June 10, 1941. J. A. CARPENTER 2,244,660

PUNCH

Filed May 18, 1939

Fig. 1.

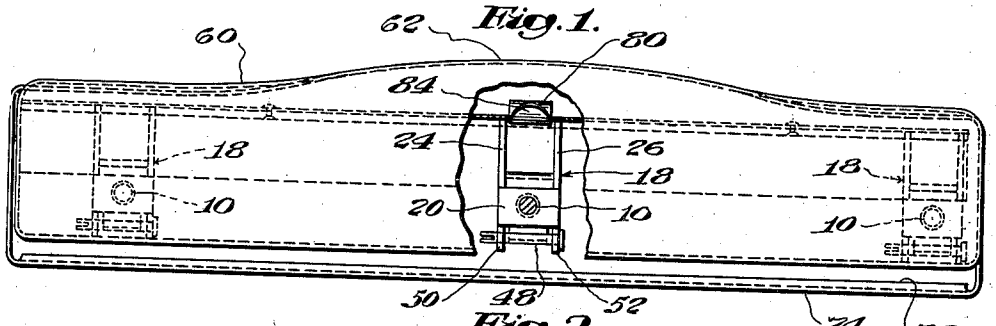


Fig. 2.

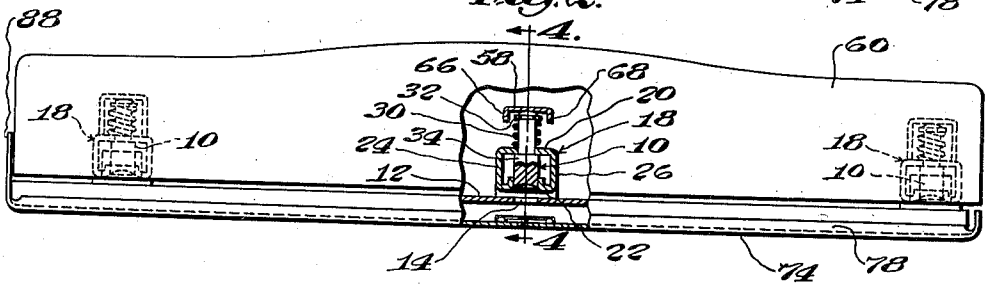


Fig. 3.

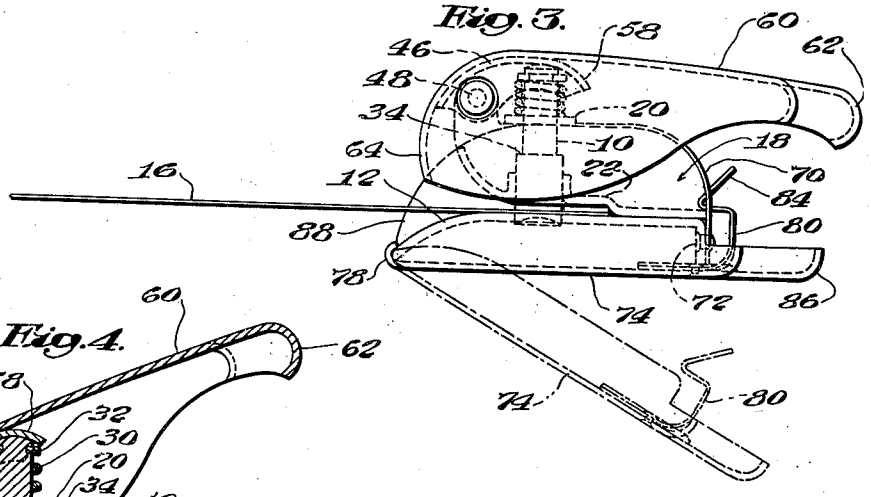
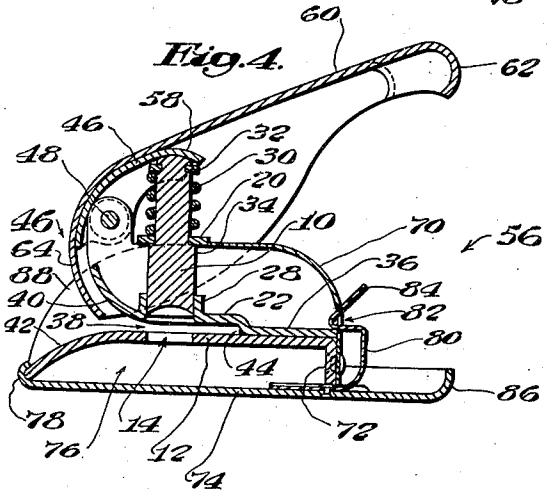


Fig. 4.



