Dec. 1, 1925. 1,563,574

J. JENSEN

HOLLOW PUNCH

Filed Sept. 4, 1923

Fig. 1.

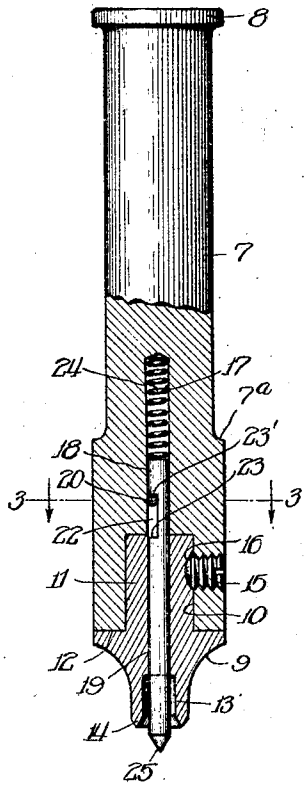


Fig. 5.

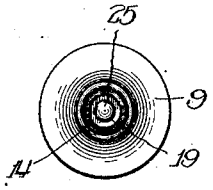


Fig. 6.

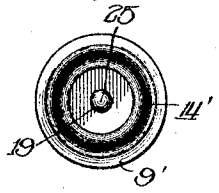


Fig. 2.

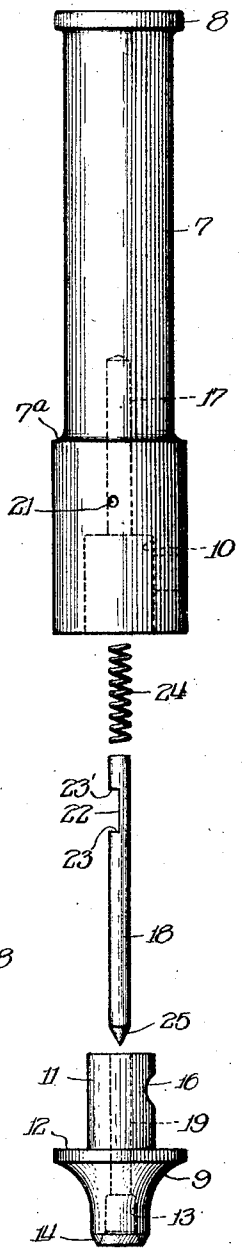


Fig. 3.

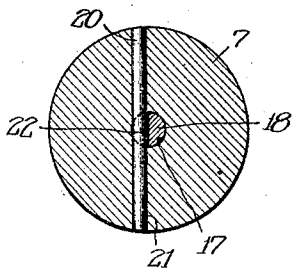
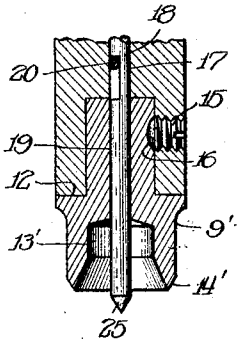


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN JENSEN, OF ROCKFORD, ILLINOIS, ASSIGNOR TO WHITNEY METAL TOOL COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

HOLLOW PUNCH.

Application filed September 4, 1923. Serial No. 660,702.

To all whom it may concern:

Be it known that I, JOHN JENSEN, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented a certain new and useful Hollow Punch, of which the following is a specification.

The invention pertains to tools of the type commonly known as hollow punches, and the object of the invention is to provide a punch of this type having a centering pin and at the same time constructed with a detachable cutting bit or tool so that a set of such tools of varying sizes may be used interchangeably in a common shank or holder.

I have illustrated in the accompanying drawings a preferred form of my invention.

Figure 1 is an elevation section of a tool constructed in accordance with the invention.

Fig. 2 is a side elevational view showing the several parts in detached relation and arranged in the order in which they are assembled.

Fig. 3 is a horizontal sectional view on a somewhat enlarged scale, taken in the plane of line 3—3 of Fig. 1.

Fig. 4 is a fragmentary vertical sectional view showing a larger cutting tool in position in the shank or holder.

Figs. 5 and 6 are lower end views of Figs 1 and 4 respectively.

The punch comprises a shank 7 having at its upper end a head 8 to receive the blows of a hammer. The lower end of the shank is constructed so as to form a holder for the cutting tools or bits to be used interchangeably, one of said bits being indicated in Fig. 1 by the numeral 9 and another one of said bits being indicated in Fig. 4 by the numeral 9′.

