July 3, 1923. 1,460,647

I. H. FRUCHTER

DEVICE FOR PERFORATING PAPER

Filed Sept. 21, 1921 2 Sheets-Sheet 1

Fig. 1.

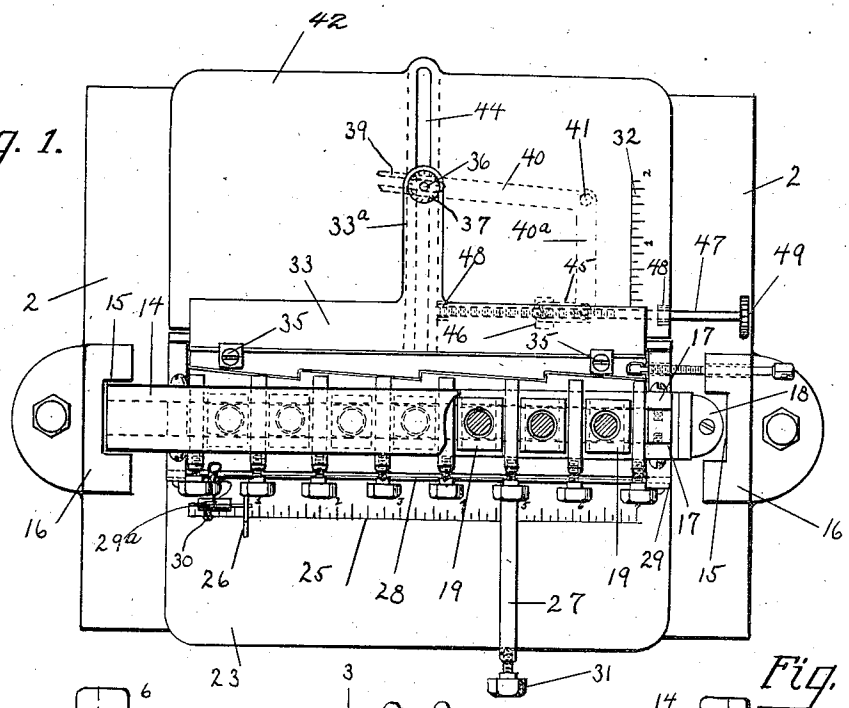


Fig. 6

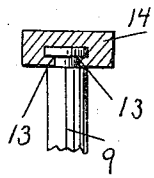
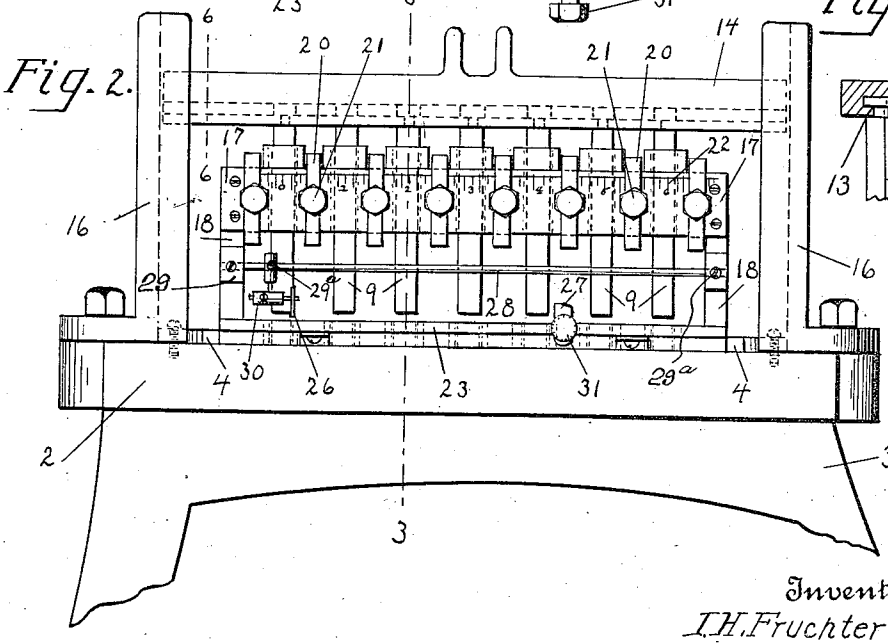


Fig. 2.



Inventor
I.H. Fruchter
By his Attorney J.J. Fontain

July 3, 1923.

