

J. V. Westlake,

Metal Punch,

1237, 189,

Patented Dec. 16, 1862,

Fig. 1

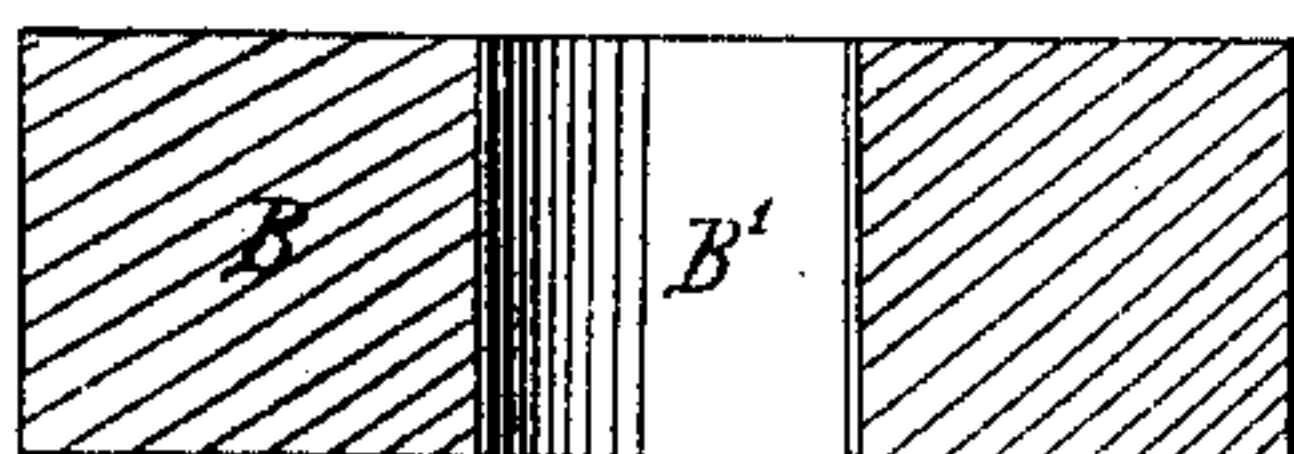
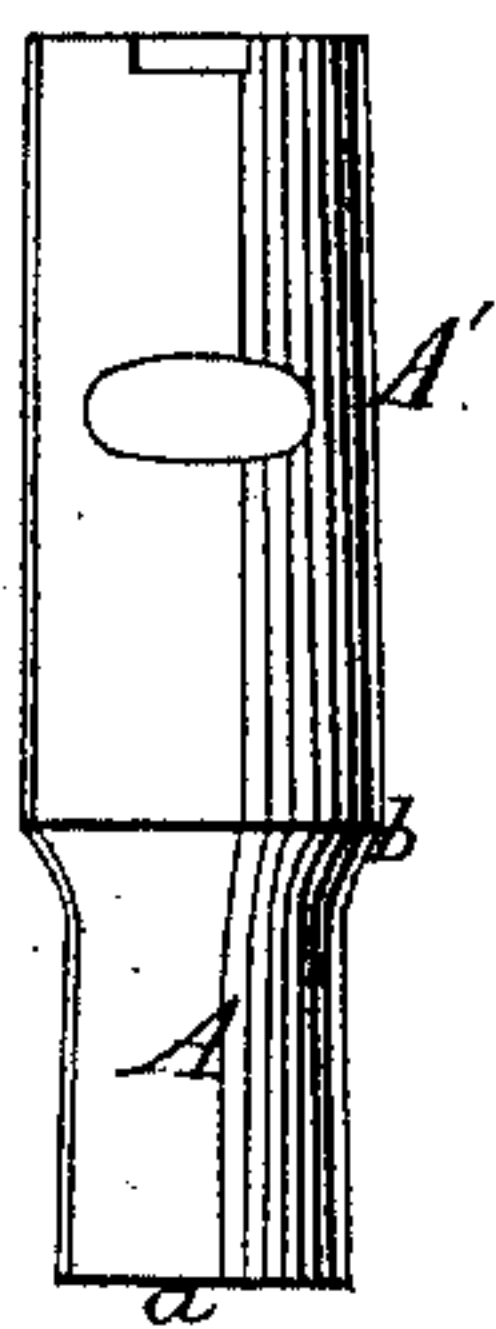


