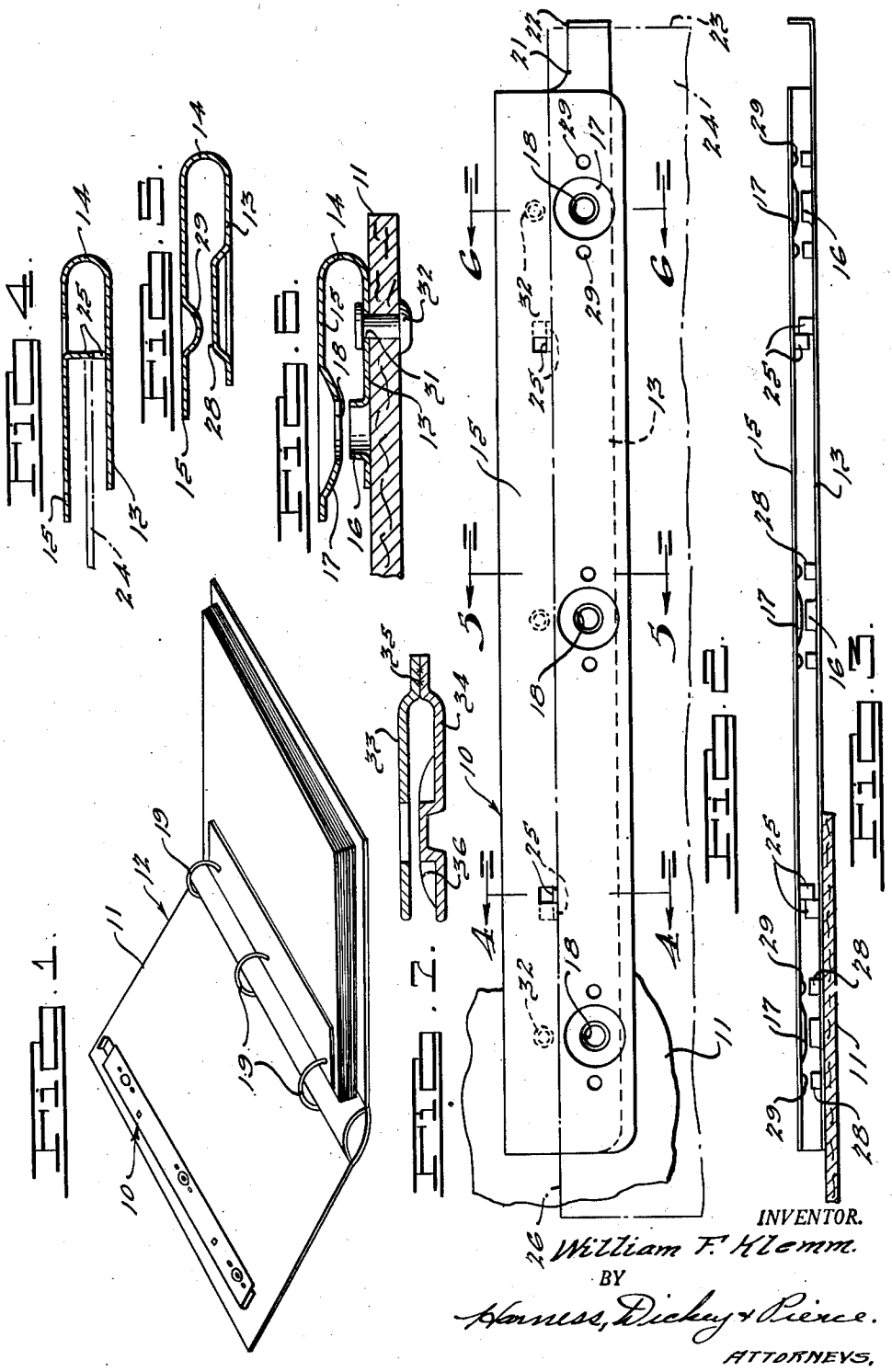
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PUNCH FOR LOOSE-LEAF BINDERS

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PUNCH FOR LOOSE-LEAF BINDERS

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1

This invention relates to punching devices for loose-leaf binders and particularly to a punching device made from a single piece of material which is attachable to a cover of a loose-leaf binder for punching holes in the paper conforming to the spacing, number and size of the rings on which the paper is supported.

