G. J. MILLER.

SELF CENTERING PUNCH.

APPLICATION FILED MAY 19, 1916.

1,225,265.

Patented May 8, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

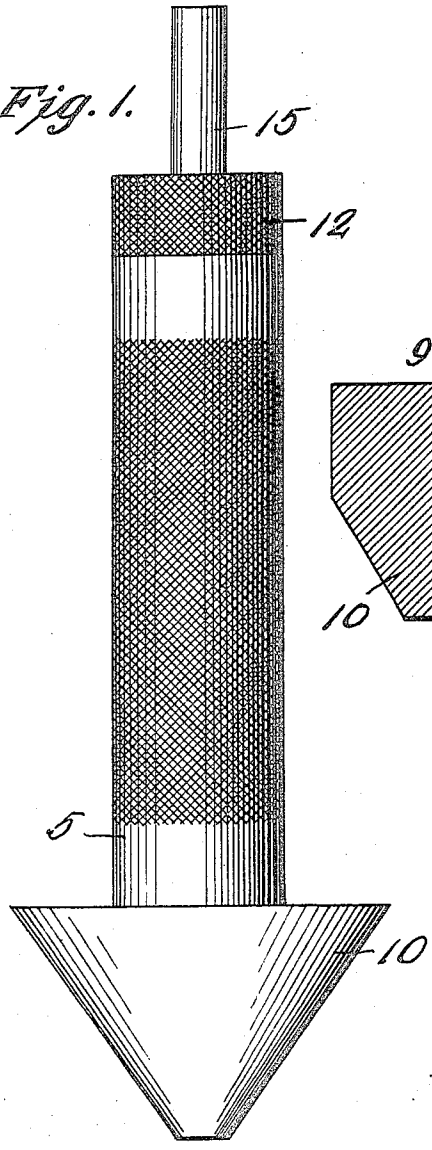


Fig. 3.

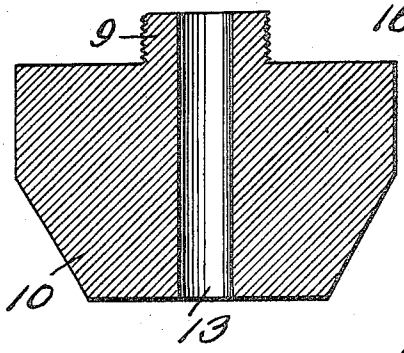


Fig. 2.

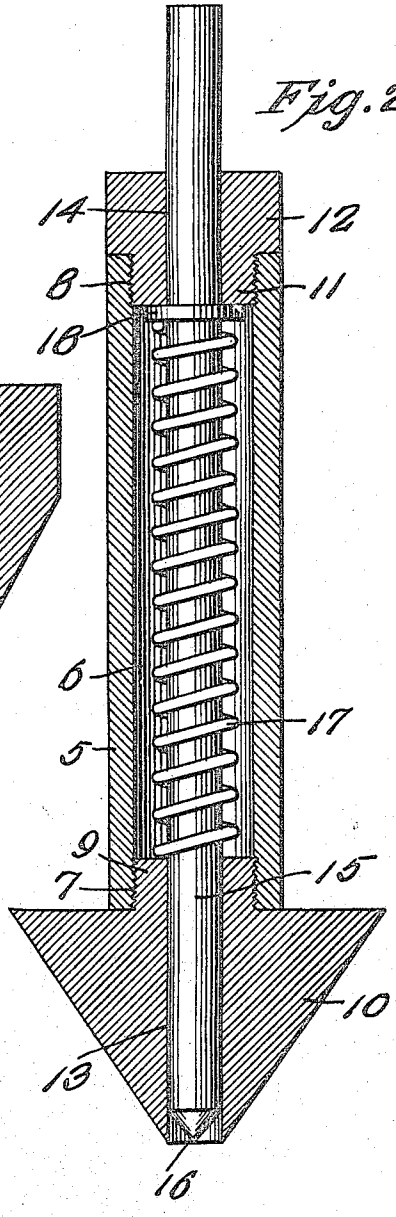
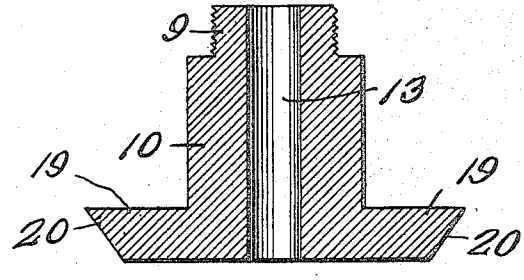


