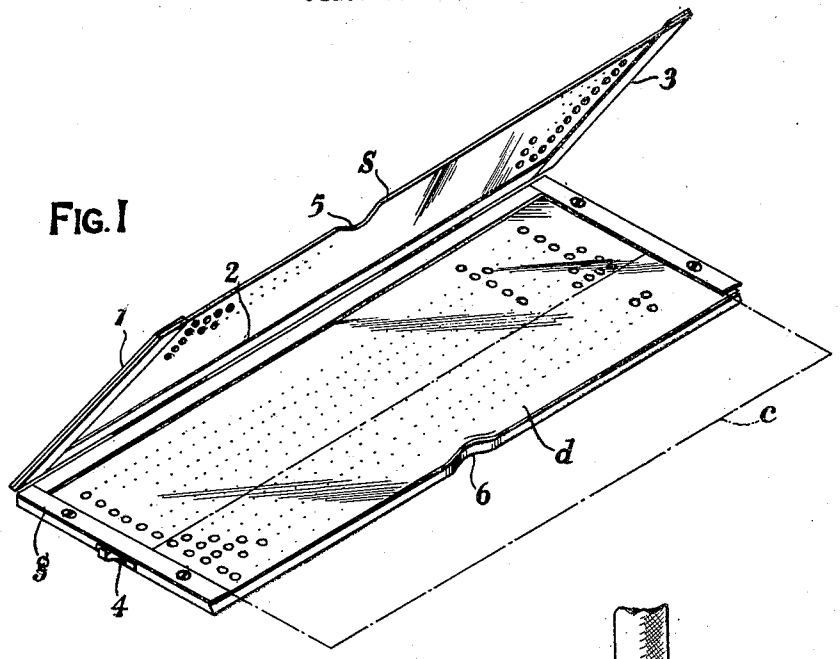
Aug. 16, 1932. F. G. S. ENGLISH 1,871,597

APPARATUS FOR PUNCHING HOLES IN STATISTICAL OR LIKE RECORD CARDS

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FIG. 1



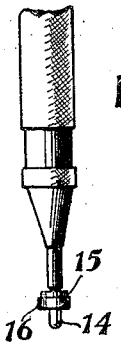


FIG. 4

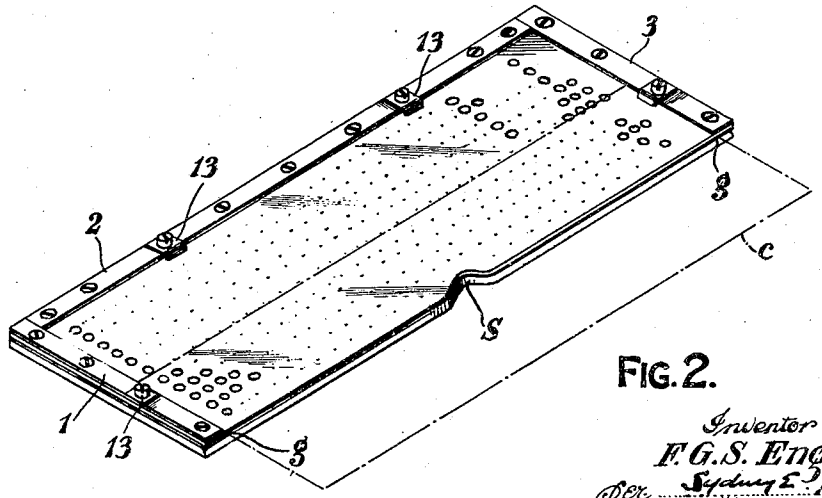


FIG. 2.

