

(No Model.)

F. A. GRACE.

DEVICE FOR SHARPENING ROCK DRILLS.

No. 397,230.

Patented Feb. 5, 1889.

Fig. 5.

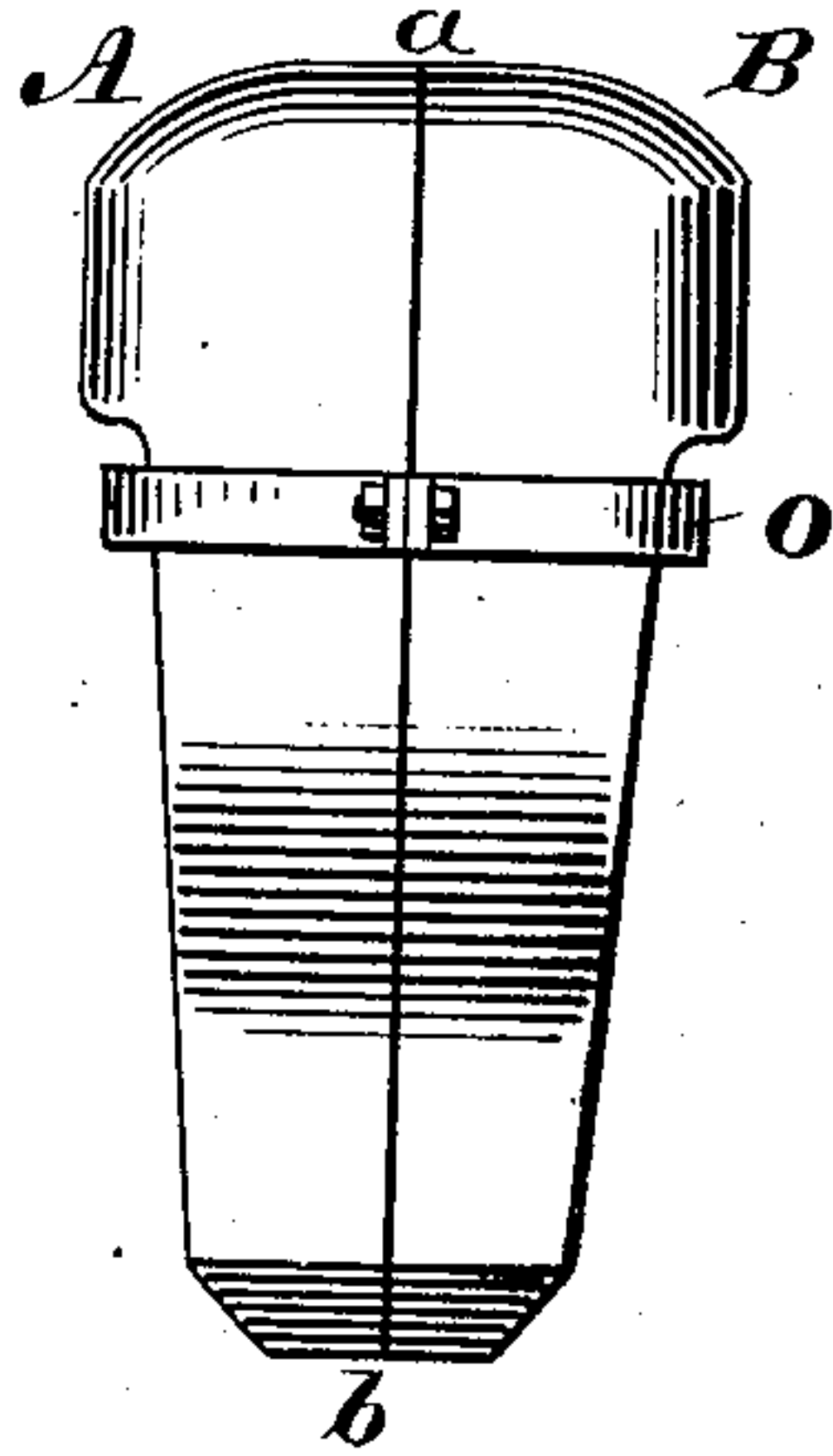
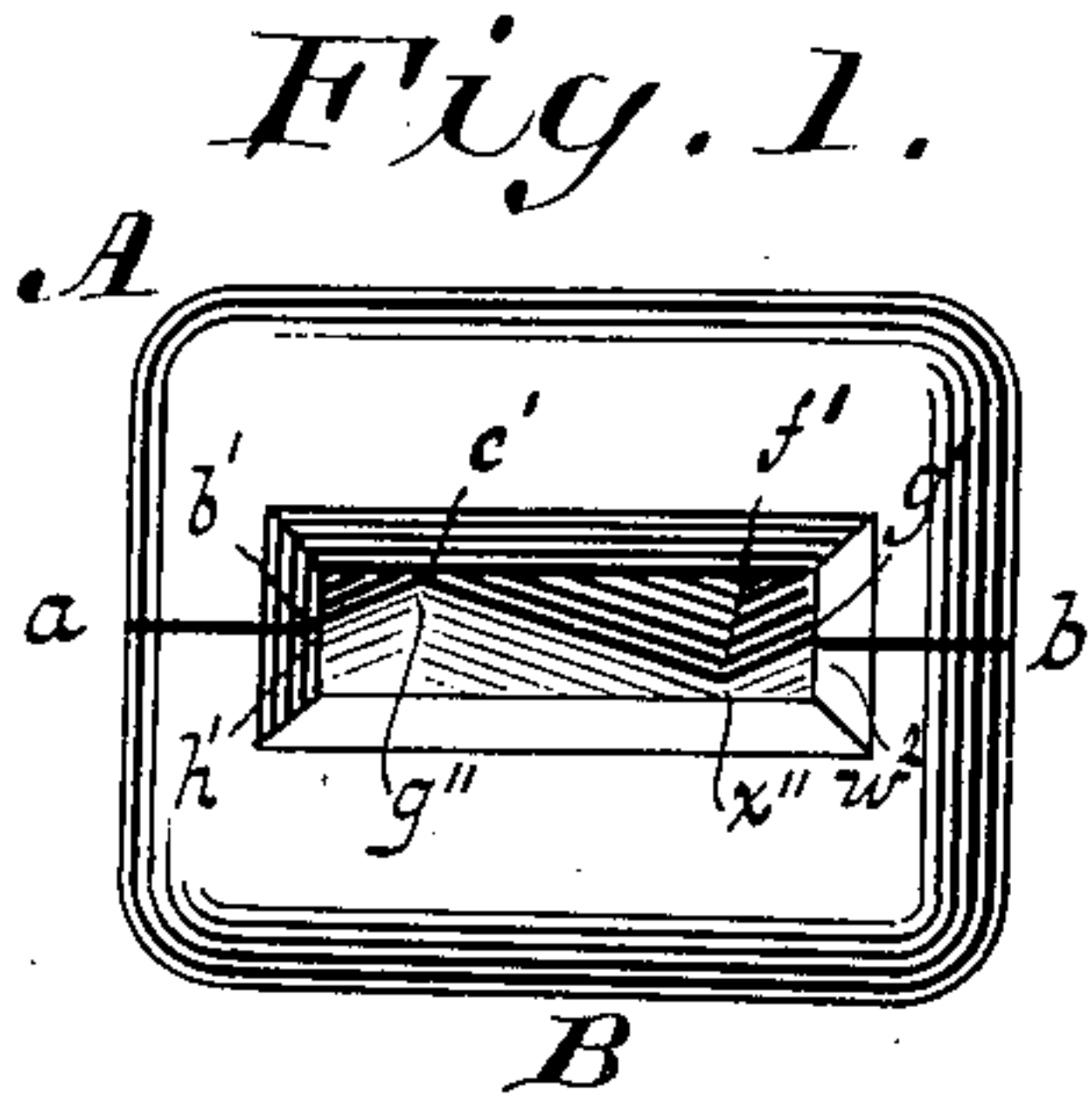