Fig. 2

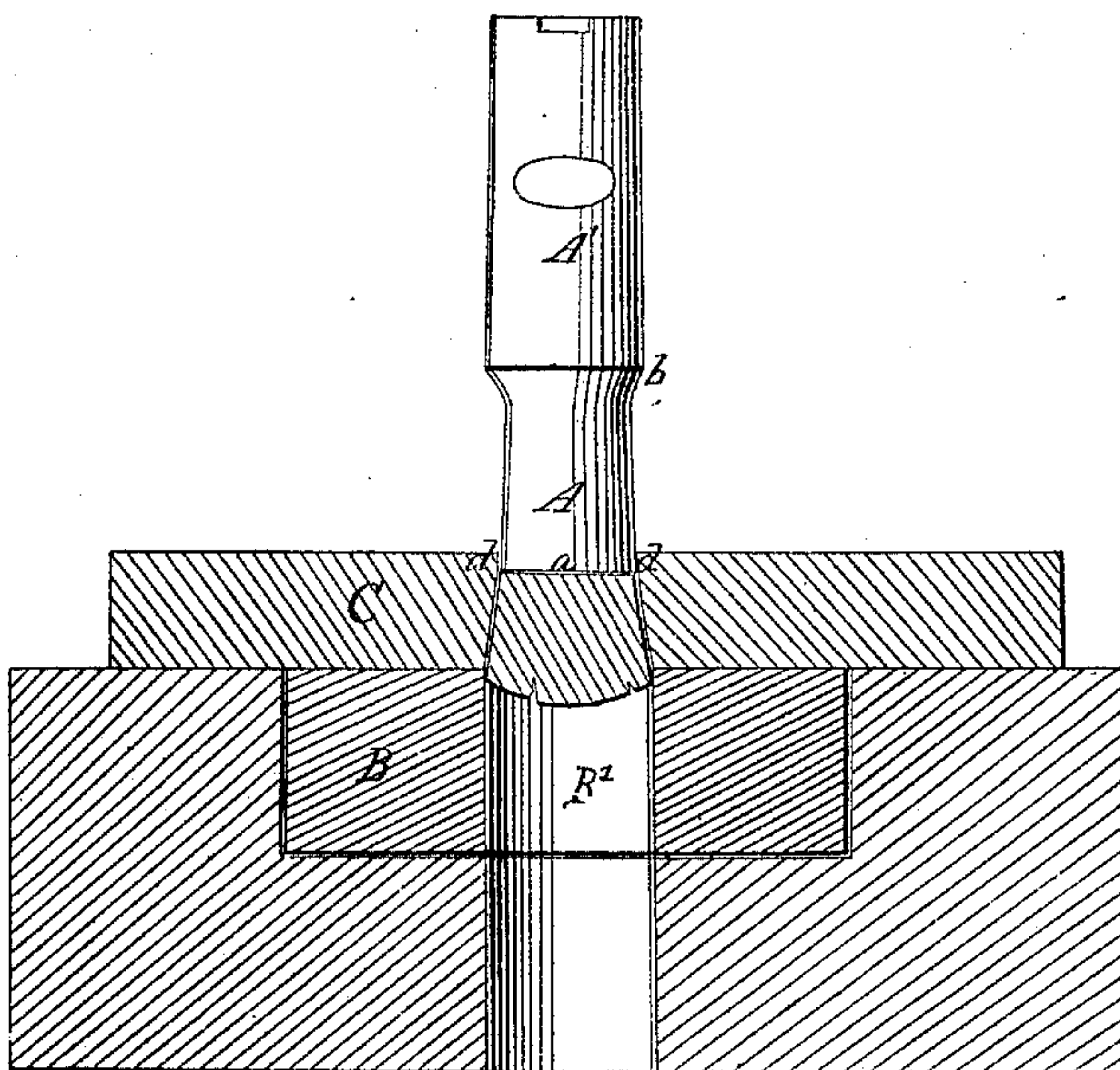


Fig. 3

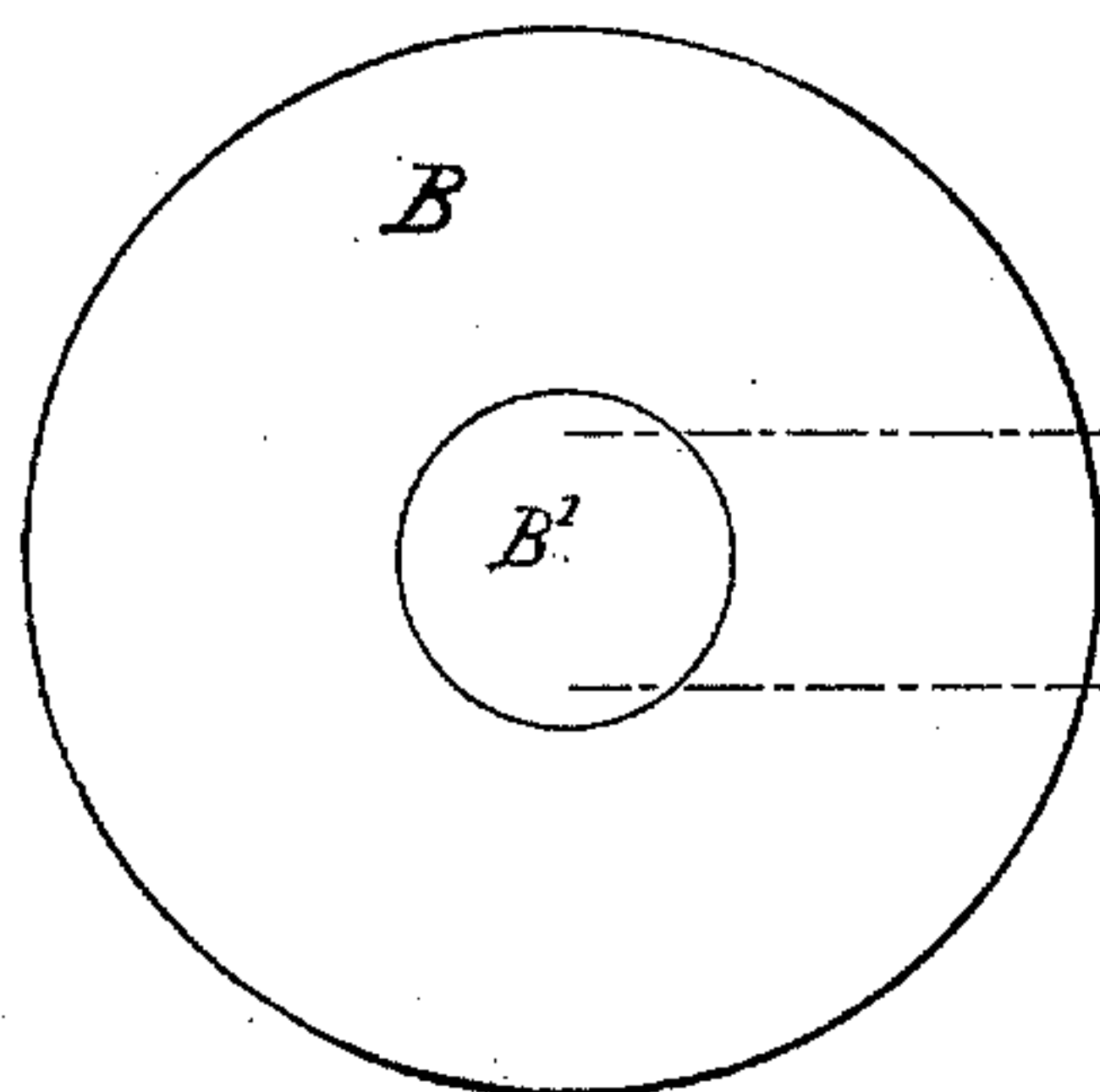


Fig. 4

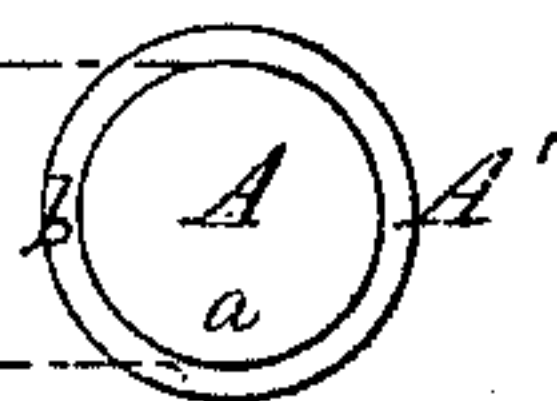


Fig. 6

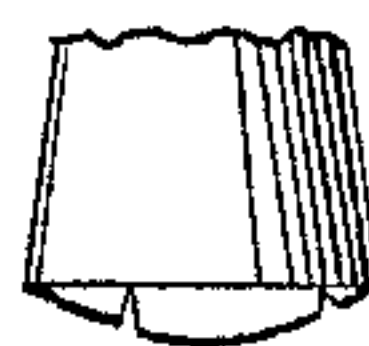