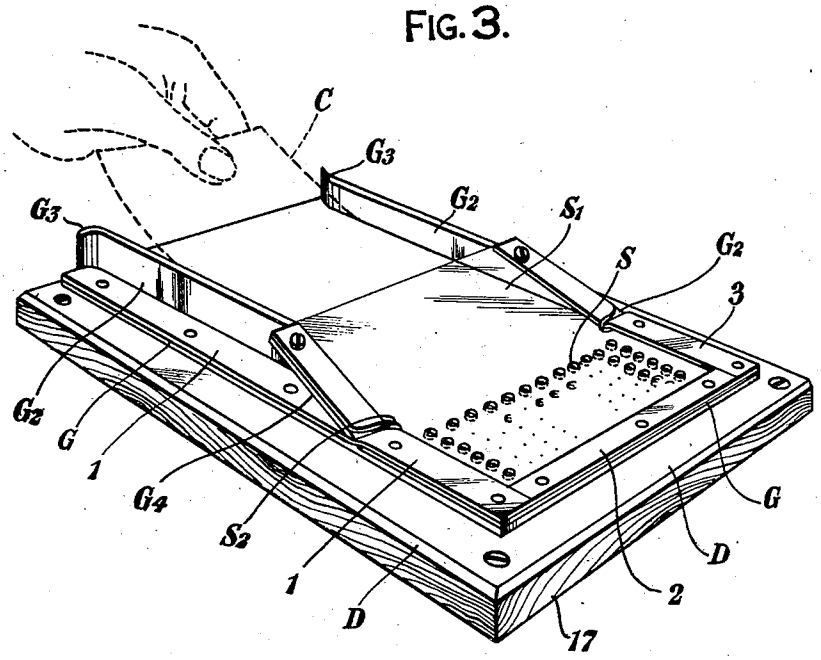
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APPARATUS FOR PUNCHING HOLES IN STATISTICAL OR LIKE RECORD CARDS

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FIG. 3.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR PUNCHING HOLES IN STATISTICAL OR LIKE RECORD CARDS

Application filed October 9, 1929, Serial No. 398,530, and in Great Britain October 19, 1928.

This invention relates to apparatus for punching holes in statistical or like record cards.

In the passage of statistical or like record cards through power operated punching machines, there occasionally occur faults in the cards due to the momentary inoperation of one or more of the punches, and the only means of rectifying this error in the statistical card is to pass it again through the machine. This error will usually have occurred in several cards, and consequently there is great delay in the separate treatment of these cards through such a machine.

The object of the present invention is to devise improved means of readily dealing with single cards for the purpose of rectifying errors, or for producing a duplicate of a card, which, if having the correct perforations, may be otherwise damaged to make it unsuitable for use in a tabulating machine.

According to the present invention an apparatus for punching by hand individual holes in statistical or like cards comprises in combination a holder including a die plate perforated according to the rows and columns on a card associated with guides for definitely aligning a card thereto and a stripper formed with perforations similar to the die plate and in register therewith, whereby a plurality of holes may be punched by hand in succession without moving the card, holder or stripper.

The stripper plate may be hinged (and may be detachable) or may be fixed to the die plate the one overlying the other in such manner as to permit the introduction of a card and positive location thereof. Preferably an opening is left in the long side so that a card may be introduced by lateral movement. Though in a small form of apparatus an opening may be made so as to introduce the card by longitudinal displacement. To this end the stripper may be warped at its leading edge so as to provide an open mouth at the entry between the die plate and the stripper to facilitate introduction of a card. The guides for setting the card accurately over the perforations on the die plate provide supports for the upwardly warped entry end of the stripper plate.

Where it is desired to hand punch on cards a particular perforation, for instance, one previously omitted during the passage of the cards through a power operated punch, the stripper plate is formed of transparent material so that the whole of the card is always visible and the rows and columns of the card can be read by the eye to predetermine and check the position of the holder to be punched with the apparatus. Preferably the stripper is transparent though it may be of metal for reproduction purposes.

In the construction of an apparatus for the reception of a card for punching a plurality of holes, or for reproduction purposes, guides are provided above the stripper plate for the key card and the card on which the perforations are to be repeated from the key card is inserted between the stripper plate and the die plate as before, the punch being operated through the holes on the key card to produce corresponding holes on the card within the apparatus.

Apparatus according to the present invention may be used in various circumstances and positions, for instance, the apparatus may be used for punching special holes in a few cards, and the apparatus can be included in a power driven punch so as to be handy to correct cards, where punches have not been properly operated, or, and preferably, it is a portable device which can be used for instance on a desk or bench.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawings which show some preferred forms of a portable apparatus embodying the present invention.

Fig. 1 is a perspective view showing a construction in which the stripper is hinged to the die plate.

Fig. 2 is a perspective view showing a compact form of the construction in which no moving parts are included.

Fig. 3 is a perspective view showing a modified form of apparatus according to the invention for punching holes at one end of a card.

Fig. 4 shows a punch with the preferred form of bit used in conjunction with the apparatus shown in Figs. 1, 2, and 3, for perforating statistical cards.

Throughout the drawings like reference numerals designate the same or similar parts.

Referring first to Fig. 1, the stripper S of transparent material, e. g. celluloid is carried on a frame having three sides 1, 2, 3, the long side 2 of which is hinged to the die plate D, either as a fixed or detachable member, the die plate being covered on three sides by a frame G which forms stops or guides for three sides of a statistical card for definitely locating the card correctly and accurately over the perforations in the die plate, the frame G, being secured to the die plate D by rivets or other means leaving a plane upper surface for the seating of the stripper.