Fig. 3.

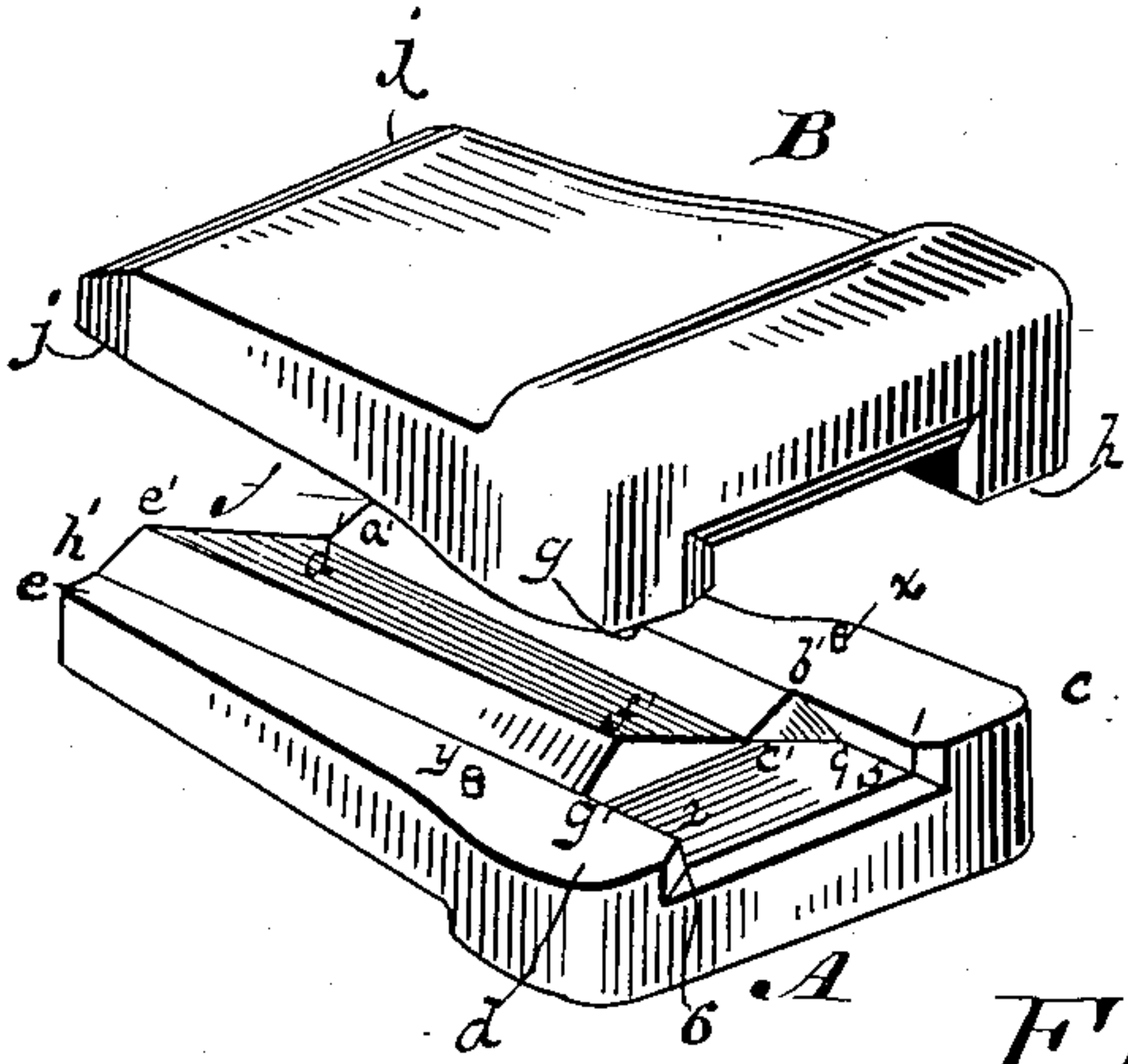


Fig. 2.

