

(No Model.)

G. H. WOODS & W. R. BROWN.
PUNCH.

No. 581,875.

Patented May 4, 1897.

Fig. 1.

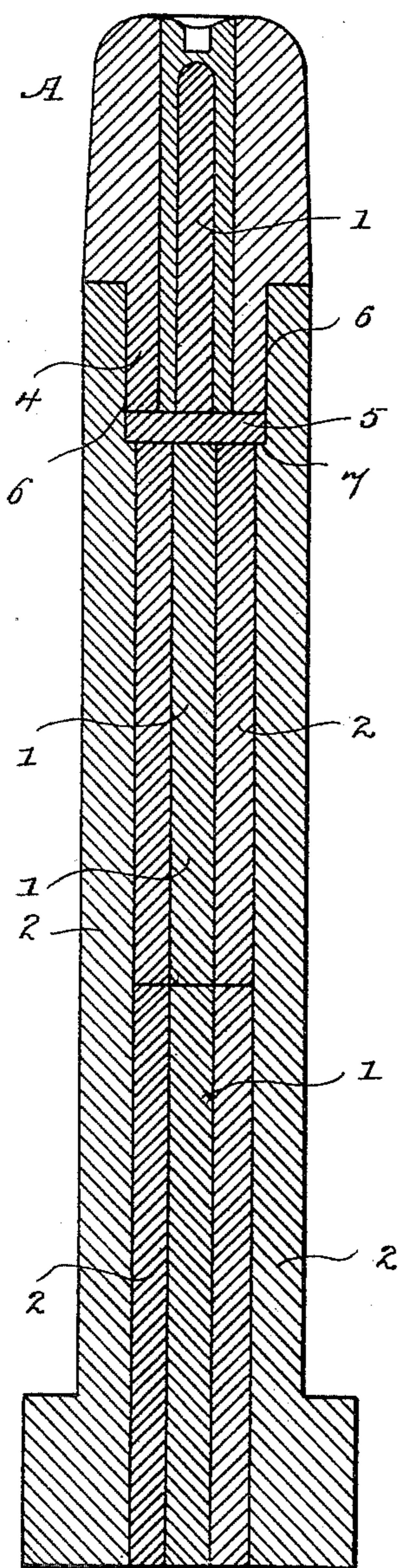


Fig. 2.

