

No. 891,516.

PATENTED JUNE 23, 1908.

E. K. ABERY.
METAL PUNCH.
APPLICATION FILED JAN. 13, 1908.

Fig. I.

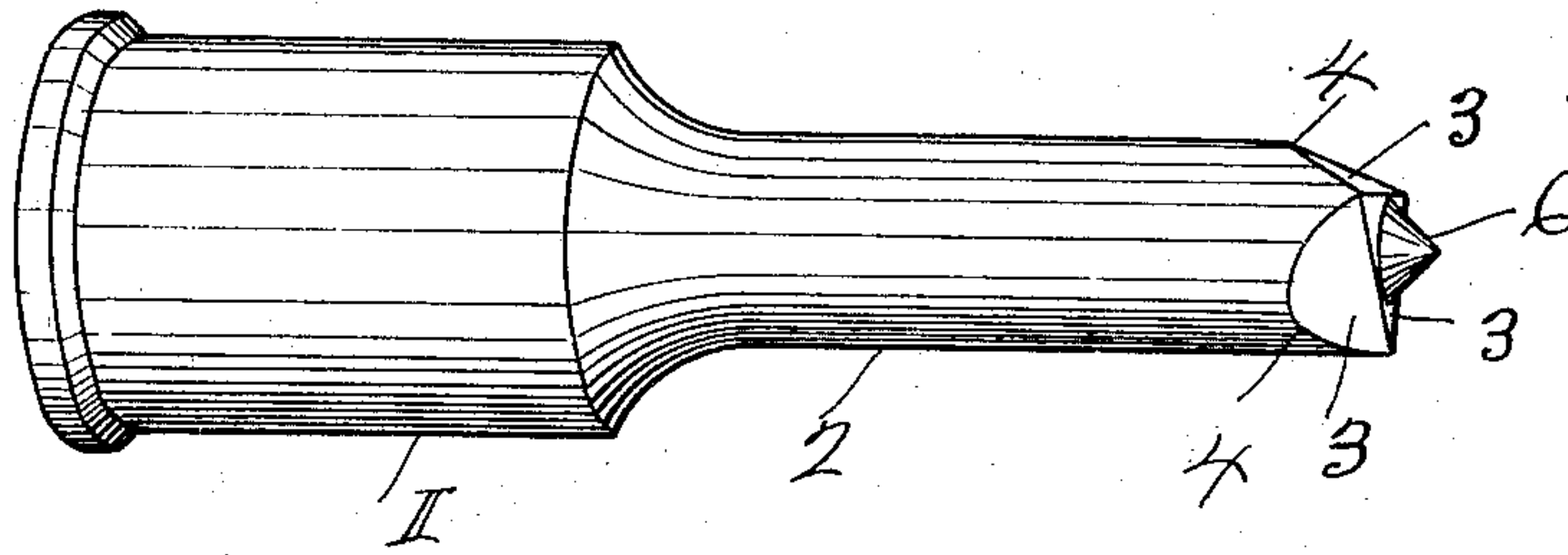


Fig. 2.