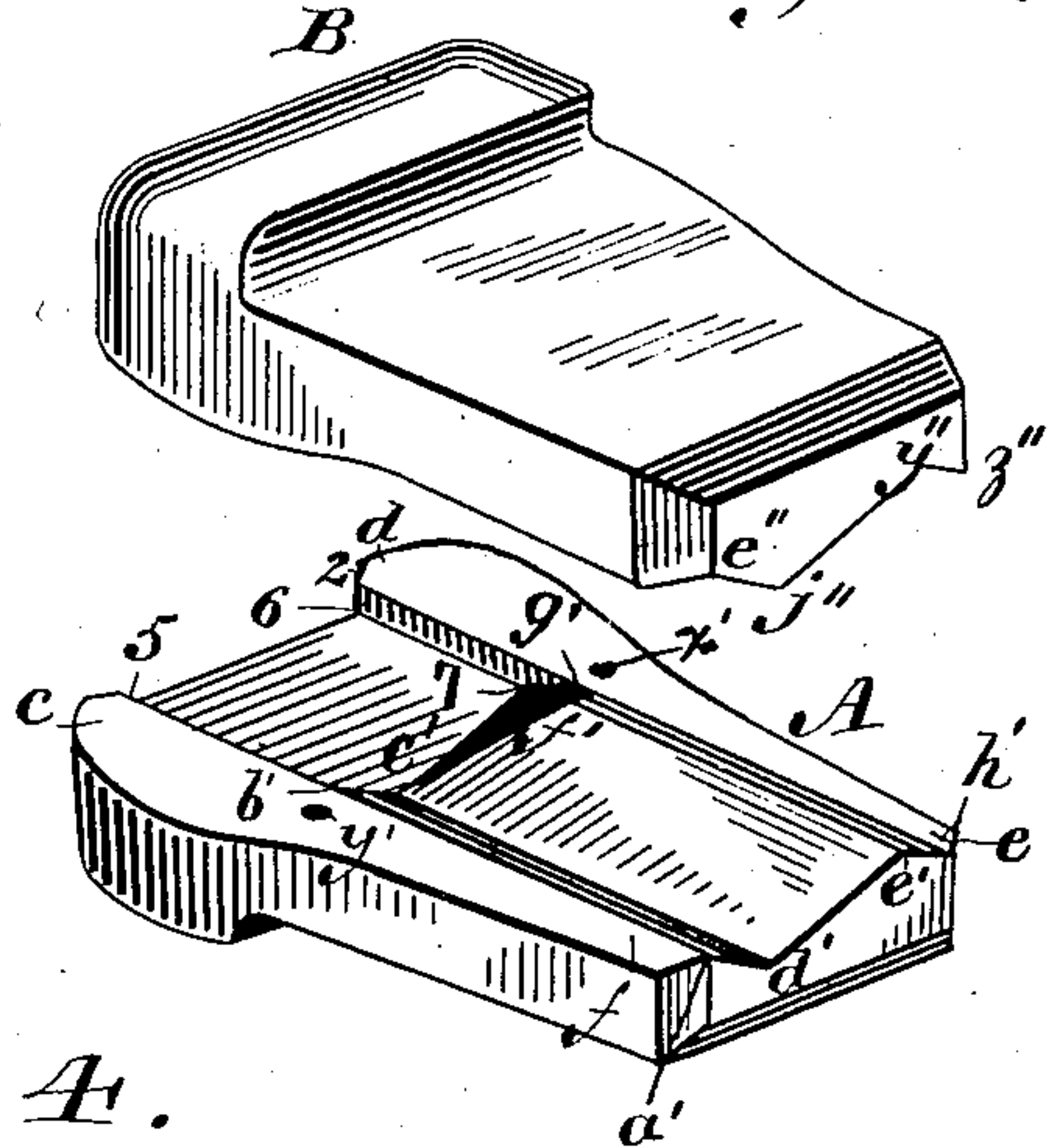
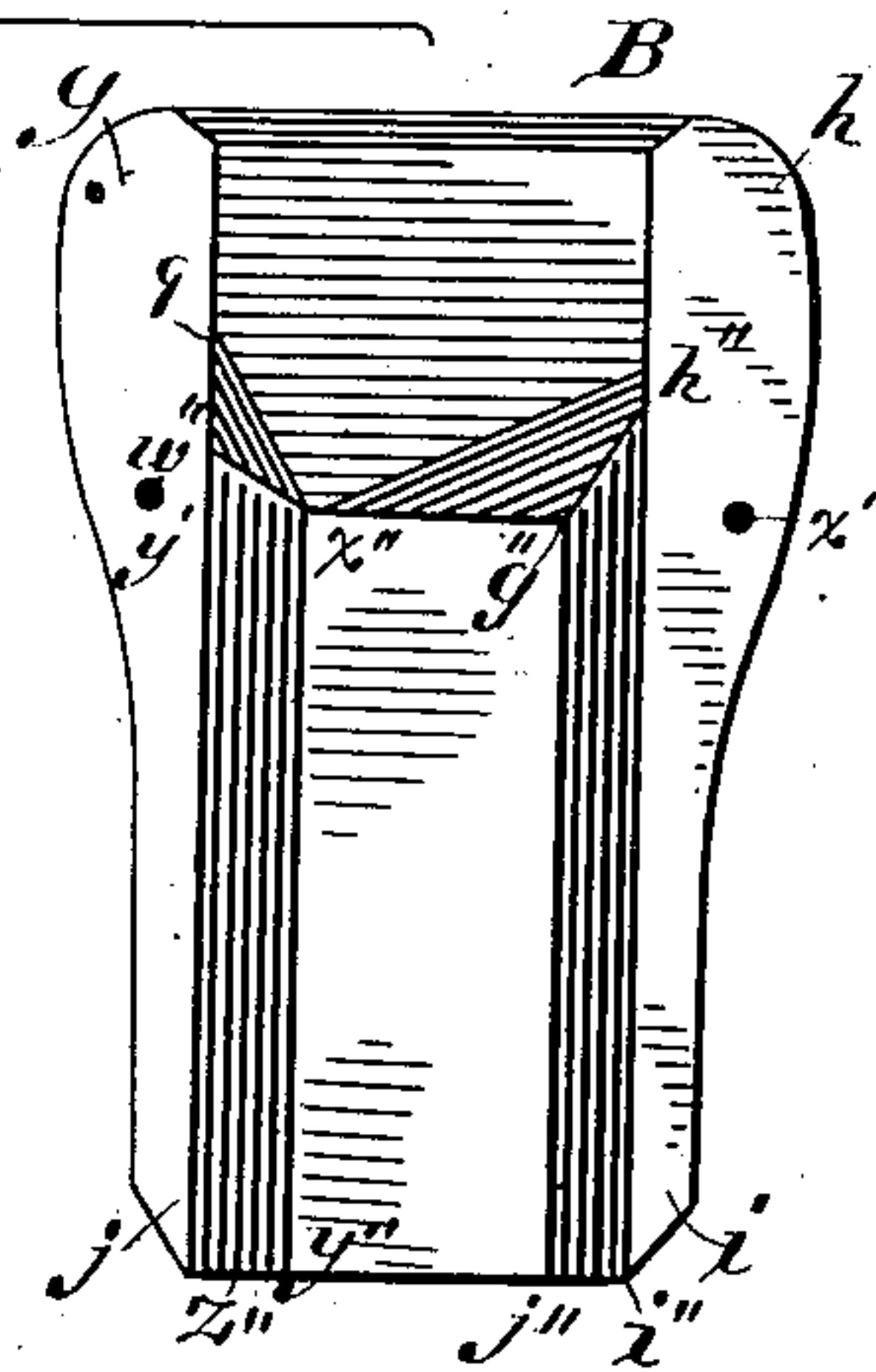
