

G. C. AINSWORTH.  
Punches.

No. 216,992.

Patented July 1, 1879.

Fig. 1.

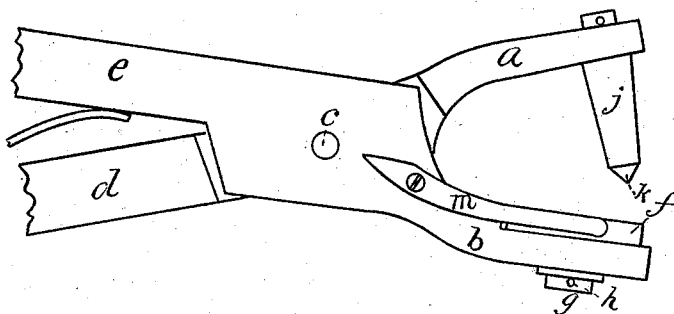


Fig. 2.

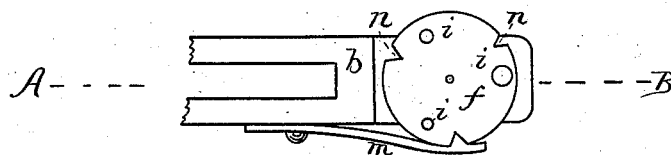
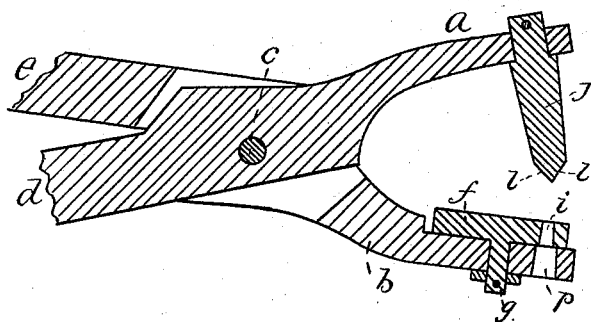


Fig. 3.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN PUNCHES.

Specification forming part of Letters Patent No. **216,992**, dated July 1, 1879; application filed July 5, 1878.

*To all whom it may concern:*

Be it known that I, GEORGE C. AINSWORTH, of Boston, State of Massachusetts, have invented Improvements in Punches, of which the following is a specification.

This invention relates more particularly to that class of hand-punches which are formed with two handles or members pivoted together and terminating in jaws in which are secured the punching devices; and the invention consists in the combination of a suitable perforated female die and a solid male punch, having a diameter greater than the hole in the die, and formed with a conical point, whose faces are at an angle of about forty-five degrees with the axial line of the punch.

It also consists in combining with such male punch a centrally-pivoted die, constructed and arranged to be rotated and locked in position, and formed with a series of varying-sized holes arranged around such center, whereby holes of various sizes may be punched with the same punch.

Figure 1 is a side elevation, showing a hand-punch with my invention, the handles being broken away. Fig. 2 is a top or plan view of the lower jaw, the die, and locking-spring. Fig. 3 is a longitudinal vertical section as taken on line A B, Fig. 2.

In these drawings, *a* is the upper and *b* the lower jaw, *d* showing the continuation of the handle of the former, and *e* that of the latter, said parts being formed (and united by the rivet *c*) in the usual manner.

*f* is the rotary die, which is pivoted in jaw *b* by the stem *g*, as shown in Fig. 3, the pin *h* holding the die in place. In this die, and near its periphery, at a uniform distance from its pivotal center, a series of varying-sized holes, *i*, are formed, as shown in Fig. 2, the diameter of the largest of these holes being less than that of punch *j* at the base of the conical point *k*; and there may be as many of these holes as the space will admit or the various sizes of the holes to be punched may demand.

In the periphery of the die as many indentations (shown at *n*) are formed as there are holes *i*. The spring *m*, which is attached to jaw *b*, is formed with a projection, as shown in Fig. 2, which engages in notches *n*, thereby secur-

ing the die from rotation when the punch is being used; and by the proper location of these notches relative to holes *i*, either of the latter may be instantly adjusted to coact with punch *j*. This punch is formed solid and preferably with a slightly-tapering cylindrical body, terminating at its lower extremity in the conical point *k*, the angles *l l* of which are nearly at right angles to each other and at about forty-five degrees with the axis of the body of the punch.

When any substance to be cut is placed upon die *f* and punch *j* is forced down upon it, the point depresses such substance until the faces *l*, acting against the right angle formed by hole *i* and the face of the die, cuts out a circular piece of a diameter proportioned to that of the hole so coacting with punch *j*. The disks so cut fall through hole *p* in jaw *b*.

This invention is peculiarly adapted to cutting sheet-rubber, as, unlike other punches, it easily cuts a clean smooth hole of any desired size. It is also of great utility in cutting paper and textile fabrics of various thicknesses.

I am aware that punches in which the die-block is provided with a hole in which the male die or punch just fits, or entering free into the die or block, are old, and such I do not desire to claim as my invention; but

I claim as my invention—

1. In a punch, the female die *f*, having a level face or upper surface, and a hole, *i*, at right angles thereto, a delivery-passage, *p*, for the passage of the clippings through the die and the jaw *b*, and the male die or plunger *j*, having a diameter greater than the hole *i* in die *f*, and having a conical point, *k*, and arranged, relatively to the die *f*, substantially as specified.

2. In a hand or punching press, in combination with the male punch *j*, formed with a conical point, the laterally-rotating disk *f*, having a plurality of varying-sized holes, *i*, and arranged to be adjusted and locked relatively to the male die, substantially as and for the purposes specified.

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Witnesses:

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