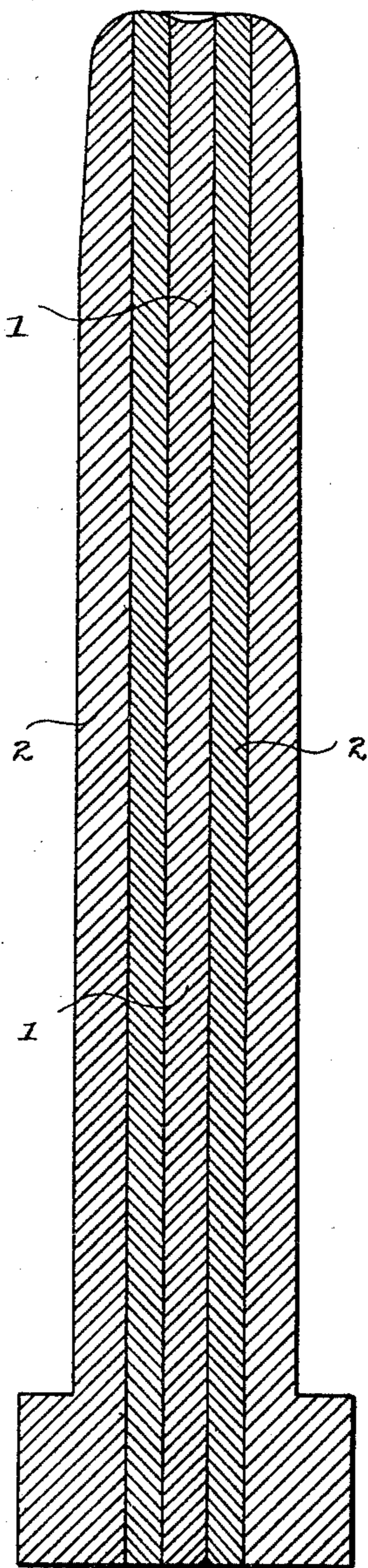
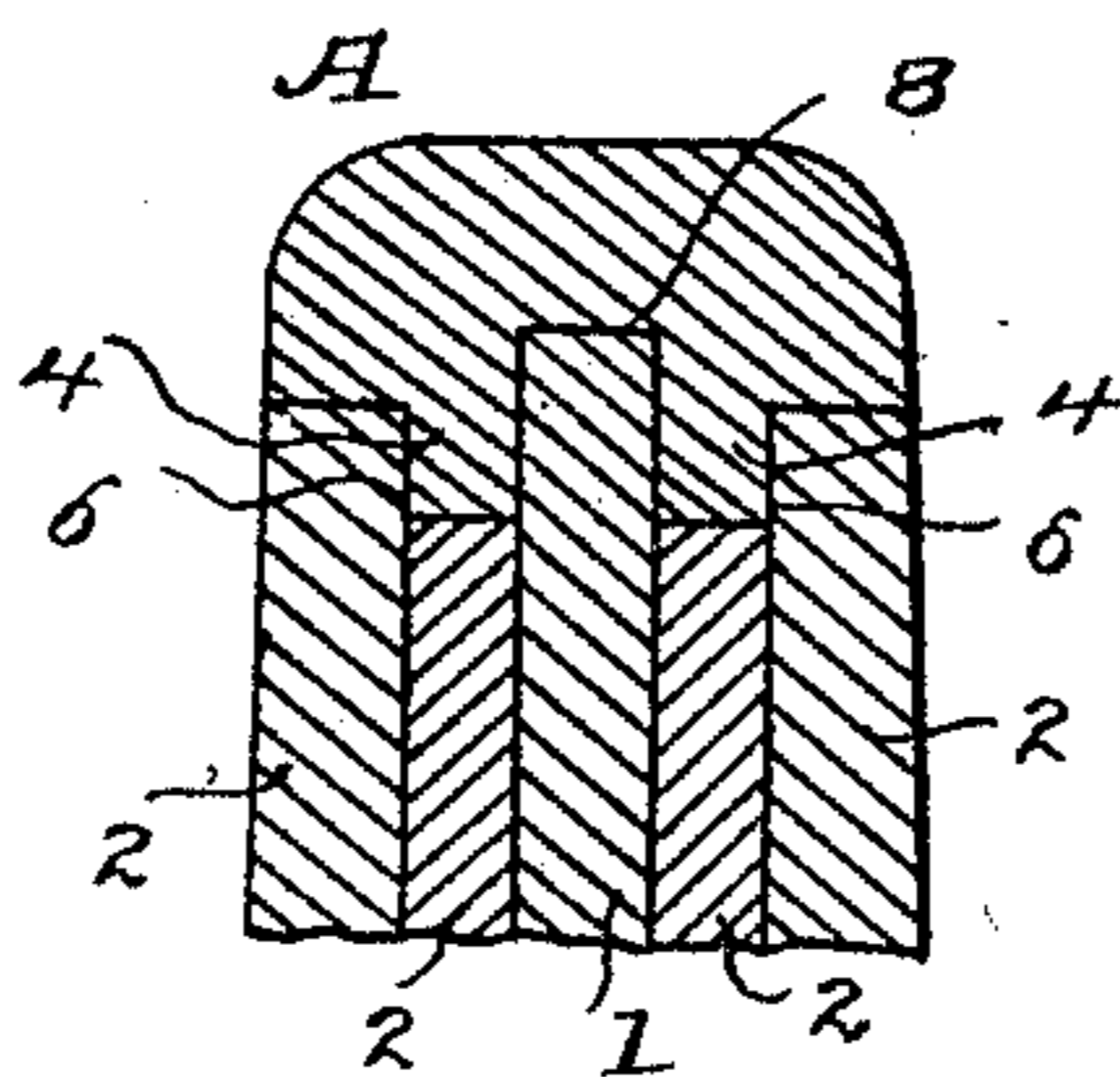


Fig. 3.



WITNESSES

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PUNCH.

SPECIFICATION forming part of Letters Patent No. 581,875, dated May 4, 1897.

Application filed January 23, 1897. Serial No. 620,412. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. WOODS, residing at Milford, and WILLIAM R. BROWN, residing at Bridgeport, in the county of Fairfield and State of Connecticut, citizens of the United States, have invented certain new and useful Improvements in Punches; and we 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.