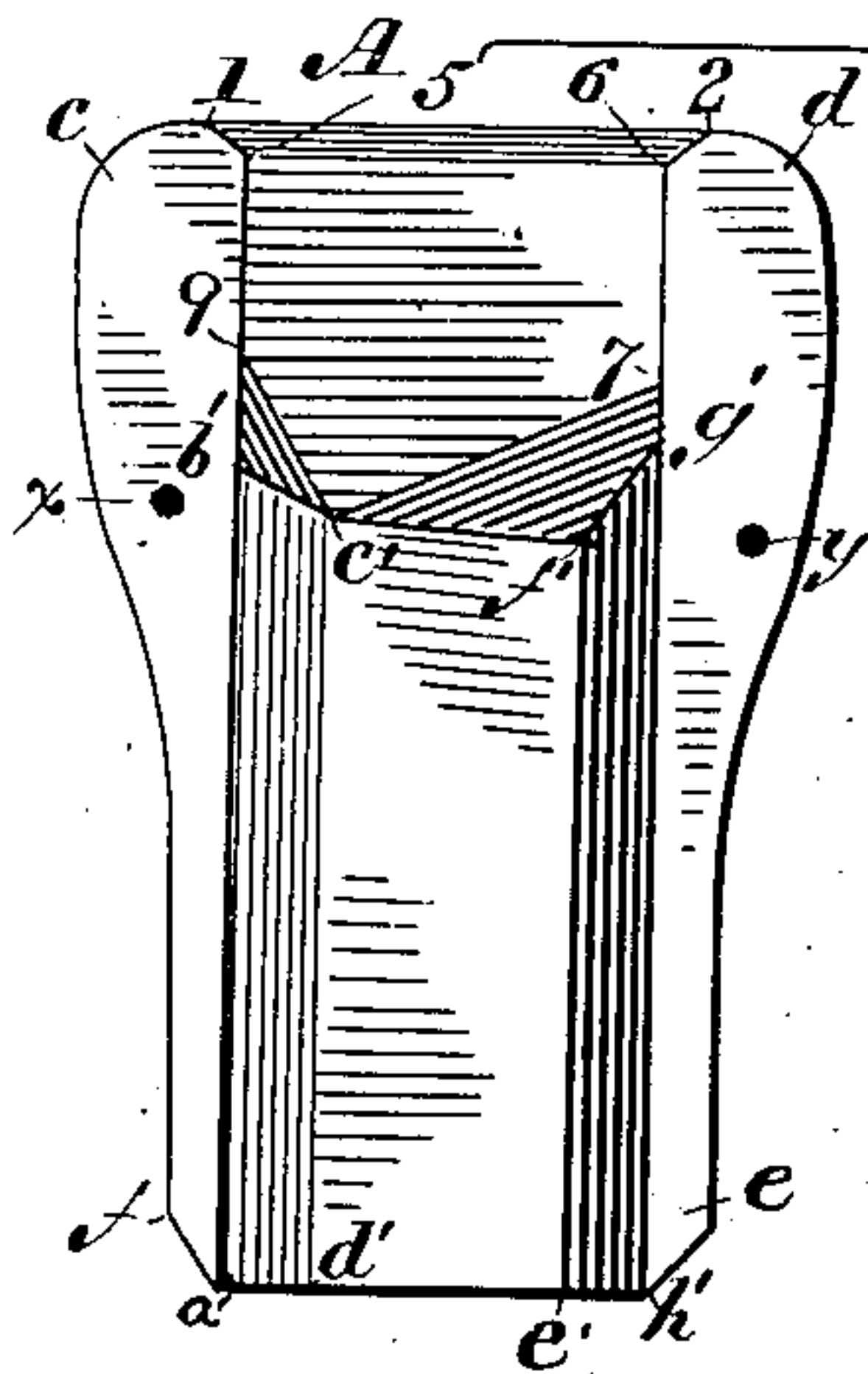