In thus constructing the lower end of the shank to form the holder for the bits 9—9′ I provide an axial socket 10 in the lower end portion of the shank, and the latter, it will be observed, is somewhat enlarged, as shown at 7^a (Fig. 1).

Said socket 10 is adapted to receive the upper end portion of the cutting tool or bit which for this purpose has its upper end shaped to form a stem 11 adapted to fit snugly in the socket with its upper end abutting the inner end wall of the socket. At the lower end of the stem 11 the bit is enlarged radially outwardly, to a diameter substantially equal to that of the lower end of the shank, to provide a shoulder 12 adapted to engage with the extreme lower end of the shank and thus coact with the upper end of the stem in receiving the force of the blow.

The cutting tool or bit is bored out, axially thereof at its lower end, as shown at 13 (Fig. 1) and 13′ (Fig. 4) and the extreme lower end of the bit is then shaped to form an annular cutting edge 14 or 14′.

In order detachably to secure the cutting tool or bit in its holder, I preferably provide a set screw 15 entered through a threaded aperture in one wall of the socket 10 and adapted to engage with a recess 16 in the peripheral wall of the stem 11.

To provide the punch with a centering pin I bore the lower end of the shank 7 axially thereof as at 17 to a diameter adapted to receive the upper end of a pin indicated at 18. Likewise I bore the tool or bit axially thereof as indicated at 19 so that the pin may pass through the cutting tool and into the shank, the lower end portion of the pin being concentric with the annular cutting edge 14. The pin may be secured in the shank in any suitable way, but preferably I employ a key-pin 20 entered through a transverse hole 21 near the lower end of the shank (Fig. 3), this pin being offset slightly from the axis of the shank so as to lie within a cut-away portion or notch 22 in the side of the pin near its upper end. The notch 22 provides shoulders 23 and 23′ which are adapted to engage with the key-pin 20 to limit the longitudinal sliding movements of the centering pin 18. Normally the pin 18 is held in its lowermost position with the upper shoulder 23′ against the stop pin 20, by means of a coiled expansion spring 24 entered in the upper end of the bore 17. The lower end of the centering pin is sharpened to a point as at 25.

It will be observed that the centering pin is carried by the shank in such a way as to yield under pressure applied to the lower end. At the same time the cutting tools or bits are capable of being quickly and easily interchanged. Moreover, it will be observed that while the cutting tools or bits are thus made separately from the shank or holder, the combined abutting surfaces provided by the shoulder 12 and the upper end of the stem 11 are substantially equal to the cross

sectional area of the shank at its lower end, so that the force of the blow is transmitted to the cutting tool just as effectively as though the two were made an integral part of the shank.

I claim as my invention:

1. A hollow punch comprising a main body portion providing a shank the upper end of which is arranged to receive the impact of a hammer, a cutting tool formed separately from the body portion and shaped to provide an annular cutting edge at its lower end, the lower end of the shank having a socket formed therein and the cutting tool having at its upper end a portion of reduced diameter forming a stem adapted snugly to fit in said socket, there being opposed annular shoulders on the shank and the tool, a screw for fastening the parts rigidly together with said annular shoulders abutting, a centering pin, said shank and cutting tool having alined axial bores adapted to receive said pin, a spring entered in the upper end of the bore in the shank tending to force the pin downwardly, and means carried by said shank to retain said pin in the shank and to limit the downward movement thereof.

2. A hollow punch comprising a main body portion providing a shank, the upper end of which is arranged to receive the impact of a hammer, the lower end of the shank having a socket formed therein thereby providing an annular shoulder at the bottom of the shank, said shank having also an axial bore extending upwardly from the base of said socket, a centering pin extending into said bore, a pin carried by said shank engaging a notch in said centering pin to retain the pin in the shank and to limit its outward movement, a spring in said bore above said pin tending to keep the pin in its outward position, a cutting tool having at its upper end a portion of reduced diameter forming a stem adapted to fit snugly in said socket, said tool having an axial bore to permit passage of said centering pin therethrough and an annular shoulder adapted to fit against the shoulder on the shank, and a set screw entered in said shank through the wall of the socket adapted to engage the stem of said tool to fasten the shank and tool rigidly together with said annular shoulders abutting.

In testimony whereof, I have hereunto affixed my signature.

JOHN JENSEN.