

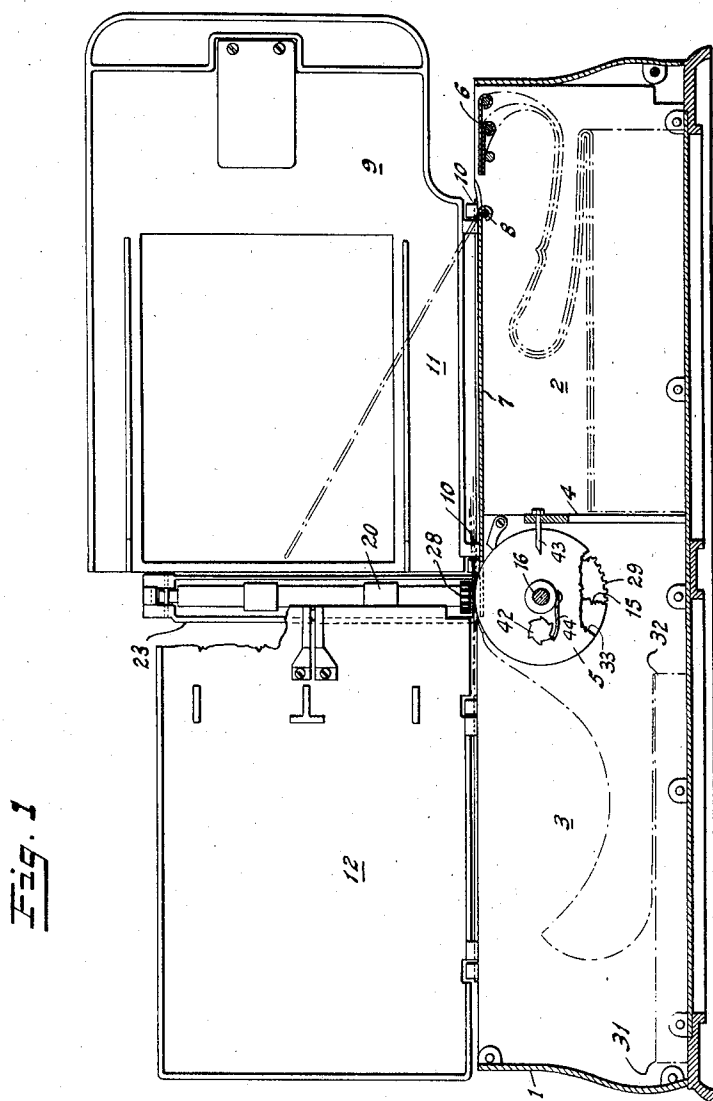
Jan. 8, 1929.

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L. F. HAGEMANN

POSITIVE FOLDING ATTACHMENT

Original Filed Jan. 17, 1925 3 Sheets-Sheet 1



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BY
Duell, Anderson & Duell ATTORNEYS