Our invention has for its object to produce a punch adapted for general use, but more especially adapted for heavy work, which shall be comparatively inexpensive to produce and will be able to stand the severe strains to which punches are subjected in doing heavy work. As ordinarily constructed punches are made of a single piece of metal and are so tempered as to give the greatest possible hardness, the hardened portion, however, being a mere shell, and the interior of the mass of metal being practically unaffected by the process of tempering or hardening. It follows necessarily that punches constructed in this manner frequently give way in use, thereby adding greatly to the cost of manufacturing heavy articles drawn from sheet metal. In order to overcome this objection and produce a punch which will stand all the strains incident to heavy work, we have devised a novel punch built up from sections of tubing hardened both from the outside and the inside and having a hardened core, said sections of tubing and the core being driven one within the other under great pressure and being retained in place by a drive fit, the number of sections of tubing placed one within the other and the length and arrangement of the sections of tubing and the sections of core not being of the essence of our invention.

In the accompanying drawings, forming part of this specification, Figures 1, 2, and 3 are sectional views illustrating different modes in which we have carried our invention into effect.

In Fig. 1 we have illustrated a form of our novel punch in which the punch is built up from a number of sections of tubing not ex-

tending the entire length of the punch, the core likewise being in section. In Fig. 2 we have illustrated a form in which the punch consists of a core and two concentric sections of tubing extending the full length of the punch, and in Fig. 3 we have illustrated a form provided with a solid head.

1 denotes the core, and 2 concentric sections of tubing which inclose the core. As already stated, the number and the length of these sections is not of the essence of our invention. The core is hardened to the greatest degree possible and the tubes are hardened interiorly and exteriorly and finished perfectly smooth inside and out. In building up the punch the core is forced within a tube under pressure and the tube and core are forced within another tube under pressure, which operation may be repeated as many times as may be required, depending upon the size of the punch and the use for which it is designed. This system of construction enables us to produce punches that will stand an almost unlimited amount of heavy work. The core is so small that it can be hardened nearly if not quite through, and each of the tubes is hardened both inside and out, so that by building up punches in this manner the greater portion of the mass of the punch is hardened.

In Fig. 1 we have shown the punch as built up from sections which do not extend the entire length of the punch. It is not essential that the sections should be of the same diameter either internally or externally, nor is it necessary that the different sections of the core should be of the same diameter, as we have indicated clearly in Fig. 1. In the latter figure the outer section, with the exception of the head of the punch, is shown as made in one piece, the inner section and the core being made in two pieces.

The head of the punch, which we have indicated specifically by A, is formed from a core and two concentric sections of tubing, neither core nor tubing, however, corresponding in diameter with the core or tubing of the body of the punch. In this form the head of the punch is shown as provided with a reduced lower end 4, which fits within a corre-

sponding socket 6 at the upper end of the body. A hardened plate 5 may or may not be placed between the base of the socket and the end of the reduced portion of the head 5 for the latter to rest upon. We have shown the outer section of tubing as provided with an internal shoulder 7, upon which plate 5 rests, thereby insuring that endwise strain shall be evenly distributed upon both sections 10 of tubing and the core. In Fig. 3 we have shown a punch of the same type provided with a solid head. In this form socket 6 is not made as deep as in the other form, the hardened plate is dispensed with, and the end 15 of the core lies in a socket 8 in the head.

In the form shown in Figs. 1 and 3 the head A serves to distribute the force of the blow and prevents the formation of rings on the blank in case the outer tube of the body of 20 the punch is compressed more than the inner tube or core.

Having thus described our invention, we claim—

25 1. A built-up punch comprising in its construction a hardened core and concentric tubes hardened interiorly and exteriorly, and

a head covering the ends of the tube and core of the body of the punch.

2. A built-up punch comprising in its construction a body consisting of a hardened 30 core and concentric sections of tubing hardened interiorly and exteriorly, said body being provided with a socket, and a head having a reduced end which engages the socket, said head covering the ends of the tube and 35 core of the body of the punch.

3. A built-up punch comprising in its construction a body consisting of a hardened core and concentric sections of tubing hardened 40 interiorly and exteriorly, said body being provided with a socket 6, and a solid head having a reduced end which engages socket 6 and a socket 8 which receives the end of the core, said head covering the ends of the 45 tube and core of the body of the punch.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE H. WOODS.
WILLIAM R. BROWN.

Witnesses:

ANDRÉ B. WALDHAUS,
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