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TEAR-OFF BAR FOR AUTOGRAPHIC REGISTERS

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2 Sheets-Sheet 1

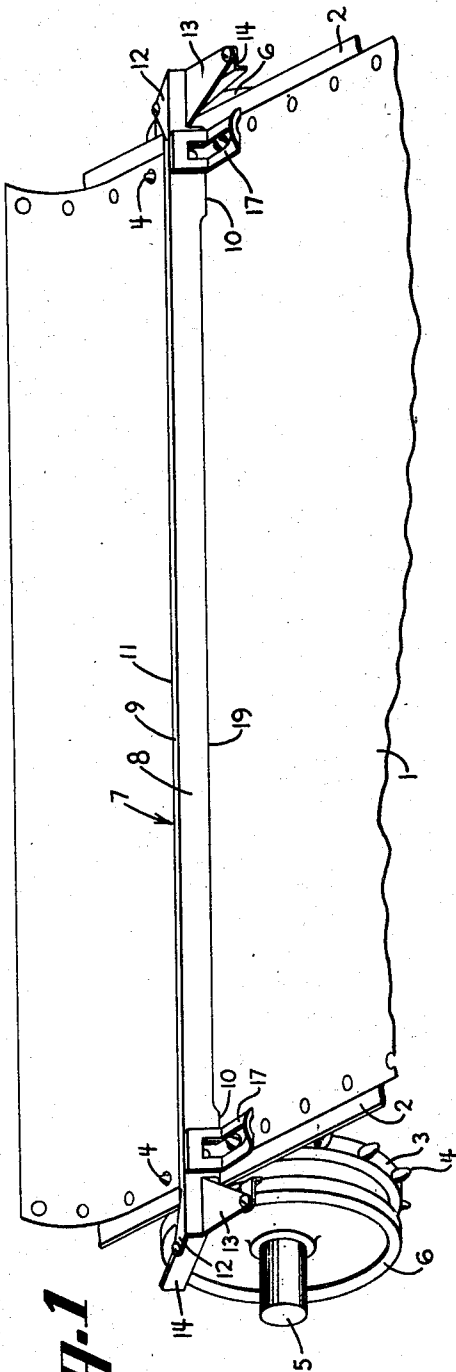


Fig. 1

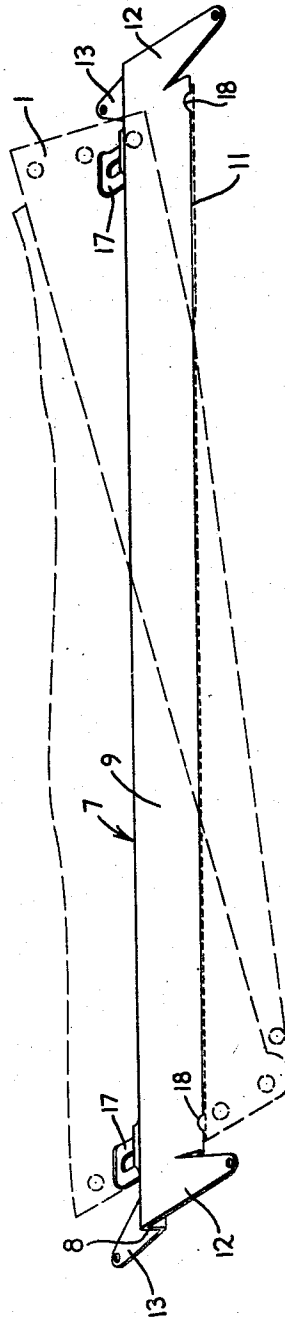


Fig. 2

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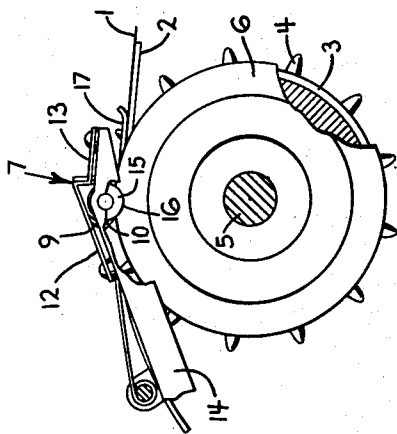


