms have been placed in position on the table, it is necessary that registration of the several forms be insured so that written matter applied to the uppermost or original form will appear on the same lines or spaces on the duplicate and on the record strip, and so on. To accomplish this a pair of punched holes 17 are formed centrally of the perforated or weakened transverse tear lines. These holes are formed in each strip so that a pair of pins or lugs 18 may enter to continue feeding of the strips and to insure registration of the printed forms on the strips.

The mechanism whereby the strips are fed forwardly over the platen or table 7 embodies a shaft 20. This shaft extends crosswise of the machine and is journaled in bearings 21. One end of the shaft projects through the side plate 2, see Fig. 5, and is provided with a hand crank 22 whereby it may be rotated. Secured on the shaft 20 are a pair of feed rollers 23—23, the surfaces of which are knurled, or otherwise roughened, to provide a friction feed. Also secured on the shaft 20 between the feed rollers 23 is a pair of rollers 24. These rollers are spaced apart and a stripping arm 25 is placed between them. This arm is carried by a shaft 26 which extends through the rollers 24 and one of the rollers 23, said shaft being journaled in the rollers and having a crank arm 27 secured at the outer end. A spring is attached to the crank arm, as shown at 28, and this spring normally maintains the stripping arm in a retracted position between the rollers 24.

Mounted above the shaft 20 is a shaft 30. This shaft is supported in bearings 31 disposed on opposite sides of the case. These bearings are mounted in guideways 32, as clearly shown in Figs. 5 and 10, and a pull spring 33 is disposed below each bearing so as to maintain a pair of feed rollers 34 secured on shaft 30 in frictional engagement with the rollers 23—23. The strips, when placed between the rollers 23 and the cooperating rollers 34, will be fed in a forward direction when shaft 20 is rotated by means of hand crank 22, as shafts 20 and 30 are driven in unison through intermeshing gears as shown at 35 and 36. Means are, however, provided for interrupting the friction drive so as to permit registration of the printed forms in the strips and for re-establishing the friction drive the moment registration has been insured. This is accomplished as follows:

The gear ratio employed between the shafts 20 and 30 is three and one-half to one. With such a ratio a point or given mark on shaft 20 will register with a given mark on shaft 30 once during every two revolutions of shaft 20, or once during every seven revolutions of shaft 30. This condition is depended upon to accomplish three important functions. First that of momentarily releasing the friction feed; secondly, that of permitting registration of the printed forms on the sheets during the period of release; and third, that of actuating the stripper arm. The interruption of the friction feed is accomplished by placing a pair of pins 40 at opposite ends of the shaft 30 and by providing raising blocks 41 at each end of the shaft 20. These blocks engage the pins 40 once during each revolution of shaft 20 and thereby raise the shaft 30 vertically and upwardly away from shaft 20, thereby separating the gears 35 and 36 and the friction driving rolls 23 and 34. It is in this manner that the friction feed is momentarily interrupted. At this point a pair of lugs 18 secured to the outer face of the rollers 24 will enter the perforations or punched holes formed in the strips and if the forms happen to be slightly out of register, registration will be made as the lugs upon entering will continue the feed of the strips, or in other words, pull them in a forward direction over the table, thereby insuring registration and the moment registration has been completed the friction feed is again established as the blocks 41 will move out of register with the pins 40.

The stripper arm 25 is actuated once during every two revolutions of shaft 20, or once during every seven revolutions of shaft 30. A pin 45 is secured to shaft 30. This engages the outer end of the crank arm 27 once during every two

revolutions of shaft **20**, as shown in Fig. 6, thereby rocking the shaft upon which the crank arm, together with the stripper arm **25**, is secured, causing the stripper arm to move outwardly between the rolls and to force the record strip outwardly away from and free of the registering lugs **18**, as will hereinafter be described.

In actual operation the manifolding pad or packet will be placed in the compartment **9**, as indicated at **9a**. The free ends of the packet will be passed around the rolls, as previously described, then over the table **7** and the carbon sheets will at the same time be interleaved therewith. The forward ends of the sheets are then passed between the feed rolls **23** and **34** and the perforations formed centrally thereof passed over the registering lugs so that the printed forms exposed through the window or openings **6** will be in register. The forms are then filled in by writing, typing, or otherwise, and when this operation is completed it will be necessary to remove the filled in forms to make way for a new set of forms.