1,460,647

I. H. FRUCHTER

DEVICE FOR PERFORATING PAPER

Filed Sept. 21, 1921

2 Sheets-Sheet 2

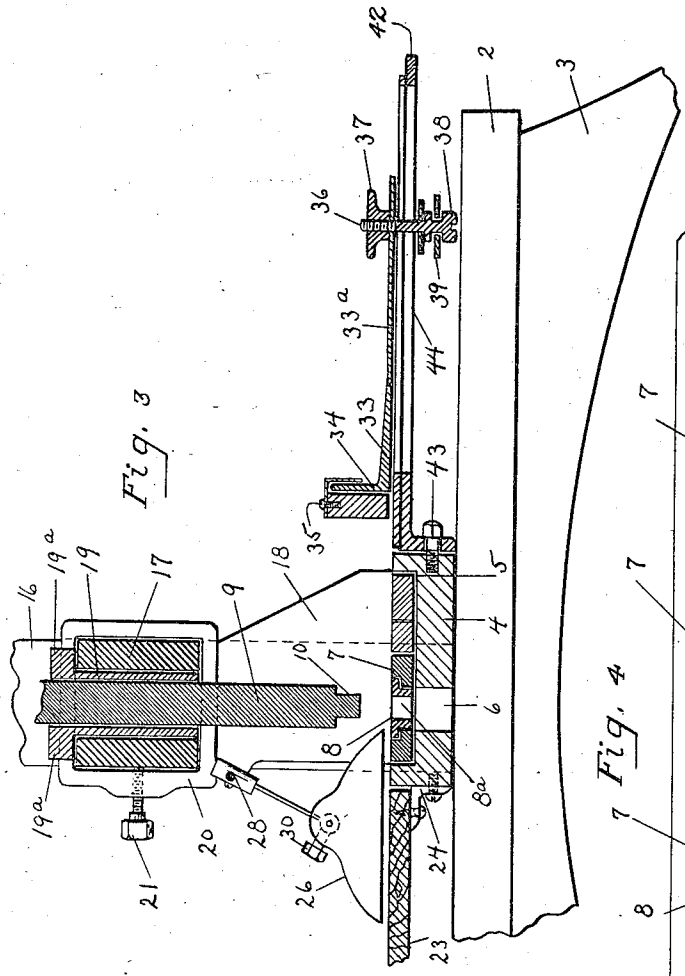


Fig. 3

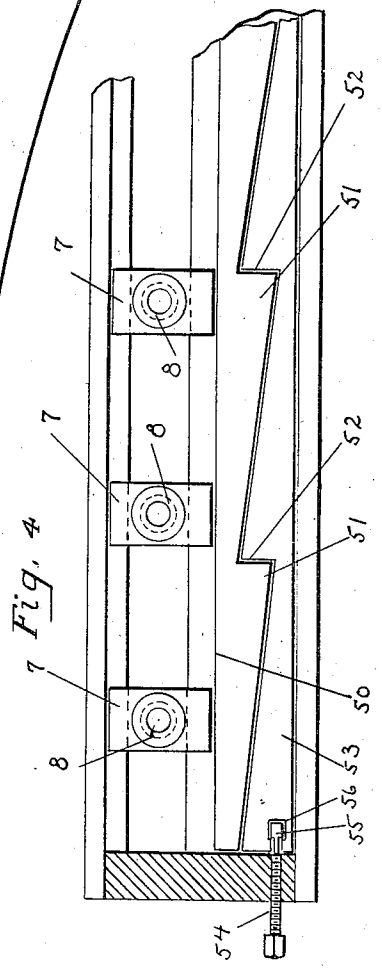


Fig. 4

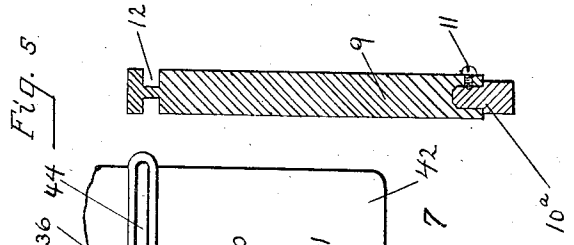


Fig. 5

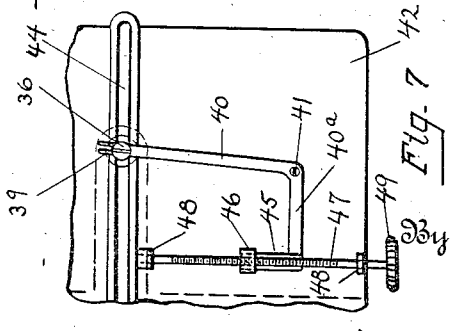


Fig. 7

Inventor

I. H. Fruchter

By his Attorney

L. J. Fontaine

Patented July 3, 1923. 1,460,647

UNITED STATES PATENT OFFICE.