Fig. 4.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5

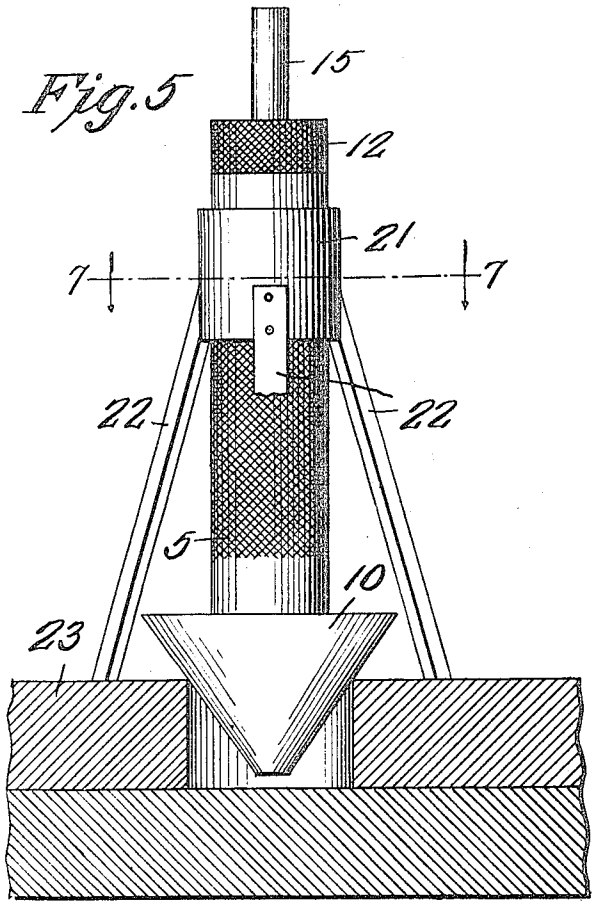


Fig. 6.

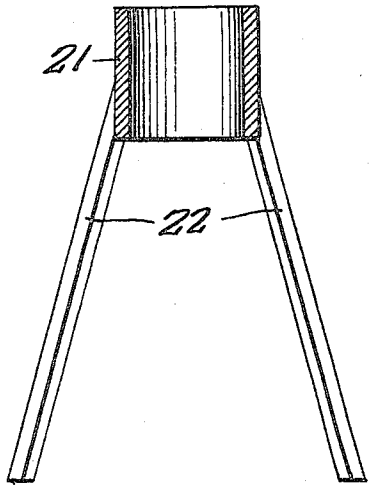
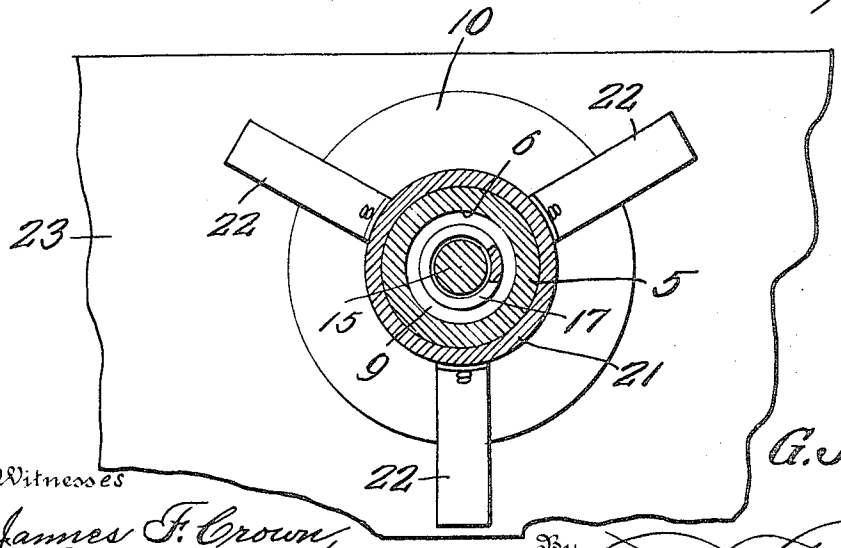


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

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SELF-CENTERING PUNCH.