The removal of the filled in forms is accomplished by directing the uppermost strips over a separating lip indicated at **50**, see Fig. 11. The lowermost strip or record strip will be directed under the lip and, in fact, will be held by the registering lugs. The crank **22** is grasped and rotated and shafts **20** and **30** will, accordingly, be rotated as gears **35** and **36** are normally in mesh. When the filled in forms have been substantially removed, or in other words, when the second set of forms have almost reached position the friction feed will be released by engagement of the pins **40** with the lifting blocks **41**. At this moment the registering lugs will enter the perforations between the forms and, as shafts **20** and **30** continue to rotate due to rotation by means of crank **22**, the strips will continue feeding forward and they will at the same time be brought into register. At the moment registration has been obtained pins **40** will move out of engagement with the lifting blocks **41** and shaft **30** will be pulled back by means of the springs **33** so that frictional engagement is again had with the knurled surfaces of the feeding rolls **23** and **34**. This re-establishment of the friction feed is obtained at the moment when the filled in forms are completely removed and when the next or adjacent set of forms have reached proper position for filling in. The hand crank is then released, the uppermost strips have been directed outwardly from the machine by the lip **50** and torn off and may be mailed, filed, or otherwise disposed of. The record strip on the other hand is directed below the lip **50** into the compartment **10** and it is here automatically refolded by the stripper arm **25** and a second set of stripper arms indicated at **53**, these stripper arms being two in number and being disposed between the feed rolls **23** and the rollers **24**.

The stripping arm **25**, as previously stated, operates only once during every two revolutions of shaft **20**. During the revolution that the stripper arm is idle the registering lugs will carry the record strip around to the point shown in Fig. 8, where the record strip will be stripped off by the stripper arms **53**. In this manner one printed form of the record strip will be directed to the rear of the compartment **10**. During the next revolution the stripper arm **25** will be actuated and the next section of the record strip will be stripped off the lugs **18** as shown in Fig. 6, and will be directed forwardly in the compartment **10**. Hence, the registering lugs serve three functions: first that of insuring registration; secondly, that of feeding while the feeding rolls are out of operation; and third, that of actuating the stripper whereby the re-folding of the record strip in compartment **10** is accomplished.

From the foregoing it should be obvious that a very simple form of manifolding pad may be employed; that register between the printed forms is insured; that separation of the record strip from the original and duplicates is readily accomplished; that the record strip is re-folded in the compartment **10**, and that the several operations are accomplished by an exceedingly simple and efficient form of mechanism.

While these and other features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims. Similarly, that the materials and finish of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

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

1. In a machine for controlling advance of a plurality of superposed record strips, including a filing strip for manifold inscription, said strips having printed forms thereon with tear lines between the forms, a housing divided into two compartments, one for the reception of the superimposed record strips and one for the reception of the filing strip, upper and lower rollers for frictionally engaging the advancing superimposed strips, said strips having openings formed therein on the tear lines for registering the strips and for holding the filing strip, means for separating the feeding rolls at a point during the travel of the strips, a pair of fixed fingers cooperating with the lower feed rolls, said fingers entering the openings in the strips to complete the feeding operation and register the strips during separation of the feed rolls and continuing in engagement with the record strip to positively feed the record strip into the front and rear portions of the compartment therefor, and means automatically acting during alternate feeding movement of the strips to release the record strip from said fingers into the front and rear portions of its compartment.

