

No. 645,264.

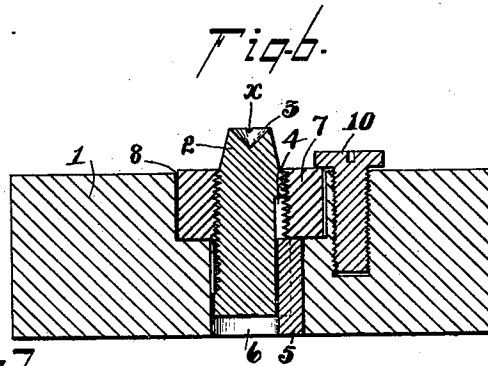
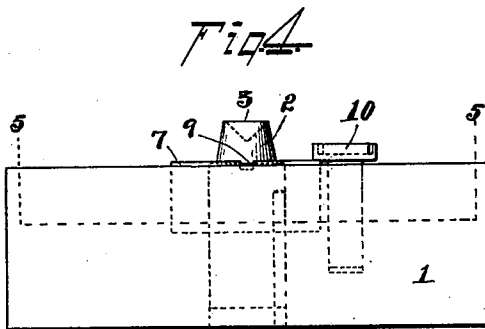
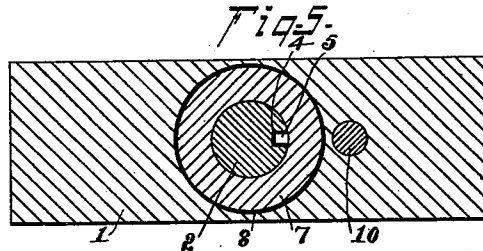
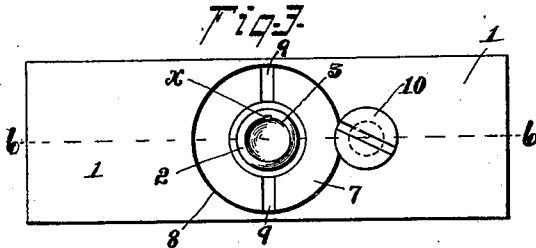
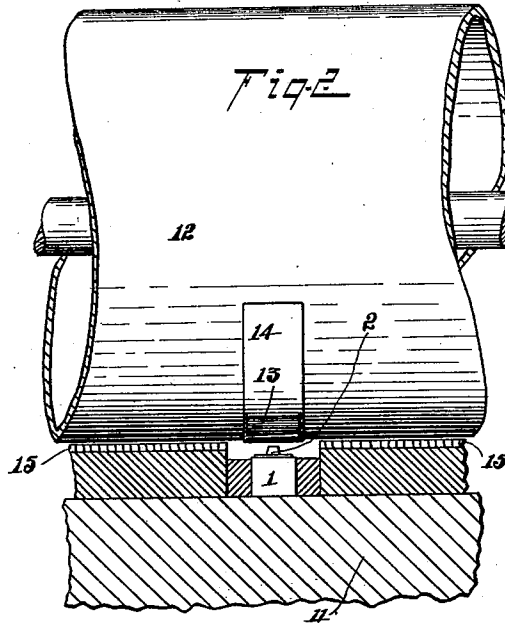
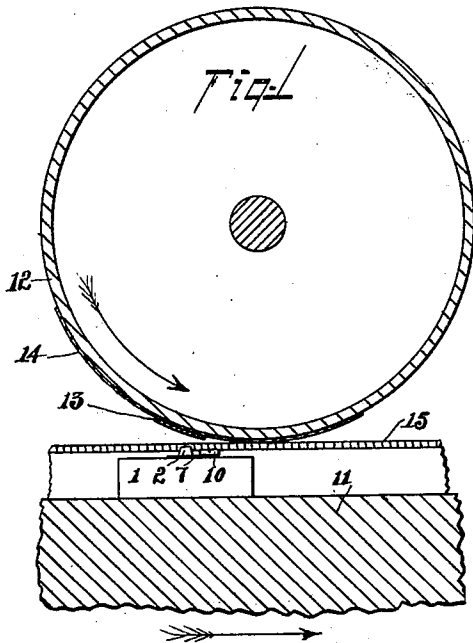
Patented Mar. 13, 1900.