1,225,265. Specification of Letters Patent. Patented May 8, 1917.

Application filed May 19, 1916. Serial No. 98,634.

To all whom it may concern:

Be it known that I, GEORGE J. MILLER, a citizen of the United States, residing at Winnebago, in the county of Faribault, State of Minnesota, have invented certain new and useful Improvements in Self-Centering Punches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to punch markers, and has for its primary object to provide a simple and improved device for transferring the centers or dimensions of apertures in one piece of material upon others in such manner that such apertures or openings may be exactly duplicated or reproduced in the article or material operated upon.

A further object of the invention is to provide a device of this character which automatically centers itself, and whereby the use of the same will greatly facilitate the operation of correctly reproducing the apertures in one material upon that of another.

A still further object of the invention is to provide a centering punch or marker of the character described which may with facility be used in transferring apertures from a pattern sheet to the material to be operated upon.

A still further object of the invention is to provide a centering tool of this character which is composed of such parts as to enable the same to be readily turned upon a machine.

A still further object of the invention is to provide a device of this character which is of extremely simple and inexpensive construction, which is so arranged and constructed as to automatically center itself when positioned within an opening, which is composed of but few readily assembled parts, all so arranged as to preclude wear, breakage, or derangement of the same, and which will prove thoroughly efficient in the attainment of the ends for which it is designed.

With these objects in view, together with others which will appear as the description proceeds, the invention resides in the novel combination and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawings and particularly pointed out in the claims.

The invention will be best understood by reference to the accompanying drawings, wherein:

Figure 1, is a side elevation of a centering tool embodying my invention,

Fig. 2, is a longitudinal sectional view taken through the improved centering tool and illustrating the same in use,

Figs. 3 and 4 are longitudinal sectional views taken through heads of various sizes and shapes arranged for use in connection with the tool,

Fig. 5 is a side elevation, partly in section, of my invention in use with an attachment,

Fig. 6 is a vertical section of the attachment, and,

Fig. 7 is a section on line 7—7 of Fig. 5.

In the preferred embodiment of the invention, use is made of a shank 5 having a central longitudinally disposed bore 6, the said shank being formed of metal and is of a size to be conveniently gripped or held by the hand. The inner walls of the shank adjacent the opposite ends thereof are threaded as at 7 and 8, the threads 7 being adapted to be engaged by threads formed upon the exterior of a boss 9 projecting rearwardly from a centering head 10. The threads 8 receive threads upon a boss 11 formed upon a cap member 12, the said head and cap member being provided with openings 13 and 14 respectively, the said openings extending entirely through the head and cap member and communicating at their ends with the bore 6 of the shank. A punch member 15 is arranged within the shank for sliding movement longitudinally thereof, the said punch being of a size to slide within the openings 13 and 14 of the head and cap member, and is pointed as at 16 at its cutting end as shown. The punch member is held within the shank with its cutting end normally retracted or inclosed by the head 10, an expansion spring 17 being used to accomplish this end. This spring encircles the punch tang, and rests at one end against the boss 9 of the head, and at its opposite end upon a collar 18 forming a shoulder se-

cured to the punch tang. This collar is positioned upon the punch in such manner as to form a stop to limit the retracting movement of the punch member, the said collar engaging with the boss 11 upon the cap member 12 when the said punch stem is retracted. It will be observed that when retracted, the rear end of the punch tang protrudes from the cap member, and upon force being applied to the said protruding end, the sharpened end 16 of the punch will be caused to project from the head 10.