Fig. 4.



WITNESSES

H. C. Neuman,
O. S. Neuman,

INVENTOR

Frederick A. Grace,
By his Attorney
Marcus S. Hopkins.

UNITED STATES PATENT OFFICE.

FREDERICK A. GRACE, OF HICKORY, NORTH CAROLINA.

DEVICE FOR SHARPENING ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 397,230, dated February 5, 1889.

Application filed June 2, 1888. Serial No. 275,828. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. GRACE, a citizen of the United States, residing in Hickory, Catawba county, and State of North Carolina, have invented a new and useful Improvement in Swages for Forming Rock-Drills, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in swages for forming or sharpening a rock-drill so as to give it a superior arrangement of cutting-edges that will increase the cutting capacity of the drill. The swage is adapted for the formation of steel by forcing it while hot by a heavy blow or pressure into the swage-cavity and causing it to take the form of the cavity.

My invention consists of a new and useful improvement, which I shall fully describe in my following specification, and which I shall clearly set forth in my claim.

In the accompanying drawings, Figure 1 is a front view of the swage, showing its general outline and the cavity in its face, $a b$ indicating the line of division between the two parts of the swage. Fig. 2 indicates a rear perspective view of the two halves of the swage along lines $a b$ of Fig. 1, each being formed so that the parts of one fit closely into the corresponding parts of the other. Fig. 3 is a front perspective view of the two halves of the swage, giving an opposite view from that shown in Fig. 2, and showing the two halves, which, joined together as in Fig. 1, form the cavity of the swage in which the drill is shaped. Fig. 4 is a vertical sectional view of both halves of the swage separated. Fig. 5 is a view of the two parts combined and joined together by the movable and adjustable band O , as is necessary to resist the expansion of the metal of the drill when it has been placed in position and the blow has been struck to shape the lines of the drill.