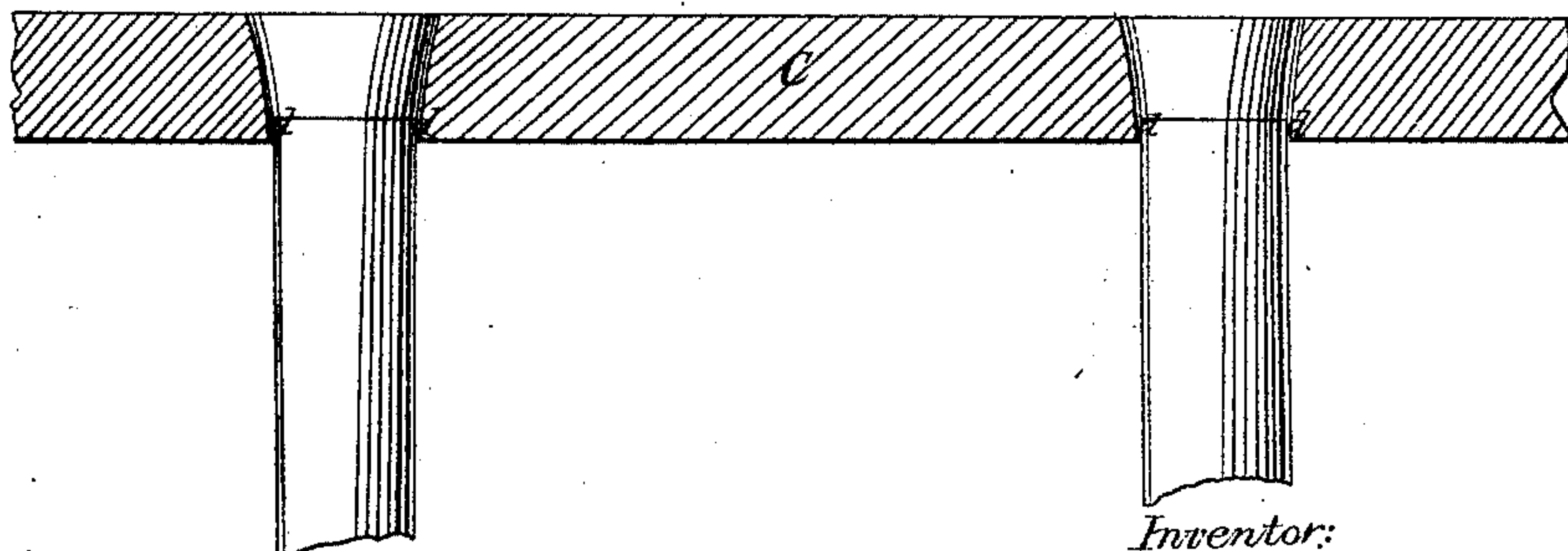


Fig. 5



Witnesses:
James D. Smith
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Inventor:
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UNITED STATES PATENT OFFICE.

JAMES V. WESTLAKE, OF ST. LOUIS, MISSOURI.

IMPROVED MODE OF PUNCHING COUNTERSUNK HOLES.

Specification forming part of Letters Patent No. 37,189, dated December 16, 1862.