It has been the practice heretofore to provide loose-leaf binders with different types and numbers of rings which are spaced varying distances apart thereby requiring different types of punching devices for punching holes in the paper which is to be applied to the binders. Separate adjustable types of punching devices have been provided in which a number of punching elements were adjusted to desired spacing so that the elements could be arranged to punch holes in paper for various types of binders.

The present invention contemplates the use of an inexpensive but positively operating punching device which is attached to and made a permanent part of each loose-leaf binder. The punching device is made from a single piece of sheet stock which has a certain amount of resiliency thereto so as not to take a permanent set when slightly deflected. This may be cold rolled steel, brass, steel alloy, plastic, resin, or any sheet material having slight spring characteristics. The device may be molded from moldable material into desired form or may be stamped from stock and bent back upon itself to have a web portion along one edge from which superimposed bottom and top flanges project.

Accordingly, the main objects of this invention are: to provide a punching device as a unit part of a loose-leaf binder; to form a unit punching device from suitable material which has guiding means for locating the sheet in the device and for guiding the sheet over the punching elements; to form a punching device from spring material having top and bottom flanges on one of which projecting elements are provided mated with die elements located on the other for punching holes in paper when the top flange is deflected downwardly toward the bottom flange; and in general to provide a punching device for a loose-leaf binder which is simple in construction, positive in operation and economical of manufacture.

Other objects and features of novelty of the invention will be specifically pointed out or will become apparent when referring, for a better understanding of the invention, to the following description taken in conjunction with the accompanying drawing, wherein

2

Figure 1 is a perspective view of a loose-leaf binder having a punching device thereon embodying features of this invention;

Fig. 2 is an enlarged plan view of the punch illustrated and attached to the loose-leaf binder of Fig. 1;

Fig. 3 is an edge view of the structure illustrated in Fig. 2;

Fig. 4 is an enlarged sectional view of the structure illustrated in Fig. 2, taken on the line 4—4 thereof;

Fig. 5 is an enlarged sectional view of the structure illustrated in Fig. 2, taken on the line 5—5 thereof;

Fig. 6 is an enlarged sectional view of the structure illustrated in Fig. 2, taken on the line 6—6 thereof, and

Fig. 7 is a sectional view of structure similar to that illustrated in Fig. 6, showing a different form of the invention.

Referring to the figures, a punching device 10 is illustrated attached to the inner surface of the cover 11 of a loose-leaf binder 12 of conventional form. While the punch 10 is illustrated as being mounted in this manner, it is to be understood that the punch may be mounted at any other convenient place on the binder, on the outer face of the cover, on the rings in the center of the binder, or at any other convenient point.

As illustrated more specifically in Figs. 2 to 5, the punch 10 embodies a strip of material which is herein illustrated as having been formed and stamped to provide a bottom flange 13, an arcuate web portion 14, and a top flange 15. Any sheet material may be employed which has sufficient resiliency to maintain its form when the top flange is deflected toward the bottom flange sufficiently to punch holes in a sheet of paper disposed therebetween. The bottom flange has punching elements 16 formed therein by drawing flanged apertures upwardly therein, as illustrated more specifically in Fig. 6. The top flange 15 has dimpled areas 17 containing an aperture 18 which is aligned with the punching element 16 and forms a cutting die for forcing the paper downwardly over the element. Any number of the

punching elements 16 and apertures 18 may be provided in the length of the flanges 13 and 15, spaced apart amounts conforming to the number and spacing of the rings 19 of the loose-leaf binder 12.

Projecting from the right-hand end of the bottom flange 13, as viewed in the Figs. 2 and 3, is a guide element 21 having an upwardly projecting stop flange 22 which positions the top edge 23 of a sheet of paper 24 in the punch. Aligned projecting fingers 25 are struck from the top and bottom flanges 13 and 15 to provide locating means for the rear edge 26 of the sheet of paper 24 for spacing the punch holes a predetermined distance from the rear edge of the sheet. On each side of the punching elements 16, locating members 28 are formed by lancing the lower flange to provide strips which are offset upwardly from the plane of the flange 13 to a height equal to, or slightly above, that of the punch elements 16. The members 28 guide the sheet of paper over the top of the punch elements when being inserted between the flanges 13 and 15 of the punch.

Stop projections 29, aligned with the guide elements 28, may be offset in the top flange 15 for limiting the degree of deflection of the top flange and preventing the over-straining of the material forming the punch. A plurality of apertures 31 may be provided in the lower flange 13 by which the punch is secured by rivets or other means 32 to the cover 11 of the loose-leaf binder.