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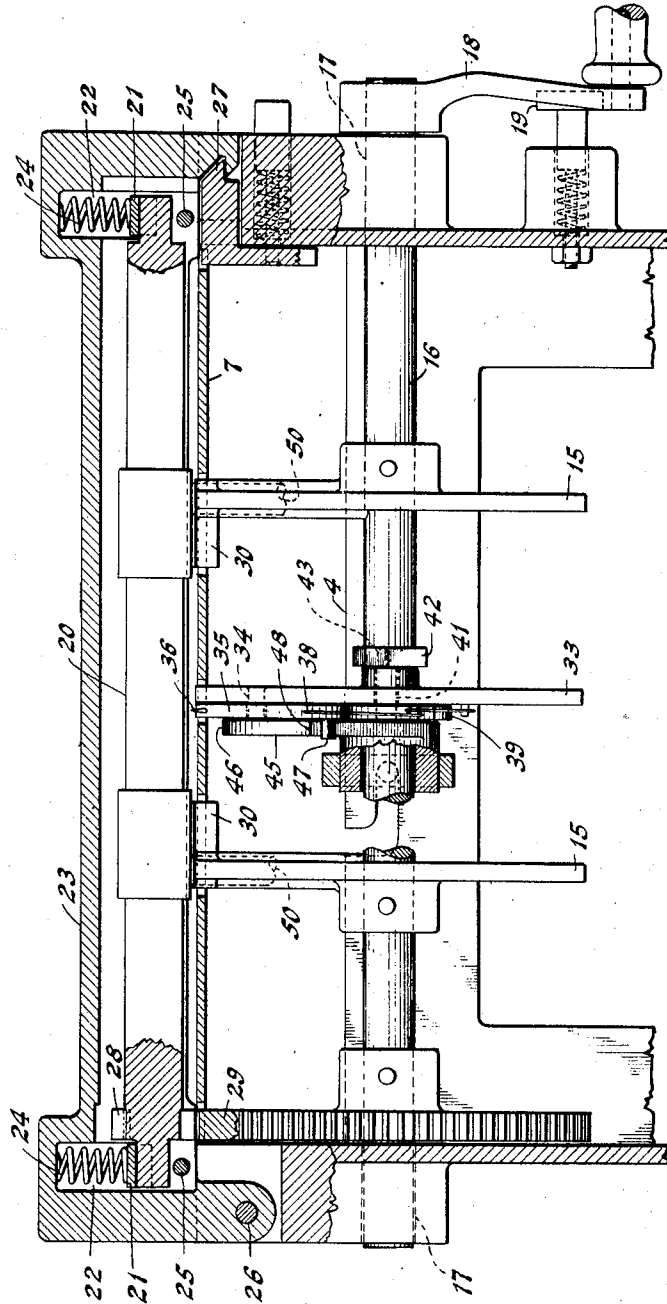
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3 Sheets-Sheet 2

Fig. 2



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Fig. 3

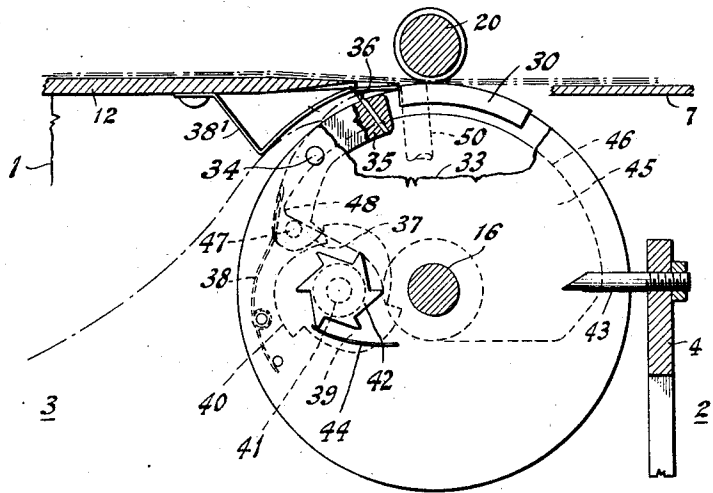
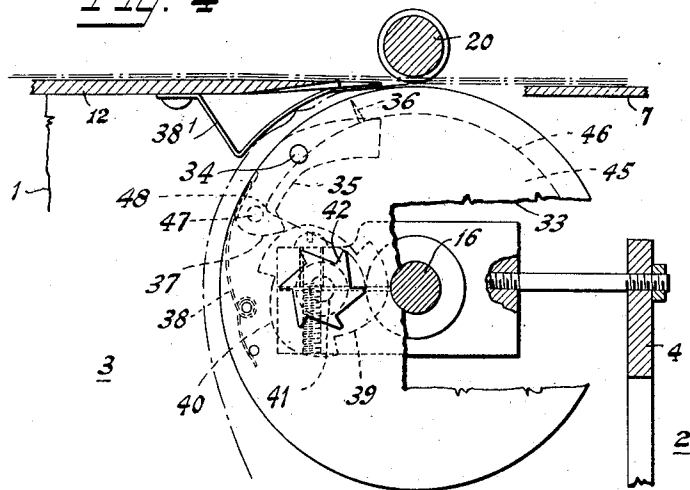


Fig. 4



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UNITED STATES PATENT OFFICE.

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POSITIVE FOLDING ATTACHMENT.

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This invention relates to improvements in apparatus for making manifold records and, with respect to its more specific features, to the feeding and directing of the record strips in autographic registers in which the record strips are simultaneously advanced from a supply into relative superposed position for inscription.