2. In a machine for controlling advance of a plurality of superposed record strips, including a filing strip for manifold inscription, said strips having printed forms thereon with tear lines between the forms, a housing divided into two compartments, one for the reception of the superimposed record strips and one for the reception of the filing strip, a table within the housing, upper and lower rollers for frictionally engaging the advancing superimposed strips over the table where they are written upon, said strips having openings formed therein on the tear lines for registering the strips and for folding the filing strip, means for separting the feed rollers to momentarily interrupt the feed when the strips have substantially reached position on the table, a pair of fixed fingers cooperating with the lower feed rollers, said fingers entering the openings in the strips to complete the feeding operation and register the strips during the momentary separation of the feed rollers, and continuing in engagement with the record strip to positively feed the record strip into the front and rear portions of its compartment, and means automatically acting during alternate feeding

movements of the strips, to release the record strip from said fingers in the front and rear portions of its compartment.

3. In a machine for controlling advance of a plurality of superposed record strips, including a filing strip for manifold inscription, said strips having printed forms thereon with tear lines between the forms, a housing divided into two compartments, one for the reception of the superimposed record strips and one for the reception of the filing strip, a table within the housing, upper and lower rollers for frictionally engaging the advancing superimposed strips over the table where they are written upon, said strips having openings formed therein on the tear lines for registering the strips and for folding the filing strip, means for separating the feed rollers to momentarily interrupt the feed when the strips have substantially reached position on the table, a pair of fixed fingers cooperating with the lower feed rollers, said fingers entering the openings in the strips to complete the feeding operation and to register the strips during the momentary separation of the feed rollers, means for separating the strips and directing the filing strip into the filing compartment, said means also directing the superposed strips out of the housing so that they may be torn off at the tear lines and removed, said fingers projecting through the perforations in the filing strip after the superposed strips have been torn off and positively feeding the filing strip down into the filing compartment during the commencement of each feeding operation, means automatically acting during one feeding operation for releasing the filing strip from said fingers into the forward portion of the said compartment, and means automatically acting during the next successive feeding operation for releasing the filing strip from the fingers into the rear portion of said compartment.

4. In a machine for controlling advance of a plurality of superposed record strips, including a filing strip for manifold inscription, said strips having printed forms thereon with tear lines between the forms, a housing divided into two compartments, one for the reception of the superposed record strips and one for the reception of the filing strip, a table within the housing, upper and lower rollers for frictionally engaging the advancing superposed strips over the table where they are written upon, said strips having openings formed therein on the tear lines for registering the strips and for folding the filing strip, means for separating the feed rollers to momentarily interrupt the feed when the strips have substantially reached position on the table, a pair of fixed fingers cooperating with the lower feed rollers, said fingers entering the openings in the strips to complete the feeding operation and to register the strips during the momentary separation of the feed rollers, means for directing the filing strip into the filing compartment, said means also directing the superposed strips out of the housing so that they may be torn off at the tear lines and removed, said fingers projecting through the perforations in the filing strip after the superposed strips have been torn off and pulling the filing strip down into the filing compartment during the commencement of each feeding operation, and automatic means for stripping the filing strip from said fingers at different positions within the filing compartment to cause folding of the filing strip.

5. In a machine for controlling advance of a plurality of superposed record strips, including a filing strip for manifold inscription, said strips having printed forms thereon with tear lines between the forms, a housing divided into two compartments, one for the reception of the superposed record strips and one for the reception of the filing strip, upper and lower rollers for frictionally engaging the advancing superposed strips over a table where they are written upon, said strips having openings formed therein on the tear lines for registering the strips and for folding the filing strip, means for separating the feed rollers to momentarily interrupt the feed when the strips have substantially reached position on the table, a pair of fixed fingers cooperating with the lower feed rollers, said fingers entering the openings in the strips to complete the feeding operation and to register the strips during the momentary separation of the feed rollers, means for directing the filing strip into the filing compartment, said means also directing the superposed strips out of the housing so that they may be torn off at the tear lines and removed, said fingers projecting through the perforations in the filing strip after the superposed strips have been torn off and pulling the filing strip down into the filing compartment during the commencement of each feeding operation, and automatic means for stripping the filing strip from said fingers at different positions within the filing compartment to cause folding of the filing strip, said stripping operations taking place just after the fingers have entered the filing compartment during one feeding operation and just before leaving the filing compartment during the next feeding operation, said stripping operations alternating for each feeding operation.