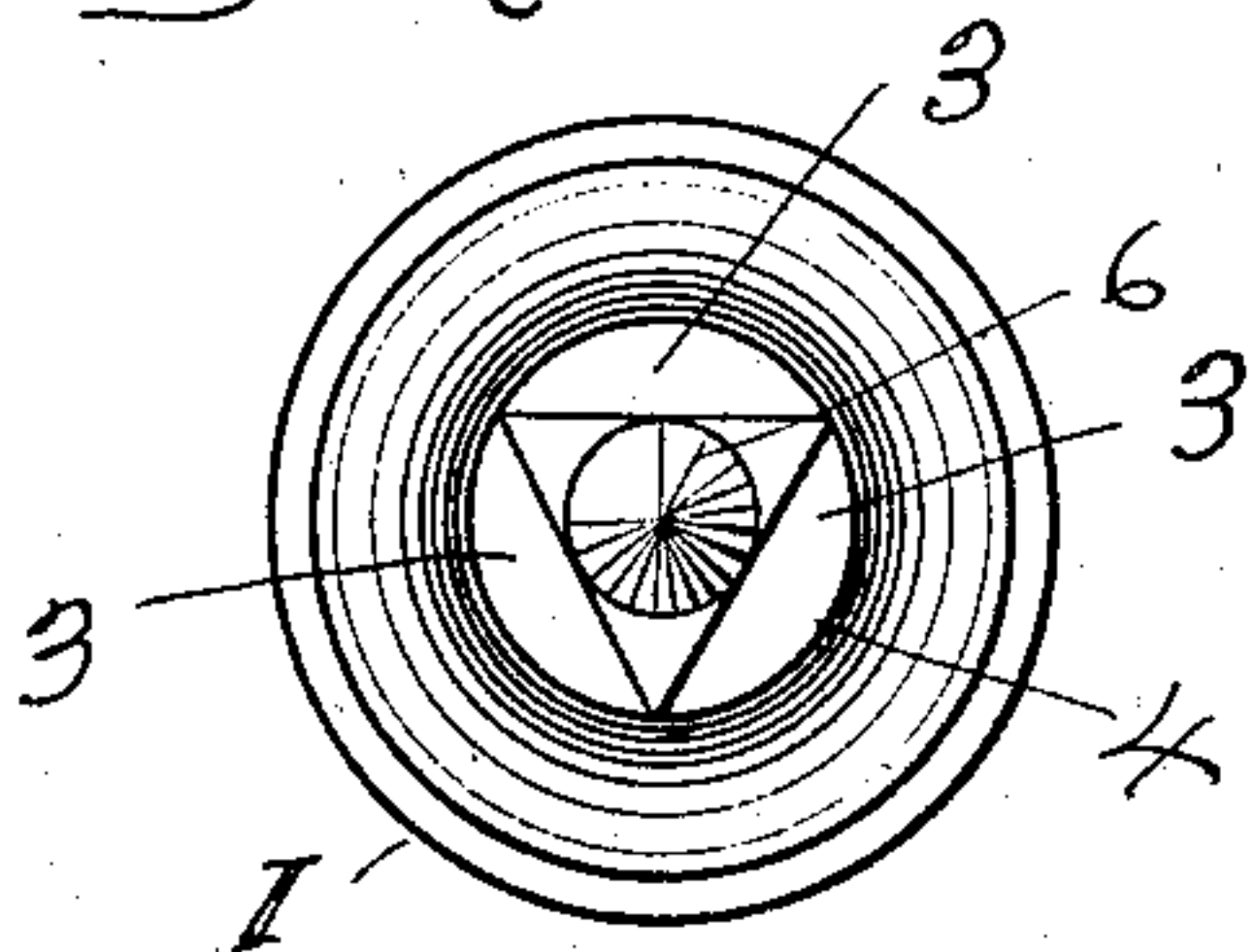


Fig. 3.

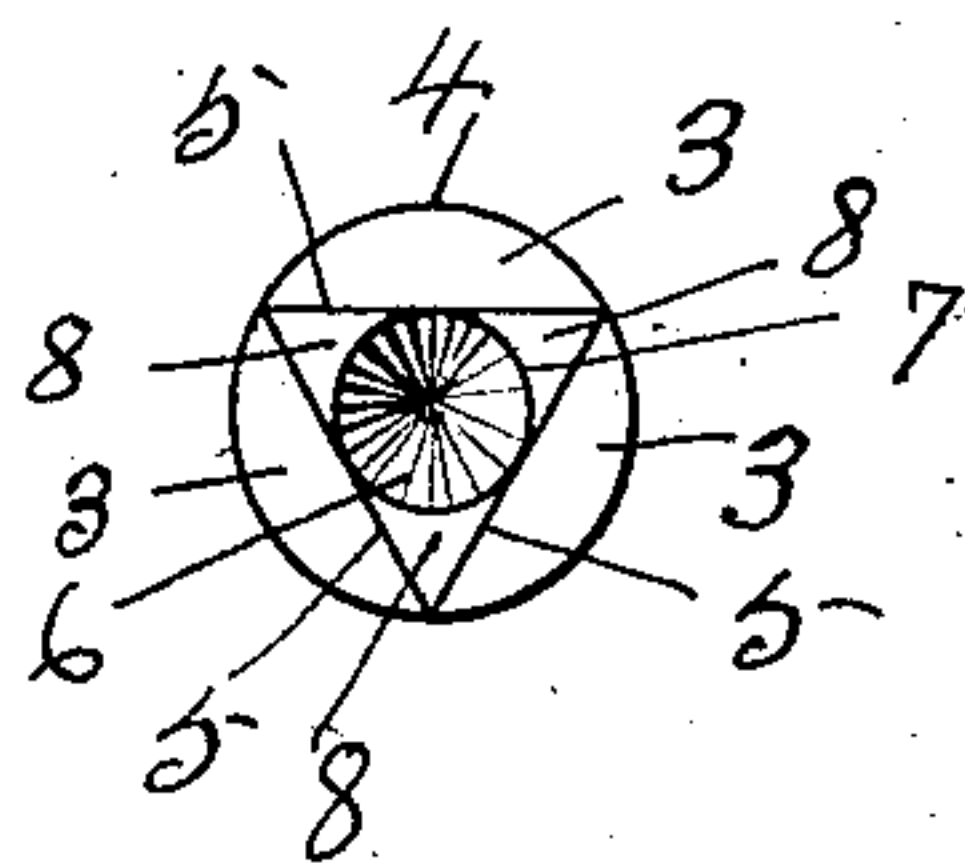


Fig. 4.



WITNESSES:

Augusta Viberg.
Auguste Spiegel.

Edward K. Abery INVENTOR.

BY *Chapin & Denny*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

EDWARD K. ABERY, OF FORT WAYNE, INDIANA.

METAL-PUNCH.

No. 891,516.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed January 13, 1908. Serial No. 410,517.

To all whom it may concern:

Be it known that I, EDWARD K. ABERY, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Metal-Punches; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in metal punches.