One of the objects of the invention is the provision of an apparatus of the character referred to wherewith the folding of a strip in the chamber may be accomplished without the necessity of preliminarily modifying the strip for engagement with the folding device. Another object is the provision of a practical device adapted positively to engage the strip at whatever point the strip may be presented thereto and fold and otherwise direct the strip in a predetermined manner without impairing the strip and without defacing the record on the strip.

Another object is to provide a simple and practical device for accomplishing the above objects while maintaining the form-registering devices in efficient operative condition.

A further object is to provide means adapted to be associated with the feeding means for engaging with certain selected record sheets to present those record strips preferably in a record compartment in a manner different from other record strips, and in its more specific application when used with record sheets attached together to form a continuous strip to present alternate record strips in reverse due direction to fold the strip zigzag.

Other objects will appear in part obvious and will in part appear hereinafter.

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

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a longitudinal section of a machine embodying this invention having the covers raised and a paper record strip indicated in dotted line;

Fig. 2 is a fragmental vertical cross-section along the line 2—2 of Fig. 1 showing the details of the feeding and selecting mechanism;

Fig. 3 is an enlarged detail of the feeding and selecting mechanism while the strip gripping mechanism is engaging the strip; and

Fig. 4 is a view similar to Fig. 3 at a time when the gripping mechanism does not grip the strip.

It has heretofore been proposed to construct autographic registers for use with strips of record leaves, one of which is carried into a receiving chamber in which it is desired to fold it zigzag to form a flat package for record purposes. With such machines, however, difficulty has been experienced in insuring that the sheet fed into the compartment will fold flat.

It has further been proposed so to position the location of the refolded pad that the sheets normally tend to enter the record compartment in the direction of one of the folds and to provide mechanism for definitely engaging the alternate record sheets to reverse their direction for insuring the location of each other fold.

In accordance with that construction, certain of the record sheets are modified and the mechanism is arranged so that it will respond only to the modified sheets.

In accordance with the present invention, it has been found possible to utilize a strip engaging mechanism which is adapted to grip the strip at any point with which it may come into contact and to secure the proper selecting action by timing the operation of the gripping means relative to the operation of the feed.

A desirable type of machine with which this improvement may be used comprises one in which the supply pad is in the form of a plurality of strips interfolded zigzag and provided with feed control apertures; while the feeding means is responsive to the apertures to control the length of strip fed by engagement with an aperture. This invention is accordingly illustrated as applied to a machine of that type commonly called the disc feed type.

Referring now more specifically to the drawing:

The numeral 1 designates a casing divided in general into two compartments 2 and 3, as by a partition 4. The compartment 2 is adapted to receive a supply pad of record strips or webs interfolded zigzag to form superposed sets of superposed record leaves, while the other compartment 3 is intended

to receive one of the strips as a permanent record refolded in zigzag manner. Interposed between the compartments 2 and 3 is a feeding means designated generally by the numeral 5. Suitable means are provided as shown at 6 for separating the strips and guiding them over a tablet 7 pivoted as at 8 above the compartment 2, and a margin frame 9 is pivotally supported at one side as 10 of the casing to cover the tablet. The casing may be provided with the usual receptacle at the side of the tablet for the reception of a roll of transfer material which receptacle may be adapted to be closed by the extension 11 at the side of the margin frame 9.

A cover or top 12 may be provided for the compartment 3 which cover may extend to a point adjacent to the feeding means and be adapted to separate the lowermost strip which is to be diverted into the compartment 3 from those strips which are to be delivered from the machine. The feeding mechanism comprises in general a pair of discs 15 mounted upon a shaft 16 journaled at 17 in the sides of the casing. There is a handle 18 upon the shaft 16 for the purpose of turning the shaft while a spring stop 19 mounted on the side of the casing is in position to stop the handle 18 at the completion of a revolution.

Co-operating with the discs 15 is a roller 20 which is shown in rear of the top 12 and pivoted in blocks 21 sliding in grooves 22 in the cross bar 23. A spring 24 within the groove urges the blocks 21 downwardly while a pin 25 limits the downward movement. The cross-bar 23 is pivoted on one side as at 26 and held by a spring catch 27 upon the other side. The stop 25 is so adjusted that the springs 24 will, during the normal operation of the machine, urge the roll 20 toward the discs 15 to grip the paper strips between them and cooperating pinion and gear 28 and 29 are adapted to drive the roller 20 with the same peripheral speed as the discs 15.