ISRAEL H. FRUCHTER, OF NEW YORK, N. Y.

DEVICE FOR PERFORATING PAPER.

Application filed September 21, 1921. Serial No. 502,105.

To all whom it may concern:

Be it known that I, ISRAEL H. FRUCHTER, citizen of the United States, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Devices for Perforating Paper, of which the following is a specification.

This invention relates to perforating devices, having reference particularly to an improved apparatus for perforating a pile of paper sheets of the character adapted for use in loose leaf binders.

The invention has for an object the provision of means for punching a row of accurately spaced perforations through a relatively large number of superposed sheets.

A further object is to provide a device of this character which is simple in construction, durable and inexpensive and which comprises a plurality of elements arranged in compactly assembled correlation and adapted to coactively move to perform their several functions.

In carrying out my invention I employ a plurality of reciprocative male or plunger-die members adapted to be vertically moved by any suitable pressing means, a plurality of female die members registering therewith, means for laterally spacing and supporting said dies, means for gaging them in properly spaced correlation and means for locking and fixing them in such correlation, means for guiding and gaging a pile of sheets to be perforated, and other novel features all as hereinafter fully described and specifically set forth in the appended claims.

In the accompanying drawings forming part of this specification, Figure 1 is a plan view illustrating an embodiment of my improvements;

Fig. 2 is a face view thereof;

Fig. 3 is a fragmentary cross sectional view, drawn on an enlarged scale, and taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary plan view, drawn on an enlarged scale and showing a means for clamping the female die members on the bed of the apparatus;

Fig. 5 is a vertical sectional view of one of the male die members;

Fig. 6 is a fragmentary cross section taken on the line 6—6 of Fig. 2; and

Fig. 7 is an inverted plan view of part of the operating mechanism of the device.

In the drawings, 2 indicates a bed-plate which is mounted on suitable standards 3. Fixedly mounted on the bed-plate 2 and extended longitudinally thereacross is a supplementary bed-plate 4 having a longitudinal groove 5 and a slot 6. Within the groove 5, are slidingly mounted a plurality of female die plates 7, having respectively, a countersunk female die-section 8, these die-sections are removable and interchangeable, whereby they may have openings 8^a of various diameters for registering with plungers 9 having die members 10 of various diameters.

The die 10 may be formed integral with the plunger 9, as shown in Fig. 3 of the drawings, or it may removably engage a recess in the lower end of the plunger and be fixed in place by means of a set screw 11, whereby dies of various diameters may be attached to the plungers 9. for the purpose of punching different sized holes.

The plungers 9 are respectively provided with an annular groove 12 for engagement with flanges 13 of a grooved follower 14, which reciprocates within vertical grooves 15 of standards 16, which are mounted on the bed-plate 2.

Extended longitudinally over the supplementary bed-plate 4 and spaced therefrom by means of standards 18, mounted on the bed-plate 2, is a longitudinally slotted hanger 17, within which are slidingly mounted a plurality of sleeves 19, which are square in cross section and are respectively provided with a central bore for engaging the plungers 9, each of said sleeves having flanges 19^a which bear on the upper surface of the hanger 17, whereby said sleeves are suspended within the slot of said hanger and adapted for slidable movement thereacross. These sleeves are held in predetermined arbitrarily fixed spaced positions in the hanger 17 by means of clamps 20 which extend around the hanger and contact with opposite sides of the sleeves 19, thus said sleeves may be set and fixed at arbitrarily selected

distances apart, and the clamps are held in fixed correlation with the hanger by means of set-screws 21. While in the drawings I have shown the full number of sleeves and plungers the structure is capable of accommodating, it is obvious that a lesser member, depending upon the number of holes required for sheets of different widths, may be employed. As a means for gaging the distance between the plungers, whereby they may be accurately set, the face of the hanger 17 is provided with a calibrated scale 22.