The thickness of the guiding frame on the die plate D is such as to permit the location of one or perhaps two statistical record cards between the stripper and the die plate during a punching operation.

The die plate may include a claw 4 at one or both ends of springy nature to grip the sides 1 and 3 of the stripper frame when it is disposed on the die plate for punching operations.

Both the stripper and the die plate may be recessed as indicated at 5 and 6 respectively to permit a finger and thumb engagement of the card to facilitate withdrawal.

In the construction shown in Fig. 1 the die plate is perforated all over its surface as indicated by the circles and dots shown in Fig. 1, the dots representing the centres of holes not shown, the holes being spaced in rows and columns so that there is a hole in the die plate for the formation of a perforation at any part of the rows of columns of a statistical card, the stripper being similarly perforated.

With such an apparatus a card positioned on the die plate may be secured by folding down the stripper and then by operating through holes in the stripper. A plurality of holes as required may be made in the card without moving the card or any part of the apparatus and every operation is completely visible at all times.

In order, however, to avoid any moving parts in an apparatus according to the invention the stripper plate S may, as shown in Fig. 2, be made a fixture by means of rivets or screws passing through marginal strips forming in nature the three sides 1, 2, 3 of a frame, as already referred to in Fig. 1. The stripper being spaced from the die plate D by packing strips G equivalent to the guide frame G of Fig. 1, thereby leaving an opening at one longitudinal side of the apparatus for the introduction by lateral movement of a card.

In Figs. 1 and 2 the position of a partly inserted card by lateral movement is indicated by the dot and pick lines C.

Instead of using a die plate of the length of a card and forming the construction so that the card is introduced by lateral movement, an apparatus may be constructed so that a card can be passed through the apparatus by a longitudinal movement of the card, and thereby a small form of apparatus is provided.

In the construction shown in Fig. 3 the die plate D which is perforated at one end according to the columns of perforation in the card at one end is carried on a bed plate or stand 17, and about the perforated end of the die plate D is fixed on a guiding frame G similar to that shown in Fig. 1. The transparent stripper S is secured to the die plate by marginal strips 1, 2, 3 preferably fixed to the guide frame G by rivets, in manner similar to that shown in Fig. 3. The card C is introduced from the other end of the plate and passes between vertical guides G^2 which may be integral with the guides G, but bent at the entry ends G^3 so as to facilitate the introduction of a card C indicated in dotted lines. By pushing the card between the guides G^2 until it is within the guiding frame G under the stripper S, the card will be automatically set in proper position for punching holes in accurate dispositions on the card.

To facilitate the entry of the end of the card under the stripper S, the latter may be warped at its entry end upwardly so as to provide an open mouth between the stripper and the die plate. Conveniently, the guides G^2 may include supports G^4 for the warped end S^1 of the stripper S which latter is slotted as indicated at S^2 in order to permit the stripper passing from below the marginal strips 1 and 3 to a position above them.

In the construction shown in Figs. 1, 2 and 3 where a frame G is employed which forms stops or guides for three contiguous sides of a statistical card on the die plate for setting the card relatively thereto, three marginal guides are formed which definitely set the card in two directions whereby accurate disposal of the card with regard to the die plate for a punching operation is assured. Consequentially, instead of using a frame with the three marginal members integral, short strips may be used along the respective sides of the die plate or other forms of pins or stops employed to obtain the registration of the plate by setting the card on three contiguous sides. Obviously, instead of using that part of the guide frame G under the strip 2 as a stop for the leading edge of the card, pins or stops may be provided in front of the strip, for example, set up in the die plate itself.

Instead of employing the apparatus for correcting cards it may be employed for re-

producing purposes by laying a key-card on top of the stripper and another card on which the perforations of the key-card are to be reproduced between the stripper and the die plate, the punching operation being effected through the key-card and stripper. For such use an apparatus according to the invention may include a metal stripper.

For reproduction purposes the overlying strips 1, 2, 3 (Fig. 2) or the corresponding sides of the frame shown in Fig. 1, may be undercut or bevelled to accurately and definitely locate and retain a key card disposed over the stripper, by providing stops for the three juxtaposed edges introduced into the apparatus.

Alternatively the inner edges of the strips 1, 2, 3 shown in Fig. 2, or of the sides 1, 2, 3 of the frame shown in Fig. 1, may be accurately faced so as to definitely locate the card over the stripper accurately with regard to the perforations therein and clips such as 13 carried by the members 1, 2, 3 provided for retaining the card in set position.