Fig. 4

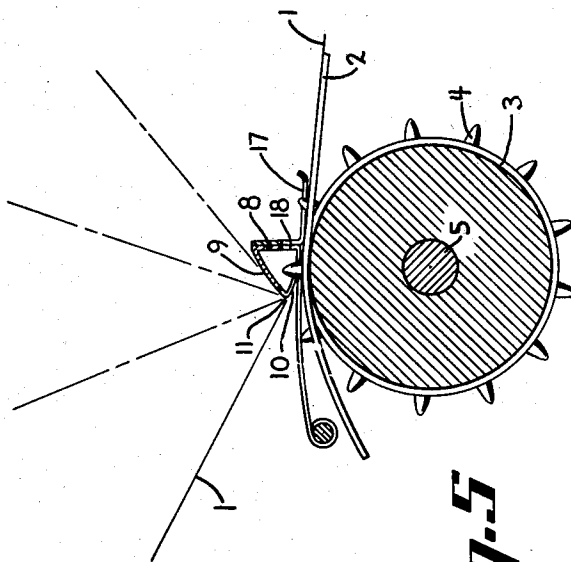


Fig. 5

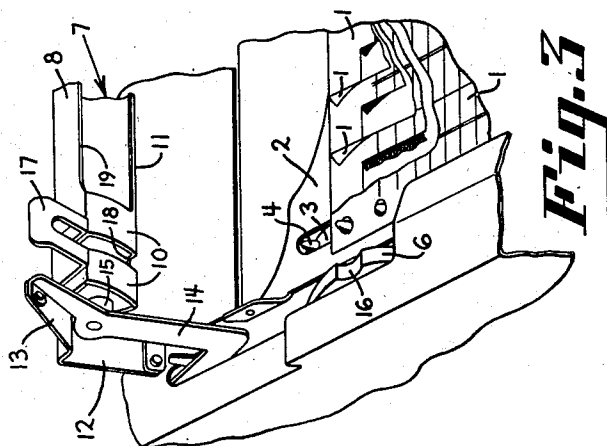


Fig. 6

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TEAR-OFF BAR FOR AUTOGRAPHIC REGISTERS

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8 Claims. (Cl. 164—84.5)

This invention relates to autographic registers, and more particularly to a multi-purpose tear-off bar which functions not only as a universal tear-off bar, but also as a hold-down bar, feed-roll guide and web pressure finger.

Heretofore the tear-off knives or bars used in autographic registers have not always been satisfactory in use, mutilated forms quite frequently resulting from their use. Not only has it been necessary to tear an ejected form in only one position, but if more than one form was to be separated from the strip of superposed forms, the underlying form often was not torn on the proper line.

The former tear-off bars have not provided sufficient pressure upon the assembly of superposed forms to permit tearing of the ejected form in any position but straight up without tearing the succeeding form from its engagement with the usual pin type feeding mechanism.

Thus, the object of the present invention is to simplify the construction as well as the means and mode of operation of tear-off bars as disclosed herein, whereby such mechanism may not only be economically manufactured, but will be more efficient and accurate in use, adaptable to a wide variety of tearing angles, having relatively few parts and be unlikely to get out of repair.

A further object of the invention is to provide a multi-purpose unit, which not only functions as a tear-off bar, but also as an efficient hold-down bar, feed-roll guide and web pressure finger combined.

A further object of the invention is to provide in a tear-off bar a rounded surface against which the record is engaged for severing.

A further object of the invention is to provide a tear-off bar having a receding upper surface so that it will permit tearing of the record strip in a backwards direction.

A further object of the invention is to provide as an integral part of the tear-off bar a pair of pressure fingers which materially assist in proper feeding of the record strips and when lowered assist the resistance offered by the tear-off bar to movement of the record strips during the tearing operation.

A further object of the invention is to provide a machine possessing the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein mentioned.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation, as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

In carrying out the present invention, there is contemplated a single unitary member which functions as a tear-off bar, a hold-down bar, and additionally provides the advantageous pressure fingers, the bar being so shaped that a record strip may be torn at many angles, the separation of the ejected record form being accomplished by a bursting of the record strip at the desired point rather than by a shearing or cutting thereof.