The head shown in Figs. 1 and 2 of the drawings is of substantially cone shape, the opening 13 therein communicating at one end with the apex of the cone, and at its opposite end with the central portion of the base thereof. It will be observed that upon insertion of the cone shape head within an opening, the inclined walls of the said head will cause the apex thereof to be disposed centrally of the opening, and operation of the punch will mark the exact center of the opening. In tracing or reproducing apertures of such large diameters as to preclude the proper centering of the cone shaped head therein, heads such as are shown in Figs. 3 and 4 of the drawing may be employed. These heads are provided with the exteriorly threaded bosses 9 for engagement within the shank ends, and may vary in diameter and construction at their point of engagement within the apertures. The head shown in Fig. 3 of the drawings is of substantially frusto-conical shape, and it is obvious that relatively large apertures, or apertures in relatively thin material, may be properly centered by the use of this head. The head shown in Fig. 4 of the drawings presents at its outer extremity a flange 19, the edges of which are beveled as at 20, the said head being adapted particularly for use in centering apertures arranged in thin material.

By the construction set forth it is apparent that an extremely simple and inexpensive tool is provided, and one of such construction as will be capable of accomplishing its ends in an extremely simple manner. The various heads are all provided with exteriorly threaded bosses of the same dimensions, whereby the said heads are readily interchangeable, and when arranged on the shank will be rigidly held thereby. The exterior of the shank may be ribbed or milled as shown to enable the same to be securely gripped and held by the hand.

In Figs. 5, 6 and 7, I have shown a device which is to be used in connection with my invention for insuring an absolutely accurate centering of the punch. A cylinder 21 has its interior cut out to closely, but slidably fit the shank of the punch, so that the latter may be vertically moved therein. The cylinder 21 is provided with legs 22, preferably three in number, which support the cylinder above the surface 23 of the material which is being used as a pattern. In using the attachment, the shank is shoved into the cylinder 21 from the bottom, and the legs 22 then placed on the surface 23 with the head 10 in the pattern opening. Since the shank 5 fits the cylinder 21 snugly, the head 10 cannot be canted to one side, when its point is inserted in the pattern opening, so that the member 15 must stand absolutely vertical and can only hit an accurate and true center.

While I have herein shown and described a particular or preferred embodiment of the invention, I wish it to be understood that I need not confine myself to all the precise details of construction herein set forth by way of illustration as modification and variation may be made without departing from the spirit of the invention or exceeding the scope of the claims.

What is claimed is:

1. In a centering punch, a hollow shank, threads at the ends of said shank, a cap engaged with the threads at one end of said shank, and a head engaged with the threads at the opposite end of said shank, the said head and cap being provided with openings communicating with the interior of said shank, a punch slidably arranged within said shank and adapted to have its sharpened end projected from said head the stem of the punch extending above the cap in all positions of the punch, a collar on said punch, and a spring within said shank engaged with said collar for normally holding said punch retracted, substantially as described.

2. In a centering punch, a hollow shank having threads upon its interior walls at the ends thereof, a cap of substantially the same diameter as said shank, a boss projecting from said cap and having exterior threads for engagement with the threads at one end of said shank, the said cap being provided with an opening communicating with the interior of said shank, a head, a boss projecting from said head and having exterior threads thereon for engagement with the threads at the opposite end of said shank, the said head having inclined exterior walls, and the head being provided with an aperture communicating with the interior of said shank, a drill extending through said shank and resting in the openings in said head and cap, a collar on said drill and a coil spring interposed between said boss and said collar for holding the latter engaged with the cap boss and with one end of said drill projecting at all times beyond said cap, substantially as described.

3. In a centering punch, a shank having a tapered head at one end adapted to seat in a circular cavity, and having a central

bore extending therethrough, a punch arranged to slide within said bore and adapted to have its point projected beyond said tapered head the upper end of the punch extending beyond the shank at all times, means for normally holding said punch retracted within the head, and means for supporting said shank in axial alinement with the cavity, consisting of an open-ended cylinder for slidably receiving the shank and a plurality of legs carrying said cylinder.

In testimony whereof, I affix my signature, in the presence of two witnesses.

GEORGE JOHN MILLER.

Witnesses:
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G. A. BASSETT.