Generaly speaking, however, the apparatus will not be used for reproduction purposes, but, as herein stated, for the correction of cards by the inclusion of perforations not produced by a power operated punch, and having in mind this object of the invention, it is preferred that in all constructions the stripper be formed of transparent material such as celluloid of sufficient thickness to withstand the operations without rupture, that is to say, that the stripper S, such as shown in Figs. 1 and 3, is made so that the whole of the card inserted in the apparatus is visible at one and the same time, thereby the operator can see the actual position on the card where the perforation is being made, and at the same time the stripper is strong enough to strip the card from the punch when the latter is withdrawn and is efficacious for use in reproduction processes.

In conjunction with a die and transparent stripper, as herein described, it is preferred to use a punch of the known spring load percussion type, the punch comprising a rounded or spherical bit as indicated at 14 in Fig. 4, carried on a spring controlled barrel, not shown, suddenly released when a predetermined pressure has been applied, the bit being a removable member and including a shoulder 15 against which is lodged a compressible bearing ring or washer 16 which can be made of rubber, and which, during the punching operation, overlies the stripper, thereby preventing the latter being damaged during the effort of punching a hole.

By the present invention an apparatus is provided for punching by hand in various circumstances accurately positioned holes in a card or for reproducing holes from a previously punched card for use in statistical, calculating or like machines, wherein the accuracy of the formation of the perforations has to be minute. Moreover, a portable form of apparatus is provided which in its preferred form is a simple construction without moving parts which could get out of order, and may be used by the checking staff away from the perforating or tabulating machines.

Further, in all constructions the apparatus is such as can be used by unskilled persons who have merely to insert the card between the stripper and the die plate and to produce the perforation by vertically setting the punch above the hole in the stripper in register with the part of the card to be perforated and to depress the punch until the bit passes through the stripper and card, and especially is this correct operation obtainable by an inexperienced operator when the transparent stripper is utilized.

What I claim is:—

1. A holder for individual statistical cards or the like while being punched by a separate hand tool comprising a die plate perforated according to the rows and columns on the card to be punched, guides on the side edges of the die plate for definitely aligning a card therewith, a transparent stripper flexibly connected along one edge with the die plate whereby it may be swung relatively thereto to permit the insertion or removal of a card and formed with perforations corresponding to and in registry with those in the die plate, whereby when a card is inserted between the die plate and stripper with the parts in superimposed relation a plurality of holes may be accurately punched by the separate hand tool as desired without moving the holder, stripper, or the card therebetween.

2. An apparatus for punching by hand individual holes in statistical or like cards comprising in combination a holder including a die plate perforated according to the rows and columns on a card associated with guides for definitely aligning a card thereto, and a transparent stripper formed with perforations similar to the die plate and in registry therewith, whereby a plurality of holes may be punched by hand in succession without moving the card, holder or stripper, and guides above the stripper plate for the reception of a key card the holes in which are to be reproduced in a card interposed between said stripper and die plates.

3. Apparatus for punching by hand individual holes in statistical or like cards comprising in combination a holder including a die plate perforated according to the rows and columns on a card, guides on three contiguous sides of said die plate, a transparent stripper covering said die plate and spaced therefrom by said guides, said stripper being formed with perforations similar to those on the die plate and disposed in registry therewith, the other side of said die plate being cut away

to facilitate manipulation of the cards between said die plate and stripper.

4. Apparatus for punching by hand individual holes in statistical or like cards comprising in combination a holder including a die plate perforated according to the rows and columns on a card, guides on three contiguous sides of said die plate, a stripper covering said die plate and spaced therefrom by said guides, said stripper being formed with perforations similar to those on the die plate and disposed in registry therewith, and guides on said stripper disposed to locate a key card thereon the perforations of which are to be reproduced on a card located between said stripper and die plate by the guides on said die plate.

5. Apparatus for punching by hand individual holes in statistical or like cards comprising in combination a holder including a die plate perforated according to the rows and columns on a card, guides on three contiguous sides of said die plate, a stripper covering said die plate and spaced therefrom by said guides, said stripper being formed with perforations similar to those on the die plate and disposed in register therewith, guides along three contiguous sides on the outside of said stripper overlying said guides on said die plate for the reception of a key card, and spring clips for retaining said key card on said stripper.

In testimony whereof I affix my signature.

FRANCIS GUY SYDENHAM ENGLISH.