Mounted across the front of the supplementary bedplate 4, by means of brackets 24, is a table 23 for supporting a pile of paper sheets to be punched, and a scale 25 is provided on the face of said table 23, for gaging the width of said sheets, said pile of sheets being held in place by means of a slidably adjustable and swingingly mounted clamping member 26 and guide 27. The clamping member 26 is swingingly and slidably adjustable on a rod 28 which is supported by hangers 29 of the standards 18, and said clamping member is held in place by means of set-screws 29^a and 30, whereby it may be securely clamped over the top of a pile of sheets to hold said pile in place while they are being punched. The guide 27 holds one side of the pile against displacement and it is held in fixed engagement with the table by means of a set-screw 31.

The distance between the rearward edge of the pile of sheets and a row of holes to be punched is gaged by means of a scale 32 and a slide 33, having an upturned flange 34, which supports slidably adjustable guide plates 35, which are set to bear on the rearward edge of the pile. The slide 33 has a rearwardly extended arm 33^a, through which extends a screw 36, which is held in place by means of a nut 37, the head 38 of said screw being provided with an annular groove which engages the forked end 39 of one arm 40 of a bell-crank lever which is pivoted on a stud 41 that extends from the surface of a rearwardly extended table 42, held to the supplementary bed-plate 4 by means of screws 43. This table is provided with a slot 44, through which the screw 36 extends, whereby actuation of the bell-crank lever moves the slide 33 back and forth. The other arm 40^a of the bell-crank lever is in pivotal engagement with one end of a connecting rod 45, which is pivoted at its other end to a nut 46, which is threaded to a screw 47 turnably mounted in studs 48 of the table 42, said screw having a milled head 49, whereby it may be rotated to actuate the bell-crank lever.

The die-plates 7 are slidable within the groove 5 of the supplementary bed-plate 4, and they are held in set position within said groove by means of a clamping member 50 having wedge-like teeth 51, which interlock with similar teeth 52, of a reciprocative bar 53 adapted to be actuated by a screw 54, having a head 55, which engages a socket 56 of the bar 53, whereby rotation of the screw 54 imparts sliding movement to the bar 53, for the purpose of wedging the member 50 against the die-plates 7 to hold them securely in place.

In the operation and use of the invention a suitable number of plungers and male dies are placed and set in proper correlation registering over a similar number of female die members. Then a pile of sheets of paper to be perforated is set and fixed in place in contact with the guide 27 and the guide plates 35, and the clamping member 26 is placed thereover and held in place by means of the set screws 29 and 30. Then by applying pressure to the follower 14 the dies are forced through the pile and into the die-members 8, the punched out portions of the paper passing through said die-members 8 and discharged through the slot 6.

I do not wish to be understood as confining myself to the specific details of mere mechanical construction and formation of the elements of my invention as herein shown and described, as I believe that under the spirit of my invention I am entitled to employ such variations of minor details as may fall under the scope of the appended claims.

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

1. In a perforating device, a plurality of reciprocative plunger-dies adapted to be vertically moved by pressure, and a follower for holding said dies, adjustable sleeve-bearings for said dies, means for mounting said bearings and means for fixing said bearings in spaced relation, and a plurality of pierced die-plates having their openings in register beneath said plunger-dies, and a table for carrying a plurality of sheets to be perforated by said plunger-dies, and means for fixing said sheets over said die-plates, and means for guiding and gaging said sheets comprising a reciprocating slide, and means for actuating said slide and means for mounting and supporting the said parts.

2. In a perforating device, a plurality of reciprocative plunger-dies adapted to be vertically moved by pressure, and a follower for holding said dies, adjustable sleeve-bearings for said dies, means for mounting said bearings and means for fixing said bearings in spaced relation, and a plurality of pierced die-plates having their openings in register beneath said plunger-dies, and a table for carrying a plurality of sheets to be perforated by said plunger-dies, and

means for fixing said sheets over said die-plates, and a scale for indicating the width of said sheets, and means for clamping and guiding said sheets on said table, and means for guiding and gaging said sheets comprising a reciprocating slide, and a scale, and a bell-crank lever and screw for operating said slide, and means for mounting and supporting the said parts.

Signed at city of New York in the county of New York and State of New York this 27 day of July A. D. 1921.

ISRAEL H. FRUCHTER.