6. In an autographic register containing a plurality of superposed strips folded to form a zigzag pad with a succession of printed forms on each strip and with tear lines and preforations on said lines between the printed forms, a casing having a storage compartment therein, a table in the casing, upper and lower feed rollers for advancing said strips over the table, means for registering the forms and for directing the lowermost of said strips to a storage compartment within the casing, said means comprising a pair of fixed pins in connection with the lower feed roller adapted to enter the perforations between the forms to cause registration of the printed forms and to feed and direct the lowermost strip into the compartment, a stripper arm moving with the lower feed roller and means actuating said stripper arm once during every second revolution of the lower feed roller, said stripper arm when actuated raising the strip away from the said pins to free the record strip with relation thereto and a second stripper arm engaging the record strip and freeing it with relation to the pins during alternate revolutions of the lower feed roller when the first stripper arm is inactive, said stripper arms together forming stripping means directing the record strip forwardly and rearwardly in the storage compartment and causing folding of it into a zigzag pad form.

7. In an autographic register, a casing having therein a record strip storage space, a writing table within the casing forming a support for a plurality of superposed strips having a succession of printed forms thereon, each strip having tear lines between the forms, said strips comprising an original, a duplicate and a record strip, and each strip having perforations formed therein substantially on each tear line thereof, upper and

lower feeding rollers for frictionally advancing the strips over said table, means for momentarily interrupting and then re-establishing the friction feed during the feeding of each set of forms, means moving with the lower feeding rollers to engage the strips for feeding the latter during the interrupted period and for bringing the forms into registration, said means being subsequently disengaged from the original and duplicate strips and remaining in engagement with the record strip, means for separating the record strip from the original and duplicate strips and for directing the record strip into the said storage space, record strip releasing means including strippers cooperating with said strip engaging and registering means, one of said strippers acting during every second revolution of the lower feed rollers to release the record strip into the rear portion of the storage space, and means for actuating the other stripper during every alternate second revolution of the lower feeding rollers to release the record strip into the forward portion of the storage space, to thus provide for the folding of the record strip.

8. In an autographic register, a casing having therein a record strip storage space, a writing table within the casing forming a support for a plurality of superposed strips, said strips having a succession of forms printed thereon and having tear lines between the forms, said strips comprising an original, a duplicate and a record strip, each strip having perforations formed therein substantially on the tear lines, an upper and a lower shaft extending crosswise of the casing, friction feeding rollers secured on the respective shafts and engageable with the strips to advance them over the table, means carried by the said shafts for elevating the upper shaft momentarily during the feeding operation of a set of forms to interrupt the feed, a pair of prongs carried by the lower shaft adapted to enter the perforations between the forms when the friction feed is interrupted and to continue the feeding of the forms during the interrupted period, said prongs remaining in the perforations of the record strip after the friction feed has been restored, and after original and duplicate forms have been detached, to positively feed the record strip into the storage space, and stripping means including strippers, one of which strippers acts during every second revolution of the lower feed rollers to release the record strip into the rear portion of the storage space, and means for actuating the other stripper during every alternate second revolution of the lower feed rollers to release the record strip into the forward portion of the storage space, to thus provide for the folding of the record strip.

9. In an autographic register, a casing having therein a record strip storage space, a writing table within the casing forming a support for a plurality of superimposed strips having a succession of printed forms thereon and register perforations, said strips comprising an original and a record strip, upper and lower feeding rollers for frictionally advancing the strips over said table, means for momentarily interrupting and then re-establishing the friction feed during the feeding of each set of forms, means moving with the lower feeding rollers to engage the perforations in the strips for feeding the latter during the interrupted period and for bringing the forms into registration, said means being subsequently disengaged from the original strip and remaining in engagement with the record strip, means for separating the record strip from the original strip and for directing the record strip into the storage space, record strip releasing means including strippers cooperating with said strip engaging and registering means, one of said strippers acting during every second revolution of the lower feed rollers to release the record strip into the rear portion of the storage space, and means for actuating the other stripper during every alternate second revolution of the lower feed rollers to release the record strip into the forward portion of the storage space, to thus provide for the folding of the record strip.

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