Referring to the accompanying drawings, wherein is found the preferred but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a fragmentary perspective view of the feeding area of an autographic register, looking toward the front

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of the register, showing the present multi-purpose tear-off bar in place.

Fig. 2 is a perspective view of the tear-off bar, removed from the register, showing the opposite side from that shown in Fig. 1.

Fig. 3 is a fragmentary view showing the tear-off bar in elevated position above the feeding area of the register.

Fig. 4 is an end view showing the tear-off bar in lowered home position.

Fig. 5 is a sectional view, similar to Fig. 4, showing the cross sectional contour of the tear-off portion of the bar, and diagrammatically showing the tearing of a record form in many directions.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, there is shown in Fig. 1 a fragmentary view of an autographic register mechanism in which a record strip 1 is being advanced over a conventional writing table 2 of the register. Pin type feeding devices comprising wheels 3 and pins 4 are mounted on a shaft 5, the shaft being driven by any suitable means or by a hand crank (not shown).

Concentrically mounted upon the shaft 5 adjacent each pin wheel 4 is a control cam 6 which through an appropriate follower mechanism controls the lifting and lowering of the tear-off bar. The bar is lifted slightly during feeding operation, and then lowered during the tearing operation and during inscription of the next succeeding form then in recording position. The bar, when lowered, will be considered as being in home position, since this is the normal or rest position of the mechanism.

The tear-off bar 7 is substantially triangular in cross section (see Fig. 5), the rear surface 8 being substantially vertical, while the front surface 9 is inclined rearwardly at a substantial angle. Although through the central portion of the bar 7 the bottom is removed (see Fig. 3), there is provided at each end of the bar a bottom surface 10 which is formed with a slight curvature toward the front edge. The front edge 11 of the bar against which the strip is torn is formed about a radius rather than being a sharp angular corner.

Such curved or arcuate tearing edge has been found quite efficient and satisfactory in use, since it permits limited shifting of the record strips so that the strips may be torn at the desired place. Such record strips are usually provided with a transverse weakened division line, which, however, is not always in absolute alignment throughout the set of superposed forms. With the former sharp tearing edge, the strips were apt to tear along the edge of the tear-off bar, regardless of the exact location of the weakened division line. The present tear-off bar with its rounded or arcuate tearing edge permits a limited shifting of the strips to bring the strips into alignment with the tearing edge, or permits separation of the strips on their predetermined weakened division line even though such line is not in exact alignment with the tearing edge of the tear-off bar. The rounded edge of the bar exerts a bursting strain on the record strips rather than a shearing or cutting action thereon as has been the case with former tear-off bars.

The ends of the bar 7 are formed with forwardly and rearwardly projecting arms 12 and 13, respectively, which provide means for mounting the tear-off bar upon a pair of swinging arms 14. The arms 14 are pivoted at their front ends within the register cabinet as indicated in Fig. 3, and normally urged downwardly (clockwise direction) as shown in Figs. 1, 4 and 5. They may, however, be raised as shown in Fig. 3 to permit loading of the register with a new supply of forms.

Carried on each of the arms 14 is a cam follower 15, the periphery of which rides upon the periphery of cam 6 during the feeding operation. In such position the tear-off bar 7 is elevated slightly relative to the writing table 2 and the record strip 1, permitting free advancement of the record strip by the pin wheels 3. Upon completion of a feeding operation and return of the pin wheels to their "home" position, a notch 16 in cam 6 comes into registry with the followers 15, thereby permitting the arms 14 and the tear-off bar 7 carried thereby to drop into "home" position. In such position, the tear-off bar 7

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is lowered into pressure engagement with the record strip 1, thereby holding the strip against displacement during the tearing of the ejected record form.

Assisting in this holding operation is a pair of pressure fingers 17 carried by the tear-off bar 7 which overlie the record strip 1 and distribute the holding pressure of the bar 7 over additional area of the record strip. When the bar 7 is elevated during the feeding operation, the pressure fingers are likewise elevated, but only a sufficient distance to eliminate the frictional engagement thereof with the record strip. In such elevated position the fingers 17 assist in maintaining the strip 1 in engagement with the pins 4 of the pin wheels 3, during the feeding operation. Use of the fingers 17 as an additional holding means (Figs. 4 and 5) materially reduces the tendency of the strip to tear from the feeding pins, particularly when the strip is torn upwardly and rearwardly.