The machine illustrated is adapted for use with strips of record sheets having lines of control apertures in definite relation to the sheets and the discs 15 are in longitudinal alignment with the control apertures. With such a construction, the discs and the roller 20 will grip the strips to feed them forward until the control apertures come opposite the discs whereupon the feed will stop. The relation of the control apertures and the record sheets is such that the record sheets will be in registry with the writing tablet at the completion of the feed. Auxiliary lugs 30 are provided to grip the strips beside the apertures to commence the feeding movement.

The compartment 3 is so positioned relative to the feeding mechanism that a sheet fed beneath the cover 12 will normally extend and be directed toward the far end 31

of the compartment and means are provided in connection with the feeding mechanism for engaging every alternate sheet to direct it to the near end 32 of the compartment.

As illustrated, there is provided upon the shaft 16 a third disc 33 on which is pivoted near its periphery as at 34 an arm 35 carrying at one end a pin 36 and at the other a cam surface 37. The arm 35 is mounted upon the stud 34 for oscillatory movement through an arc sufficient to cause the pin 36 to project beyond the periphery of the disc 33 and to be retracted completely below the disc surface, and a spring 38 is arranged to project the pin unless the arm be otherwise restrained.

A guide 38' is provided upon the underface of the cover 12 and this guide has a central slot through which the pin 36 may project. Thus the guide 38' furnishes a support for the strip so that when the pin 36 is projected, the strip will be held in place for the pin to pierce it.

Also mounted upon the disc 33 is a rotary cam 39 having one or more cam faces 40 in position to engage the cam surface or trigger 37. This cam 39 is mounted for rotation about a pin 41 and carries with it a star wheel 42. An arm or tooth 43 is supported by the casing in position to engage the star wheel 42 and move it one notch for each revolution of the disc 33 and a spring 44 bearing upon the surface of the disc is adapted to hold the star wheel in any position to which it may have been moved.

The mating cam surfaces 37 and 40 are so positioned relative to the star wheel that as the star wheel is moved step by step by the arm 43, the pin 36 is positively retracted by the cam below the surface of the disc on one revolution and released to be projected upon the next revolution, alternating with each revolution.

In accordance with the construction outlined, it will be clear that the pin 36 will be released for projection when the arm 43 encounters the star wheel. In order, therefore, to delay projection of the pin until the position illustrated in Fig. 3 has been reached, a cam 45 is provided having a substantially concentric cam surface 46 and a pin 47 upon the arm 35 projects into the pathway of the cam surface 46 and the relation of these parts is such that so long as the pin 47 is in engagement with the cam surface 46, the pin 36 is held retracted, but as soon as the pin has passed over the heel 48 of the cam 46 substantially in the position as shown in Fig. 3, the spring 38 may project the pin, provided it is not restrained by the cam 40. The relation of the supporting lug 30 and the pin 36 may be adjusted relative to each other by adjusting the position of the disc 33 upon the shaft 16. It is preferable, therefore, to so arrange the pin and lug that the pin will be

in registry with and project through the beginning of the coming record sheet rather than the end of the previous one.

If the strip used with the machine is biased so as to refold more readily in the same direction that it was previously folded, it may be preferable under some circumstances so to time the pin 36 with the strip that the pin will be projected only into those strips which would normally tend to fold downwardly toward the end 32 of the compartment 3. It has been found possible, however, so to weaken the fold line between successive record sheets that there is little or no biasing of the direction of fold, that is, so that the fold line will fold substantially as easily in one direction as in the other. Such a strip may be used with a machine without being timed relative to the projection of the pins.

The operation of the machine is as follows:

The web supply is placed in a compartment 2 and the strips are carried past the separators 6 over the tablet 7 to the feed mechanism, with the transfer sheets interleaved between them. The strip supply, if it have control apertures in it, may have the control apertures brought into registry with pre-aligning pins 50 upon the feed disc and the lowermost web may be carried below the guide 38' and the upper webs above the cover 12. Thereupon the cross-bar 23 may be put in place and the margin frame 9 closed. The machine is now ready for inscription.