Inventor:
John A. Carpenter
By J. Stanley Churchill
Attorney

Patented June 10, 1941 2,244,660

UNITED STATES PATENT OFFICE

2,244,660

PUNCH

John A. Carpenter, West Newton, Mass., assignor to New England Paper Punch Company, Natick, Mass., a corporation of Massachusetts

Application May 18, 1939, Serial No. 274,374

10 Claims. (Cl. 164—91)

This invention relates to a punch particularly adapted for use as a paper punch.

The invention has for an object to provide a novel and superior construction of punch and particularly of a multi-hole punch which is light in weight, simple and efficient in operation and which may be economically manufactured.

With this general object in view and such others as may hereinafter appear, the invention consists in the punch and in the various structures, arrangements and combinations of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawing illustrating the preferred embodiment of the invention, Fig. 1 is a plan view of a multi-hole punch embodying the present invention, the central portion of the housing being broken away; Fig. 2 is a front elevation having a portion of the housing broken away and in cross-section; Fig. 3 is an end view showing the punch in its depressed or operating position; and Fig. 4 is a cross-section on the line 4—4 of Fig. 2 showing the punch in its raised position.

In general, in its preferred form, the present invention contemplates a multi-hole punch particularly adapted for punching a plurality of, and as herein shown, three holes in one or more sheets of paper to prepare such sheets to be inserted into or incorporated with a standard three-ring loose-leaf binder. The present multi-hole punch is designed to permit the punching operation to be easily and conveniently performed while the punch is held and operated in one hand, without resting the punch upon a table or other support. In order to adapt the punch to be operated in such manner, the operating lever or handle is pivotally mounted adjacent the punch members in a manner such as to enable the punching operation to be performed by rocking the operating lever in a direction toward the rear of the device and away from the front or paper inserting end of the punch. In prior multi-hole punches of which I am aware, the parts are so constructed and arranged as to require the operating handle to be rocked toward the front or paper feeding end of the punch. In such a construction, it is necessary to set the punch on a table or other support and to then rock the operating lever toward the operator to perform the punching operation.

Other features of the present multi-hole paper punch includes simplicity of design, relative lightness in weight and rigidity of construction, fewer operating parts and economy of manufacture. Provision is also made in the improved construction for receiving the punched out portions of the paper in a detachable base member which may be quickly and easily removed to dispose of the punched out portions.

Referring now to the drawing, 10 represents the punch members of the present multi-hole paper punch and 12 represents the punch plate provided with holes 14 with which the punch members 10 are arranged to cooperate to punch out holes in one or more sheets of paper 16. In the preferred embodiment of the invention, the punch members 10 are yieldingly supported in punch holders 18 which may be welded or otherwise secured to the top of the punch plate 12. As herein shown, each punch holder comprises an upper guide arm 20 and a lower guide arm 22 joined together by the side walls 24, 26 formed integrally therewith to provide maximum rigidity and stability for the holder. The guide arms are provided with holes through which the punch members are slidingly fitted in vertical alignment with their respective holes in the punch plate 12. The lower arm 22, as herein illustrated, is further provided with a raised or upset portion 28 around the hole extending upwardly from the arm in order to provide a greater bearing surface or guiding area for the punch member 10.

As herein shown, each punch member 10 is arranged to be normally held in its raised position, as illustrated in Fig. 4, by a spring 30 coiled about the upper end of the punch member, one end of the spring bearing against the top of the arm 20 and the other end bearing against a split ring or washer 32 which is fitted into a grooved portion immediately below the upper end of the punch member. Each punch member 10 is further provided with a shouldered portion 34 which bears against the underside of the upper guide arm 20 of the holder 18 in order to limit the upward position of the punch member 10. It will be observed that the lower arm 22 of each punch holder is offset with relation to the base 36 of the holder, in order to provide a space 38 between the arm 22 and the punch plate 12 between which the paper 16 is fed. The forward ends of each member 22 and 12 are flared as at 40, 42, respectively, to provide a mouth portion into which the paper to be punched is guided. The inner edge 44 of the base portion 36 serves as a stop for the edge of the paper 16 to register the latter in the preferred position for punching.