As shown in Figs. 1, 4 and 5, the fingers 17 maintain the record strip in engagement with a second pin, i. e., the pin immediately following the "home" position pin. Thus, resistance to the tearing force is also supplied by the second pin, rather than the entire tearing force being resisted by the single "home" position pin. When elevated during the feeding operation, the fingers 17 also insure feeding engagement of the second or succeeding pin within the marginal feeding configurations, thereby assisting in the feeding of the record strip by causing partial distribution of the feeding impulse to a second or succeeding feeding configuration.

As shown in Figs. 1, 2, 3 and 5, the rear surface 8, front surface 9 and bottom surface 10 of the bar 7 is notched or slotted as at 18 to permit passage of the pin 4 therethrough without interference therewith. The bottom surface 10, however, on either side of the slot 18 is engageable with the record strip when in home position, thereby holding the strip against movement induced by the tearing operation. Such holding of the strip by engagement therewith of the surfaces 10 takes place on opposite sides of the "home" position pin, thereby providing the resistance to movement of the record strip at the most important and critical point.

The rear surface 8 of the bar 7 is also cut away or relieved as shown at 19 (Figs. 1 and 3) so as to relieve any pressure upon the central portions of the record form. By so doing, the entire pressure of the hold-down and tear-off bar 7 is exerted at the sides of the strip immediately adjacent the feeding pins of the pin wheels 3. Such pressure is applied laterally on both sides of the feeding pins and is limited, so to speak, to the most important and critical areas of the record strip. It is these areas, immediately adjacent the feeding pins where mutilation occurs if the strip is not securely held in proper position during the tearing operation.

The present design of tear-off bar 7 permits the ejected record form to be torn from many angles, nearly straight out front to almost straight backward, as shown diagrammatically in Fig. 5. Special care or experience is not required to remove the ejected strip at many angles since the fingers 17 and the bar 7 securely hold the record strips in position, fully resisting the tension induced by the tearing strain. Mutilation of the feeding configurations in the succeeding record form is thereby completely eliminated. Not only does the present hold-down or tear-off bar 7 provide such beneficial results in the tearing of the ejected record form, but it also permits use of a second pin as a feeding pin which operation is not obtainable with tear-off bars heretofore in use.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect.

Having thus described our invention, we claim:

1. In an autographic register having a strip feeding mechanism, a duofunctional tear-off and hold-down

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member, including a light weight bar of substantially triangular cross sectional contour, a pair of slots in the bottom surface thereof in alignment with the strip feeding mechanism of the register and through which slots the strip feeding mechanism advances during advancement of the record strips through the register, a pair of rearwardly extending fingers carried by the bar and projecting in overlying relation with the strip feeding mechanism to maintain the record strips in engagement with the feeding mechanism, mounting means for the bar comprising a pair of arms pivotally mounted upon the register at one end thereof, to the opposite ends of which the bar is secured, means for elevating and lowering the bar in timed relation with the operation of the strip feeding mechanism including a cam associated with the strip feeding mechanism, and a pair of cam followers carried by the bar supporting arms, the construction and arrangement being such that the bar is elevated during operative periods of the strip feeding mechanism and lowered during inoperative periods thereof, and a rounded blunt edge on the front of the bar engageable with the strip when the bar is in lowered position, against which an ejected record form is torn from the record strip, the forward surface of the bar extending upwardly and rearwardly away from the rounded edge of the bar permitting tearing of the ejected form from the record strip by exertion of upwardly pulling influence thereon in many directions.

2. In an autographic register having a strip feeding mechanism, a duofunctional tear-off and hold-down member, including a light weight bar of substantially triangular cross sectional contour, the bottom surface being cut away throughout the major portion of its extent, a pair of slots in the remaining portions of the bottom surface adjacent the ends of the bar through which the strip feeding mechanism is free to pass during strip feeding operation, oscillatory supports for the bar pivotally mounted upon the register frame, actuating means for raising and lowering the pivotal supports in timed relation with the operation of the strip feeding mechanism to thereby raise and lower the bar relative to record strip therebeneath, feed fingers carried by the bar for unison movement therewith into and out of strip engaging position adjacent the strip feeding mechanism, and a round blunt edge on the front of the bar against which the strip is engaged for separation of an ejected record form therefrom, the strip being torn by an upward pull on the ejected form in many directions, the rearwardly inclined front surface of the triangular bar permitting a wide range of directions to the tearing motion.