After inscription, to bring a new record sheet into position, the catch 19 may be depressed with the thumb and the handle 18 turned, whereupon the lugs 30 engaging the strips, feed the strips forward until the apertures are past the discs 15 whereupon the feeding is continued by the discs 15 until the next successive control aperture is reached whereupon it ceases because of the failure of the discs to engage the strips.

Assuming that the star wheel and cam are in the position shown in Fig. 3 just after the beginning of the feeding movement, the pin 36 will be projected through the forward end of the record sheet as soon as the pin 47 has passed over the heel 48 of the cam 46, and this pin will grip the forward end of the sheet at a point beyond where it first separates from the other strips and carry it downwardly substantially to its position at the end 32 of the record pad. Thereupon the engagement of the pin 43 with the star wheel will positively retract the pin and allow the forward end of the record sheet to drop into place. This sheet is now in position with its forward end in position and its rearward portion bowed outwardly around the feeding mechanism. As the feed continues the strip bows more and more.

Upon the next succeeding feeding movement, the cam 40 having been turned as de-

scribed to the point of positively retracting the pin, it is held retracted by the cam 40 during the beginning of the next revolution and hence, when the next succeeding sheet is fed, its forward end will not be gripped by the pin. Thus the bowed portion of the sheet will continue to enlarge until the next fold line is definitely in place at the far end 31 of the record pad.

Thus it will be seen that the one fold line is put in place at the far end of the pad by the direction of feed of the machine, while the next fold line is drawn into place by the pin 36, and thus the sheet is refolded in zigzag form in the supply pad, the pin 36 engaging behind each alternate fold line.

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 drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statement of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. An autographic register adapted for use with a multiple strip web supply, one of which strips is provided with regularly spaced fold lines, comprising, in combination, means for feeding said strips simultaneously, a record compartment, means situated beyond said feeding means for separating one of said strips from the others and diverting said separated strip into said record compartment, means for refolding said separated strip within said record compartment, including a pin, and means for projecting said pin to puncture said strip at a point beyond said separation.

2. An autographic register adapted for use with a multiple strip web supply, one of which strips is provided with regularly spaced fold lines, comprising, in combination, means for feeding said strips simultaneously, a record compartment, means situated beyond said feeding means for separating one of said strips from the others, and directing said separated strip toward the far end of said record compartment, means for refolding said separated strip within said record compartment, including a pin, means for projecting said pin to puncture said strip at a point beyond said separation, means to move said pin toward the near end of said record compartment, and means for timing the projection of said pin to cause it to

puncture said strip immediately behind each alternate fold line.

3. In an apparatus of the character described, in combination, strip feeding mechanism, a chamber into which the strip is delivered by said feeding mechanism, means adapted to fold said strip in a zig-zag manner in said chamber comprising a pin carrier movable in an endless path, longitudinally of the strip, and a strip-puncturing pin movable with said carrier and oscillatable into and out of puncturing engagement with said strip at predetermined points in said endless path.

4. In an apparatus of the character described, in combination, strip feeding mechanism, a chamber into which the strip is delivered by said feeding mechanism, means adapted to fold said strip in a zig-zag manner in said chamber, comprising a pin carrier movable in an endless path, longitudinally of the strip and a strip-puncturing pin movable with said carrier and oscillatable into and out of puncturing engagement with said strip at predetermined points in said endless path, a removable top for said chamber, and a strip-support on said top adapted to guide said strip into a plane normal to the thrust of said pin.

5. In an apparatus of the character described, in combination, strip feeding mechanism, a movable carrier, a strip-puncturing strip-directing pin movable with said carrier and reciprocal thereon for engaging and disengaging the passing strip, a spring adapted to cause movement of the pin in its reciprocal path to engage the strip, and means adapted at intervals in the movement of said carrier to stress said spring for causing strip-engaging movement of said pin.

6. In an apparatus of the character described, in combination, a pair of friction feed rolls adapted to advance a strip, and means adapted to direct the strip coming from said rolls comprising a pin-carrier rotative longitudinally of the strip, a strip-directing pin rotative with said carrier and adapted to oscillate on said carrier into and out of engagement with said strip, a spring adapted to cause said pin to pierce said strip, means, adapted by rotation of said carrier, on alternate revolutions to set said pin under operative stress of said spring and release said pin for strip engaging movement under influence of said spring, and means including a stationary track with which said pin contacts at intervals, adapted to control the point in the rotary path of said carrier at which said release takes effect.