H. K. KING.

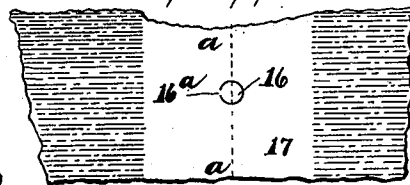
SHEET PERFORATOR FOR PRINTING PRESSES.

(Application filed Jan. 12, 1899.)

(No Model.)



WITNESSES:
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SHEET-PERFORATOR FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 645,264, dated March 13, 1900.

Application filed January 12, 1899. Serial No. 701,965. (No model.)

To all whom it may concern:

Be it known that I, HOWARD K. KING, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Devices for Perforating Sheets of Paper in Printing-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a transverse section of a printing-press of well-known form having my invention applied thereto. Fig. 2 is a side elevation, partly in section, of the same parts of the press. Fig. 3 is a plan view, enlarged, of my punching device, which is shown reduced in Figs. 1 and 2. Fig. 4 is a side elevation of the device. Fig. 5 is a section on line 5 5, Fig. 4. Fig. 6 is a section on line 6 6, Fig. 3. Fig. 7 is a section cut from a sheet of paper that has been operated upon by the form of the cutting edge of the punching device shown more clearly in Figs. 3 and 6.

While useful for other purposes when perforations are required to be made in sheets of paper, the main or immediate object of this invention is to provide a suitable device for perforating sheets of paper in a printing-press at predetermined points with relation to the printed pages of the sheets, which perforations are designed to be used in connection with a certain automatic pointing or sheet-registering mechanism now in use and devised by me and for which I shall file an application for Letters Patent of the United States simultaneously herewith. The leading feature of the said pointing mechanism, broadly stated, comprises two or more vibratory conical or pointed pins, which are adapted to enter holes or perforations (previously made in the sheet at predetermined points and on a predetermined line) when the sheet is brought into a position for some part of the said perforations to be within the path of the vibration of the 45 points of the pins by means of suitable conveying, stopping, and side guiding or adjusting mechanism, the sheets being then drawn into the required accurate position for the operation of the folding mechanism by the ac-

tion of the said pins entering the said perforations up to their larger diameter, which is substantially or approximately equal to that of the perforations.

The precise character of my present invention will clearly appear from the following description and claims.

Referring to the accompanying drawings, which illustrate that form of the device that I have up to this time found to be the most desirable, 1 designates a suitable block for holding the punch or cutting device and adjuncts. The punch consists of a cylindrical pin 2, having a sharp cutting edge 3, which, although it may be entirely circular, is in the present instance, for a purpose hereinafter explained, notched out at *x*. The cutting edge is formed by or at the junction of an external taper of the end portion (in the form of a frustum of a cone) and an internal taper of the wall of a conical concavity in the end of the pin, as clearly seen and indicated in Figs. 3, 4, and 6 of the drawings. The body of the pin is screw-threaded and has a longitudinal groove 4, adapted to be engaged by a feather 5, projecting from the side of a hole or socket 6 in block 1, into which the pin is entered, as and for a purpose hereinafter explained.

7 is a threaded nut which is screwed onto the pin and when the parts are together in position rests in a socket 8 in the upper part of the block 1, and the feather enters the groove 4.

The height of the pin above the top of the block 1 may be adjusted, as required, by turning nut 7, which is or may be provided with a slot 9, Fig. 3, for the reception of a suitable screw-driver, the pin being prevented from rotating by the feather 5. As a convenient means for maintaining the nut and pin in place and against rotative displacement I employ a binding-screw 10, that is screwed into the block and whose head projects over upon the top of the nut, as clearly shown. Thus while the screw holds the said parts firmly in place they may be readily removed when necessary by taking out the binding-screw 10.

In using my cutting device for perforating

sheets of paper while being printed in a printing-press—as, for example, a press having a reciprocating type-bed and a rotary-cylinder tympan, such as shown in part in Figs. 1 and

2—I secure the block 1 to the type-bed 11 of the press at the proper prearranged point and position by locking it—the said block—up in the chase with the furniture or by other suitable means. I then adjust the punch vertically by turning the nut 7, first easing up the binding-screw, so that the cutting edge will be a short distance below the plane of the type. As it is necessary that the edge 3 have a body to cut against, I secure to the tympan 12 of the printing-press a counter-plate 13, preferably of brass, that projects a short distance beyond the periphery of the tympan and is located on the tympan at the proper point to register with the punch when the press is operated. The preferred means for thus securing the said plate is to rivet the same to a tape 14 and then paste or glue the latter to the tympan-sheet of the press.