3. A tear-off member for autographic registers, including a substantially triangular bar extending transversely of the register, oscillatory mounting means therefor, means for oscillating the bar relative to the register in timed relation with the operation of a strip feeding mechanism therein, and a round blunt forward edge on said bar, against which a record strip is engaged to tear an ejected form from the strip, the forward surface of the triangular bar extending upwardly and rearwardly from said round edge.

4. A hold-down member for an autographic register having a strip feeding mechanism, including a substantially triangular bar extending transversely of the register in overlying relation with a record strip thereon, oscillatory mounting means therefor, means for oscillating the bar in timed relation with the operation of the strip feeding mechanism, the bar being elevated relative to the strip during advancement of the strip and engaged with the strip in hold-down relation thereto during non-operating periods of the strip feeding mechanism, rearwardly projecting extensions carried by the bar and engageable with the strip rearwardly of the bar to assist in holding the strip in predetermined position during the time the bar is in engagement with the strip, said extensions including at least one feed finger cooperating with the strip feeding mechanism to hold the strip in engagement therewith.

5. A duofunctional hold-down and tear-off member for an autographic register having a pin type strip feeding mechanism, including a light weight bar extending transversely of the register and overlying the pin type strip feeding mechanism, means for normally biasing said bar downward into strip engaging position, actuating means operated in timed relation with the strip feeding mechanism to elevate said bar against its normal bias, one or

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more extensions carried by said bar and projecting rearwardly thereof into overlying engagement with the record strip, said extensions cooperating with the pin type feeding mechanism to cause engagement of the strip with more than one pin thereof during the periods of non-operation of the strip feeding mechanism, and a dull front edge on the bar against which an ejected record form may be engaged for detachment thereof from the record strip while the bar is in its lowered strip holding position, the construction and arrangement being such that the rearwardly projecting extensions distribute the resistance to the strain of separation to more than a single pin of the pin type feeding mechanism.

6. In an autographic register having strip feeding mechanism, a duofunctional hold-down and tear-off member, including a bar, the bottom surface of which has been removed throughout the central portion thereof, oscillatory mounting members therefor upon which the bar is mounted, said bar and members being normally biased toward strip engaging position, actuating means engageable with the mounting members to elevate said members and associated bar in timed relation with operation of the strip feeding mechanism, recesses in the bottom surface of the bar adjacent the ends thereof through which the strip feeding mechanism is free to pass, and a dull rounded front edge on said bar against which a record strip is torn, the front surface of the bar receding from the rounded front edge in an upwardly and rearwardly inclined direction.

7. A duofunctional hold-down and tear-off member for an autographic register, including a bar extending transversely of the register mechanism and beneath which a record strip is periodically advanced for separation of the ejected portion therefrom, a pair of strip engaging surfaces on the underside of the bar adjacent the ends thereof, a supplemental pair of strip engaging surfaces carried by the bar and extending rearwardly therefrom to engage the record strip in rearwardly spaced relation

with the bar, said strip engaging surfaces exerting sufficient pressure upon the strip to prevent movement of the strip during separation of the ejected portion therefrom, a front surface on the bar inclined in a plane divergent to the plane of the record strip, said front surface terminating in an arcuate area adjacent the record strip for engagement therewith during separation of the ejected portion of the record strip from the remainder thereof.

8. In an autographic register, strip feeding means, means for increasing the resistance to shifting of a record strip relative to its feeding means, including a bar extending transversely of the register engageable in hold-down relation with an underlying record strip, against which bar an ejected portion of the record strip may be torn from the remainder thereof, strip engaging surfaces adjacent the outer ends of said bar and located on opposite lateral sides of and adjacent the strip feeding means, supplemental strip engaging surfaces extending rearwardly from the bar on opposite lateral sides of the strip feeding means, the construction and arrangement being such that upon engagement of the bar with its supplemental strip engaging surfaces with the strip, shifting of the strip relative to its feeding means is effectively prevented, the resistance to such shifting being distributed over an enlarged area to prevent mutilation of the strip.

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