7. In an apparatus of the character described, in combination, a pair of friction feed rolls adapted to advance a strip, and means adapted to direct the strip coming from said rolls comprising a pin-carrier rotative longitudinally of the strip, a strip-directing

pin rotative with said carrier and adapted to oscillate on said carrier into and out of engagement with said strip, a spring adapted to thrust said pin into engagement with said strip, means, adapted by rotation of said carrier, on alternate revolutions to set said pin under operative stress of said spring, and release said pin for strip engaging movement under influence of said spring, including a trigger rotative with said carrier and progressively movable relative thereto, and a tooth adapted progressively to move said trigger.

8. In an apparatus of the character described, in combination, a pair of friction feed rolls adapted to advance a strip, and means adapted to direct the strip coming from said rolls comprising a pin-carrier rotative longitudinally of the strip, a strip-directing pin rotative with said carrier and adapted to oscillate on said carrier into and out of engagement with said strip, a spring adapted to thrust said pin into engagement with said strip, means, adapted by rotation of said carrier, alternately to set said pin under operative stress of said spring and release said pin for strip engaging movement under influence of said spring, including a trigger rotatably mounted on said carrier and having alternate cams and abrupt shoulders and a pawl and ratchet for rotating said trigger.

9. In an apparatus of the character described, in combination, a pair of friction feed rolls adapted to advance a strip, and means adapted to direct the strip coming from said rolls comprising a pin-carrier rotative longitudinally of the strip, a strip-directing pin rotative with said carrier and adapted to oscillate on said carrier into and out of engagement with said strip, a spring adapted to thrust said pin into engagement with said strip, means, adapted by rotation of said carrier, alternately to set said pin under operative stress of said spring and release said pin for strip engaging movement under influence of said spring, including a trigger rotatably mounted on said carrier and having alternate cams and abrupt shoulders, a ratchet operatively affixed to said trigger and a stationary tooth adapted to be engaged at intervals by said ratchet as said carrier rotates.

10. In an apparatus of the character described, in combination, means adapted to advance a strip at intervals, a strip-puncturing pin adapted to direct the strip coming from said rolls, a pin carrier rotative longitudinally of the strip and on which said pin is pivoted for oscillation into and out of puncturing-engagement with the strip, a trigger rotatably mounted on said carrier adapted to move said pin on its pivoted axis thereby on alternate revolutions to set said pin under operative stress of said spring and to release said pin for strip-engaging movement under influence of said spring, means whereby actuation of said strip advancing means rotates

said carrier and rotates said trigger on said carrier.

11. In an apparatus of the character described, in combination, means adapted to advance a strip at intervals, a strip-puncturing pin adapted to direct the strip coming from said rolls, a pin carrier rotative longitudinally of the strip and on which said pin is pivoted for oscillation into and out of puncturing-engagement with the strip, a trigger rotatably mounted on said carrier adapted alternately to move said pin on its pivotal axis to thereby set said pin under operative stress of said spring and to release said pin for strip-engaging movement under influence of said spring, means whereby actuation of said strip advancing means rotates said carrier and rotates said trigger on said carrier, and a stationary member adapted to hold said pin from movement to strip engaging position, when released, in alternate intervals of rotation of said carrier.

12. In an apparatus of the character described, having a cooperative pair of friction feed rolls adapted to advance a strip having a longitudinal series of form-registering apertures, one of said rolls adapted to enter said apertures and thereby cause arrest of advance of the strip and permit form registering movement thereof relative to said rolls, in combination a carrier rotative longitudinally of the strip, a sharp strip-feeding pin rotatable with said carrier pivoted thereon for movement to engage the strip, a spring on said carrier adapted to thrust said pin through an imperforate portion of said strip at intervals of the rotation of said carrier and means adapted to stress said spring for actuating said pin whereby as said pin is actuated and carried by said carrier it flexes the strip around the feed rolls and carrier.

In testimony whereof I affix my signature.

LOUIS FRED HAGEMANN.