To all whom it may concern:

Be it known that I, JAMES V. WESTLAKE, of St. Louis city and county, and State of Missouri, have invented a new and useful Improvement in Punching Metals; and I do hereby declare that the following is a full, clear, and accurate description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows a punch and die capable of performing my invention. Fig. 2 shows the same in operation. Fig. 3 is a top view of the die; Fig. 4, an end view of the punch. Fig. 5 shows a plate of metal punched according to my invention, and with the head of a bolt countersunk in a conical perforation formed according to my invention. Fig. 6 shows the blank piece of metal which is punched out of the plate.

Similar letters of reference in the several figures indicate corresponding parts.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same more minutely.

A A' in the drawings represent a circular punch, with its end *a* flat, and with a slight taper from said end up to the shoulder *b* or to the enlarged portion A¹, which is cylindrical from the shoulder *b* to its upper terminus and flat on top. The diameter of the end *a* for a given-size hole may be nine-sixteenths of an inch—that is, for a hole which increases gradually from nine-sixteenths of an inch diameter to one inch diameter. This proportion may of course be varied accordingly as it may be desired to vary the flare or countersink of the hole or to the thickness of the plate or bar.

B B' represents the die to be set in a solid bed-plate, and with the punch-hole B¹ about one inch diameter, if for use with a punch, A A', nine-sixteenths of an inch in diameter.

The punch is set to work centrally relatively to the hole in the die, and the plate or bar of metal—say, three-quarters of an inch thick—rests flat upon the die, as indicated at C, Fig. 2.

The power is applied on the punch so as to cause it to enter the bar C about one-eighth of an inch, making the hole the same size of the punch to that depth, and then it breaks the iron on straight radiating lines from the outer diameter of the end of the punch to the outer circle of the hole in the die; or, in other

words, the hole is punched by actual contact of the punch with the plate or bar along about one-eighth of its thickness, and then the metal is fractured on straight oblique lines leading from the base of the punch, after the manner of lines forming a frustum of a cone, to the edge of the hole in the die, at which latter point the metal is also punched by actual contact with the edge of the hole in the die for a short distance; but between the two points where actual cutting contact takes place the cutting action of the punch and die is not brought into play, but the chunk of metal or blank, Fig. 6, is removed by simply the thrust of the punch.

It will be observed that the holes punched by my invention are cylindrical along a portion of their smallest diameter, as indicated between the letters *d d*, and therefore a portion of the fastening bolts of the plating or bars below their heads extends into the plating or bars, and thus greater strength in the bolts secured, as the plating acts as a support or stay to them below or beyond their heads. This is not the case with holes which are drilled on a taper from top to bottom.

My invention enables me to punch all of the holes to a uniform size, whereas with a drill there is a variation experienced on account of the wearing away of the drill from use.

My invention will save the expense of three or four cents on each hole which has to be drilled, and will greatly expedite the construction of iron-clad armor for our naval ships, &c.; and from experience with it in the erection of the gunboat Essex, at St. Louis, I am satisfied that it will answer all the purposes of machinery required for drilling countersunk holes if not of an extraordinary size.

It is obvious that circular, elliptic, square, and any other desired geometrical form of hole might be punched according to my invention by varying the shape of the punch and die; therefore I do not limit myself to forms and shapes.

I do not claim to be the inventor of a solid blunt punch, nor of a die with a hole large enough to admit such punch down through it; nor do I claim the discovery that such punch and die incidentally impaired the shape of the hole in the metal by making it slightly taper, instead of truly cylindric; but my invention consists in the discovery that by ex-

tending the diameter of the hole in the die the countersunk holes required for the taper heads of bolts and like fastenings could be made by a punching, instead of a boring, operation, and in the application of this discovery to the making of such countersunk holes for that purpose; therefore,

What I do claim, and desire to secure by Letters Patent, is—

The punching of countersunk holes in metal, so that the same shall be applicable to the

practical use of receiving the taper or inverted cone-shaped heads of bolts and other like fastenings, substantially as described.

Witness my hand and seal in the matter of my application for a patent for an improved mode of punching countersunk holes.

JAMES V. WESTLAKE. [L. S.]

Witnesses:

SOL. SCOTT, Jr.,
LIBERTY WAITE.