It is well known that in the use of punches for rolled steel, boiler plates or other sheet metal, considerable power is required in their operation, and the consequent jar and strain upon the machinery of the punching press, and the wear and tear upon the punch itself is very great, and that, therefore, it is desirable to reduce to a minimum the resistance to the cutting face of the punch, while at the same time preserving a construction thereof which will effect a perfect severance of the portion of the plate to be removed by the punch, and leave a hole with clean cut sides.

The object, therefore, of my present invention is to provide an improved metal punch of economical construction having a novel form of cutting or working end having a plurality of coacting bending, scale breaking and metal cutting edges adapted to successively reduce the resistance of the punch to its succeeding cutting edge, thereby materially reducing the power required in its operation, as well as a material reduction in the noise, jars and racking strains incident to its operation, and at the same time avoids injury to the texture of the metal through which it passes.

My invention consists of a metal punch having a cylindrical body whose operating end is provided with a centrally conical projection at whose base are arranged the apexes of an equilateral triangle whose respective sides coincide at one point with the perimeter of the base of the said conical projection, and form a plurality of cutting edges which are joined to a corresponding series of scalloped peripheral cutting edges by corresponding beveled faces.

The principal novel feature of my invention resides in construction and arrangement

of the triangular cutting edges and their co-operative relation with the conical projection and the second coacting series of cutting edges.

Similar reference numerals indicate like parts in the several views of the drawings in which

Figure 1 is a perspective view of my invention showing the relative arrangement of the coacting parts. Fig. 2 is a front end view of the same showing all the cutting edges and their relation to the conical projection, or centering point. Fig. 3 is a detail end view of the same showing only the centering point and the triangular and the circumferential cutting edges. Fig. 4 is a side view of a piece of metal removed by my invention, partly broken away to show the conical recess therein.

My improved punch has a common cylindrical body portion 1 adapted to be attached to the movable head of any proper punching press, by the usual or other proper means. This body portion preferably has its forward and operative end 2 reduced in cross-section and provided upon its free end with the cutting means which are described as follows: The free end of the portion 2 of the punch is provided with three substantially equal beveled faces 3 whose upper scalloped edges 4 form circumferential cutting edges which determine the size of the hole made by the punch. The outer meeting edges of these beveled faces 3 form a triangle whose sides are advance cutting edges 5. From the center of this triangle rises a conical projection or centering point 6 of proper height whose base line 7 substantially coincides with each of the edges 5 at the middle of their length, as shown in Figs. 2 and 3. This arrangement of the centering point 6 divides the said triangle into three equal parts 8 which are relatively and actually of so small an area as to present but slight resistance in action and yet prove by actual use to be reliably efficient in removing the central portion of the material from the space to be punched, as shown in Fig. 4.

The operation of my invention thus described is obvious and briefly stated is as follows: In action the advance conical projection 6 serves to bend the metal into a conical cavity at the center of the part to be punched out before receiving the action of the cutting edges 5, thereby breaking the scale and rendering the cutting of the metal by these edges

5 easier. The action of the cutting edges 5
serve still further to break the scale upon the
surface of the material, leaving the softer
metal exposed to the action of the larger or
5 circumferential cutting edges 4 of the punch,
thereby materially lessening the power re-
quired to drive these cutting edges through
the material, as the detached surrounding
portions afford much less resistance to these
10 edges which determine the diameter of the
hole.

As the resistance to the cutting edges are
very materially diminished by dividing the
flat portion of the operating face into three
15 small triangular sections preceded in action
by a conical point and provided upon two
sides thereof with cutting edges, and suc-
ceeded in action by the peripheral beveled
faces 3 and the cutting edges 4, no appreciable
20 material is torn away from the under side of
the hole leaving it perfectly cylindrical and
clean cut.

Thorough experimental tests of my inven-
tion prove that it is efficient and reliable in
25 action; is adapted by means of the arrange-
ment of the triangular faces and cutting edges
to divide the resistance thereon without sac-
rificing its strength for use in thick or heavy
iron; leaves the sides of the metal in which
30 it operates smooth around the hole its entire
depth; does not injure the texture of the

metal through which it passes; can be oper-
ated with a minimum of power, noise and
jarring strains; and is durable under the
most severe conditions of service.

Having thus described my invention and
the manner of employing the same what I
desire to secure by Letters Patent is:

1. A metal punch whose working end is
provided with a conical centering point, and
40 a plurality of transverse cutting edges in tri-
angular transverse relation, and a corre-
sponding series of beveled faces whose inner
ends form scalloped peripheral cutting edges,
substantially as described.

2. A cylindrical metal punch whose work-
ing end has a plurality of beveled faces pro-
vided with peripheral cutting edges, and a
triangular base whose sides form cutting
edges, and a centering conical point so ar-
50 ranged on the base as to divide the same into
substantially equal triangular areas to dis-
tribute the resistance in action, all substan-
tially as described.

Signed by me at Fort Wayne, Allen county, 55
State of Indiana, this 9th day of January,
A. D. 1908.

EDWARD K. ABERY.

Witnesses:

AUGUSTA VIBERG,
AUGUSTE SPIEGEL.