It is to be understood that other means may be employed, such as struck-out tongues, in the lower flange for securing the device to the cover or other element to which it is attached. It is within the purview of the invention to provide means for attaching the device to the rings of the loose-leaf binder so as to be detachable therefrom. It will be noted that the device is made from a single piece of material having means for accurately locating the top and rear edge of the paper relative to the punching element and that the punching device is so constructed as to have the paper accurately guided between the punch element and the cutting die portion disposed thereabove. Stop means are provided for limiting the downward movement of the top flange to prevent the straining of the material beyond its elastic limit so that inexpensive materials may be employed to maintain the cost of the punch at a minimum.

In Fig. 7 a further form of the invention is illustrated, that wherein top and bottom portions 33 and 34 of a punching device are molded, stamped, or otherwise shaped to predetermined form and secured together along the abutting edges at 35, as by welding, riveting or the like. Embossed portions 36 are provided adjacent to the punch for guiding the paper thereover when inserted between the portions 33 and 34. The portions 36 are spaced a sufficient distance each side of the punch to permit the top portion 33 to deflect thereover to punch a hole in a sheet of paper. Otherwise the punching device is the same as that herein illustrated and described including the stop gauges and stop flanges thereof.

While the punching device may be employed alone for punching holes in paper conforming to the location of rings in a predetermined type of binder, the punching device is preferably attached to each of the binders so as to be available at all times for punching sheets which are to be inserted therein. While the punching device was described herein as being made from sheet metal, it is to be understood that it may be molded or formed from plastic or materials other than metals having the required amount of resiliency. In any case, a unit punching device is provided which is inexpensive and positive in operation.

What is claimed is:

1. A device for punching holes in the edge of a sheet which includes a U-shaped sheet metal element formed from a single resilient metal sheet to have a bottom flange, vertically disposed web and a top flange disposed above and spaced from said bottom flange, tubular punches formed in and projecting upwardly from the bottom flange, said top flange being provided with apertures aligned and snugly engageable with said punches, said punches and aligned apertures being disposed in pairs which are spaced a predetermined distance from each other.

2. A device for punching holes in the edge of a sheet which includes a U-shaped sheet metal element formed from a single resilient metal sheet to have a bottom flange, vertically disposed web and a top flange disposed above and spaced from said bottom flange, tubular punches formed in and projecting upwardly from the bottom flange, said top flange being provided with apertures aligned and snugly engageable with said punches, said punches and aligned apertures being disposed in pairs which are spaced a predetermined distance from each other, and tabs struck up from said bottom flange and disposed adjacent to said punches for guiding a sheet thereover when inserted between the flanges.

3. A device for punching holes in the edge of a sheet which includes a U-shaped sheet metal element formed from a single resilient metal sheet to have a bottom flange, vertically disposed web and a top flange disposed above and spaced from said bottom flange, tubular punches projecting upwardly from the bottom flange, said top flange being provided with apertures aligned and snugly engageable with said punches, struck-up tabs adjacent to said punches for guiding a sheet thereover when inserted between the flanges, and projections on said upper flange aligned with said tabs for limiting the degree of movement of the flanges toward each other.

4. A device for punching holes in the edge of a sheet which includes a U-shaped sheet metal element formed from a single resilient metal sheet to have a bottom flange, vertically disposed web and a top flange disposed above and spaced from said bottom flange, tubular punches projecting upwardly from the bottom flange, said top flange being provided with apertures aligned and snugly engageable with said punches, struck-up tabs adjacent to said punches for guiding a sheet thereover when inserted between the flanges, projections on said upper flange aligned with said tabs for limiting the degree of movement of the flanges toward each other, and aligned tabs extending upwardly from the bottom flange and downwardly from said upper flange inwardly from said web for positioning the rear edge of a sheet relative to the punches.

5. A device for punching holes in the edge of a sheet which includes a U-shaped sheet metal element formed from a single resilient metal sheet to have a bottom flange, vertically disposed web and a top flange disposed above and spaced from said bottom flange, tubular punches projecting upwardly from the bottom flange, said top flange being provided with apertures aligned and snugly engageable with said punches, struck-up tabs adjacent to said punches for guiding a sheet thereover when inserted between the flanges, projec-

tions on said upper flange aligned with said tabs for limiting the degree of movement of the flanges toward each other, aligned tabs extending from said flanges for positioning the rear edge of a sheet relative to the punches, and additional means for positioning the top edge of the sheet relative to the punches for accurately locating the holes in the sheet.

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