In Fig. 2 in the half A of the swage, $c d e f$ is the plane surface of the division of the two parts of the swage which corresponds with the plane $g h i j$ of the half B, Fig. 4. The plane $a' b' c' d'$, formed at an oblique angle with the plane of division $c d e f$, is parallel to the plane $e' f' g' h'$, the latter forming the same angle with the plane of division as the

former plane, but opening in an opposite direction. The plane $d' c' f' e'$ is bounded by the edges $d' c'$ and $f' e'$ of the plane $a' b' c' d'$ and parallel plane $e' f' g' h'$. In the half B the plane $w' x' y' z'$ forms a depressed angle with the plane $x' g' j' y'$, and the plane $x' g' j' y'$ forms a like angle with the plane $g' h' i' j'$, so that when the two halves of the swage are connected together the angles of the half A closely fit into the opposite angles of the half B.

In Fig. 4 in the half A, $1 2 g' b'$ is an oblong rectangular cavity sunk below the surface of the plane $c d e f$, the plane $5 6 7 c' 9$ lying parallel to the plane $c d e f$. The opening in the cavity is formed by the lines $1 5 6 2$. $c' b'$ indicate a line at which the plane $a' b' c' d'$ extends to the cavity $1 2 g' b'$. At this line a beveled plane, $b' c' 9$, forms an oblique angle with the plane $a' b' c' d'$, the plane $b' c' 9$ forming also an oblique angle with the plane of the cavity $5 6 7 c' 9$ and with the plane side of the cavity $1 5 9 b'$ at $c' f' g'$, and the plane $c' f' g' 7$ intersects at an oblique angle the plane $c' d' e' f'$ and the plane $e' f' g' h'$. The plane $c' f' g' 7$ forms also an oblique angle with the plane $5 6 7 c' 9$ and also with the plane side of the cavity $2 6 7 g'$, so that I have the bottom of the cavity in the half A bounded by a triangular side, $b' c' 9$, and the irregular figure $c' f' g' 7$. These figures form one half of the cutting-edges of the drill. In the half B there are corresponding figures, the lower side of the triangular facet of the drill in the side B being formed by the line $f' g'$, and the lower angular edge of the irregular facet of the side B being formed by the angle $b' c' f'$, so that when the sides A and B are joined together the cavity in A and the cavity in B form one rectangular cavity for the reception of the drill metal. The triangle $b' c' 9$ of the figure A is opposite to the irregular facet of the side B, and the irregular facet $c' f' g' 7$ of the side A is opposite to the triangular facet of the side B.

x and y indicate two projecting pins on either side of the half A, made to fit into corresponding indentations, $x' y'$, in the side B, so that when the two sides are placed together the projections, fitting into the indentations, tend to hold the two halves firmly together

and to hold the angles of the cavity rigidly in position. The formation of the two halves of the swage is; Fig. 5, shown to be more or less wedge-shaped. This is done in order that the
 5 band O may fit over the outside surface of the swage when put together, and may be driven down so as to produce a constantly-increasing binding force upon the two parts A and B of the swage.

10 It will be seen that if the two parts of the swage are bound together, as indicated in Fig. 5, by the band O and a piece of steel heated to the requisite temperature is driven into the cavity indicated in Fig. 1 the steel will re-
 15 ceive the form of the sides of the cavity, so that a drill will be produced having its cutting-edges formed by the beveled sides $b'c'9$ and $c'f'g'7$ of the one half of the swage and corresponding beveled sides on the opposite
 20 half of the swage. It is upon this peculiar form of the cavity of the swage that I base my invention. This formation secures greater cutting-power to the drill whatever may be the means by which the drill is operated.

25 What I claim as new, and desire to secure by Letters Patent of the United States, is—

A swage divided in two parts, having in one half, A, the plane $a'b'c'd'$, parallel to the plane $e'f'g'h'$, and the two, forming equal angles with the plane $d'e'f'c'$, made to cor- 30 respond to and fit into the opposite plane surfaces of the half B, and having a rectangular cavity in the side A, bounded on the lower side by the triangular plane figure $b'c'9$, placed at an oblique angle with the planes 35 which it intersects, and the irregular plane $c'f'g'7$, also at oblique angles with the planes which it intersects, the planes $b'c'9$ and $c'f'g'7$ corresponding with planes of similar shape and formed upon the side B, so that the 40 base of the triangular facet in B shall be $f'g'$ and the base-lines of the irregular facet in B shall correspond to $b'c'f'$ in A.

In testimony of all which I have hereunto subscribed my name.

FREDERICK A. GRACE.

Witnesses:

R. J. HERNDON,
 H. T. HARRIS.