In the illustrated and preferred embodiment of the invention, each punch member 10 is arranged to be depressed by a hinged cam member

46 which is pivotally mounted upon a pin 48 held in spaced arms 50, 52, extending from and forming a part of the side walls 24, 26 of the punch holder 18. As herein shown, the pivotal point 48 of each cam member 46 is disposed at the forward or paper feeding end 54 of the punch and in advance of the punch members 10, so that in operation, the punch members may be depressed by rocking the hinged members in a direction toward the rear 56 of the multi-hole punch. Each hinged member 46 is provided with a curved cam surface 58 arranged to engage the top of its respective punch member 10. The hinged members, as herein shown, may be welded or otherwise secured to an elongated hand lever 60 which is curved outwardly and rounded over at the back end as indicated at 62 in Figs. 1 and 3, in order to provide a convenient shape to be grasped by the hand and to provide sufficient leverage in the operation of the punch. The forward portion of the hand lever is preferably rounded over as at 64 to serve as a shield for the front end of the punch. Each cam member 46 is provided with depending ribs 66, 68 in order to provide maximum rigidity to the members. The rear portion 56 of the punch is provided with a curved back shield 70 which extends throughout the length of the punch and which may be riveted or otherwise secured to the rear vertical wall or turned down edge portion 72 of the punch plate 12.

As herein illustrated, the present punch is provided with a removable or detachable base member 74, arranged to provide a space or depository 76 for the punched out portions of the paper. The front or forward edge of the base member is turned up as at 78 to form a hooked portion adapted to receive the forward edge of the punch plate 12 in order to provide a retaining edge for the base member in its assembled position and to provide a pivotal point about which the base member is swung when the latter is to be attached or detached from the punch. As herein shown, when the base member is in its assembled position, the depending edge 72 of the punch plate rests against the top of the base member 74. In order to retain the base in its assembled relation, a spring steel snap-on member 80 is provided which is secured to the top of the base member and which extends upwardly and inwardly to fit into a depressed or cut-out portion 82 formed in the back shield 70. An angularly extended portion 84 is provided to form a convenient handle by which the snap-on member may be depressed to withdraw the latter from the cut-out or retaining portion 82. In the preferred embodiment of the invention, and as illustrated in Figs. 3 and 4, the inwardly extended portion of the snap-on member rests against the top of the base portion 36 of one of the punch holders 18 in order to yieldingly retain the parts in their assembled relation. Thus it will be seen that the base member 74 together with the punch plate 12 forms a convenient depository for the punched out portions of the paper and the base member may be easily removed to dispose of such portions as illustrated in dotted lines in Fig. 3.

As herein shown, the base member 74 is also provided with an outwardly curved and rounded portion 86 at the back end which may and preferably will correspond to the curved and rounded portion 62 of the hand lever 60 in order to provide a convenient shape to be grasped by the hand of the operator. One end of the base member 74 is provided with an upstanding edge 88 which serves as a guide or stop for one edge of the paper and which together with the edge 44 of the punch holders 18 serves to register the paper in predetermined position for punching.

From the above description of the preferred embodiment of the invention, it will be observed that in the operation of the present device, the operator may grasp the punch in one hand, holding the punch by the curved portions 62, 86, and may insert the paper to be punched with the other hand and by simply pressing the hand lever 60 to rock the latter towards the rear of the device, the hinged cam members 46 operate to depress the punch members 10 to perform the punching operation. As heretofore observed, other multi-hole paper punches of which I am aware are so constructed and arranged as to require pressure of the operating lever in a direction towards the front of the device so that it is necessary to set the punch on a table or other support in order to perform the punching operation. In such a construction the operating lever is necessarily extended over the paper to be punched, thereby obstructing the vision of the operator making it difficult and inconvenient to adjust the material under the handle into position to be punched and requiring an awkward position of the hands when the punching operation is performed.

The present punch may also be operated while being set upon a table or other support, and, when so used, the position of the operating handle is such as to provide unobstructed vision and a more natural position thereby enabling the operator to work more rapidly and with more efficiency than with other types of multi-hole punches.

The present multi-hole punch may be made light in weight, with the major portion constructed of sheet metal, preferably aluminum, which may be stamped out to the required shape, thereby enabling the device to be manufactured economically. Although light in weight, the parts are designed to provide maximum rigidity and structural strength by turning over the edges of the material. The present device employs a minimum number of parts which may be economically manufactured and assembled to produce a punch which is simple in design and convenient and efficient in operation.