It may sometimes be necessary to change the location of the punch, and consequently of the counter-plate, in the press. By locking up the block 1, in which the former is mounted in the chase with the furniture, as mentioned, and attaching the counter-plate to the tympan-sheet with an adhesive the said changes of location may readily and conveniently be made.

While the cutting edge of the punch will always be somewhat below the plane of the top of the type 15, so that the usual inking-rollers may pass over the punch without being cut thereby or inking the latter and so defacing the sheet when being perforated, the pin may be very nicely adjusted by means of a nut 7, so as to just cut through the paper and yet not materially cut into the counter-plate 13.

By making the cutting edge 3 as described and shown—that is, with walls tapering internally and externally—a strong yet efficient cutting edge is secured that will last a comparatively-long time.

The object of preferably making the cutting edge with the narrow notch or cut-away portion x is to escape an objection that existed in the employment of a continuous cutting edge in perforating sheets of paper preparatory to being folded by a machine in which my aforesaid automatic pointing or sheet-registering mechanism was embodied. This objection was that the free cuttings or punchings would sometimes lodge between the type and the sheet being printed, and thus mar the printing. By notching out the edge the cutting remains as a tongue 16, attached to the sheet by a narrow connection 16^a, as seen in Fig. 7, which figure represents part of the printed sheet 17 that has been operated upon by the punch. Thus while the cutting remains undetached from the sheet it does not

affect the result of the operation of the pin of the before-mentioned registering mechanism, which merely pushes aside the tongue 16 as it enters the opening.

I remark that in Fig. 7 the dotted line $a a$ is the line upon which the sheet of paper is to be folded.

Although I have shown and described the cutting edge of my punch as circular in form, it may be square or of other polygonal outline; but whatever be the outline of the cutting edge it is essential that the line of the tapering sides of the concavity in the end of the punch shall bisect the major axis of the latter.

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

1. A punch for perforating papers or the like, having an externally-tapering end and having a concavity therein the sides of which meet the said end of the punch to form a cutting edge, the line of said sides bisecting the major axis of the punch, substantially as and for the purpose set forth.

2. A punch for cutting circular holes in sheets of paper or the like, whose end is in the form of a frustum of a cone and having a conical concavity therein concentric with said frustum, the sides of which concavity meet the end of the frustum to form a cutting edge, substantially as and for the purpose set forth.

3. In a device of the character and for the purpose set forth, the combination of the block, the screw-threaded punch socketed therein, the nut on said punch, and a binding-screw or the like, for normally maintaining the nut and punch fixedly in position, substantially as and for the purpose described.

4. In a device of the character and for the purpose set forth, the combination of the block, the punch mounted therein, means for adjusting the extent of projection of said cutting edge beyond the surface of the block, and means for preventing rotative shifting of the punch, substantially as described.

5. In a device of the character and for the purpose set forth, the combination with the block, the punch, freely mounted therein and having the notched cutting edge, means for adjusting the extent of projection of said cutting edge above the plane of said block, and the groove and feather for preventing rotation of the punch, substantially as and for the purpose described.

6. In a device of the character and for the purpose recited, the combination of the block, the screw-threaded punch freely mounted therein and having the notched-out cutting edge, the adjusting-nut on said punch, and the groove and feather for preventing rotation of the punch, substantially as specified.

7. In a detachable sheet-perforating device of the character described, adapted for use in

a printing-press, the counter-plate secured to a tape or the like, whereby said plate is adapted to be connected to and readily detached from the tympan-sheet of a printing-press by
5 pasting said tape thereon, substantially as and for the purpose set forth.

In testimony whereof I have hereunto af-

fixed my signature this 4th day of January,
A. D. 1899.

HOWARD K. KING.

Witnesses:

WALTER C. PUSEY,
JOSHUA PUSEY.