For purposes of illustration the invention has been shown and described as embodied in a multi-hole punch, but it will be understood that it may also be embodied in a single hole punch if desired.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. A multi-hole paper punch comprising a plurality of vertically and yieldable supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate and a pivotally mounted cam member having a concave portion directly engageable with the top of each of said yieldable mounted punch members and arranged to depress the latter when rocked in a direction away from the paper receiving end of the punch whereby the punch may be operated while held in the hand.

2. A multi-hole punch comprising a plurality

of yieldingly supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate, a pivotally mounted depressing member arranged to engage said punch members and to depress the latter when rocked in a direction away from the work receiving end of the punch, and a detachable base member arranged to form a depository for the punched out portions of the paper, said detachable base member being arranged to hook over the forward end of said punch plate and provided with a snap or clip engageable with the top of said punch plate at the rear end thereof to yieldingly and detachably lock said base in position.

3. A multi-hole punch comprising a plurality of yieldingly supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate, a pivotally mounted operating lever, and connections between the latter and said punch members adapted to depress said punch members when said operating handle is rocked in a direction away from the work receiving end of the punch, and a detachable base member arranged to form a depository for the punched out portions of the paper, said operating lever and said base member each being provided with corresponding outwardly curved portions at the back end thereof adapted to be engaged by the hand for operating the punch.

4. A multi-hole paper punch comprising a plurality of yieldably supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate, operating means for depressing said punch members into operative engagement with said punch plate comprising a plurality of pivotally mounted individual cam members, one for each punch, each cam member having a concave portion directly engageable with the top of its respective punch member and an operating handle to which said cam members are secured, said cam members being arranged to depress their respective punch members when said operating handle is rocked in a direction away from the paper receiving end of the punch.

5. A multi-hole punch comprising a plurality of yieldably supported punch members, a plurality of individual supporting members in which said punch members are individually supported, a punch plate having a plurality of holes with which said punch members are arranged to cooperate and upon which said individual supporting members are mounted, a plurality of pivotally mounted cam members supported in said individual supporting members, each cam member having a concave portion directly engageable with the top of its respective punch member and an operating handle to which said cam members are secured, said cam members being arranged to depress their respective punch members when said operating handle is rocked in a direction away from the paper receiving end of the punch.

6. A multi-hole paper punch comprising a plurality of vertically and yieldably supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate and operating means for depressing said punch members into operative engagement with said punch plate comprising a hinged cam member having its pivotal point disposed adjacent the paper receiving end of the punch in advance of and below the top of said punch members, said cam member having a concave portion directly engageable with the top of each of said yieldably supported punch members, and an operating handle to which said cam member is secured whereby the punch members may be depressed when said operating handle is rocked in a direction away from the paper receiving end of the punch.

7. A multi-hole paper punch comprising a plurality of vertically and yieldably supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate and operating means for depressing said punch members into operative engagement with said punch plate comprising a hinged cam member having its pivotal point disposed adjacent the paper receiving end of the punch in advance of and below the top of said punch members, said cam member having a concave portion engageable with the top of each of said yieldably supported punch members, and an operating handle to which said cam member is secured whereby the punch members may be depressed when said operating handle is rocked in a direction away from the paper receiving end of the punch, said operating handle being curved at its forward end to form a shield for said yieldably supported punch members and said operating means.

8. A multi-hole paper punch comprising a plurality of yieldably supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate, operating means for depressing said punch members into operative engagement with said punch plate comprising a plurality of pivotally mounted individual cam members, one for each punch, each cam member having a concave portion engageable with the top of its respective punch member and an operating handle to which said cam members are secured, said cam members being arranged to depress their respective punch members when said operating handle is rocked in a direction away from the paper receiving end of the punch, said operating handle being curved at its forward end to form a shield for said yieldably supported punch members and said operating means.

9. A multi-hole punch comprising a plurality of vertically supported punch members, a punch plate having a plurality of holes with which said punch members are arranged to cooperate, and a pivotally mounted operating handle arranged to engage said punch members to perform the punching operation, said handle comprising an elongated member being curved downwardly at its forward end and having depending side walls whereby to form a shield within which said vertically supported punch members are located.

10. A multi-hole punch comprising a plurality of yieldably supported punch members, a punch plate having a plurality of holes with which said punch members are adapted to cooperate, and operating means for depressing said punch members to perform the punching operation including a pivotally mounted operating handle comprising an elongated member being curved downwardly at its forward end and having depending side walls, the rear edge of said member being also downwardly curved whereby to form a shield for said yieldingly supported punch members and said operating means.

JOHN A. CARPENTER.