

(Model.)

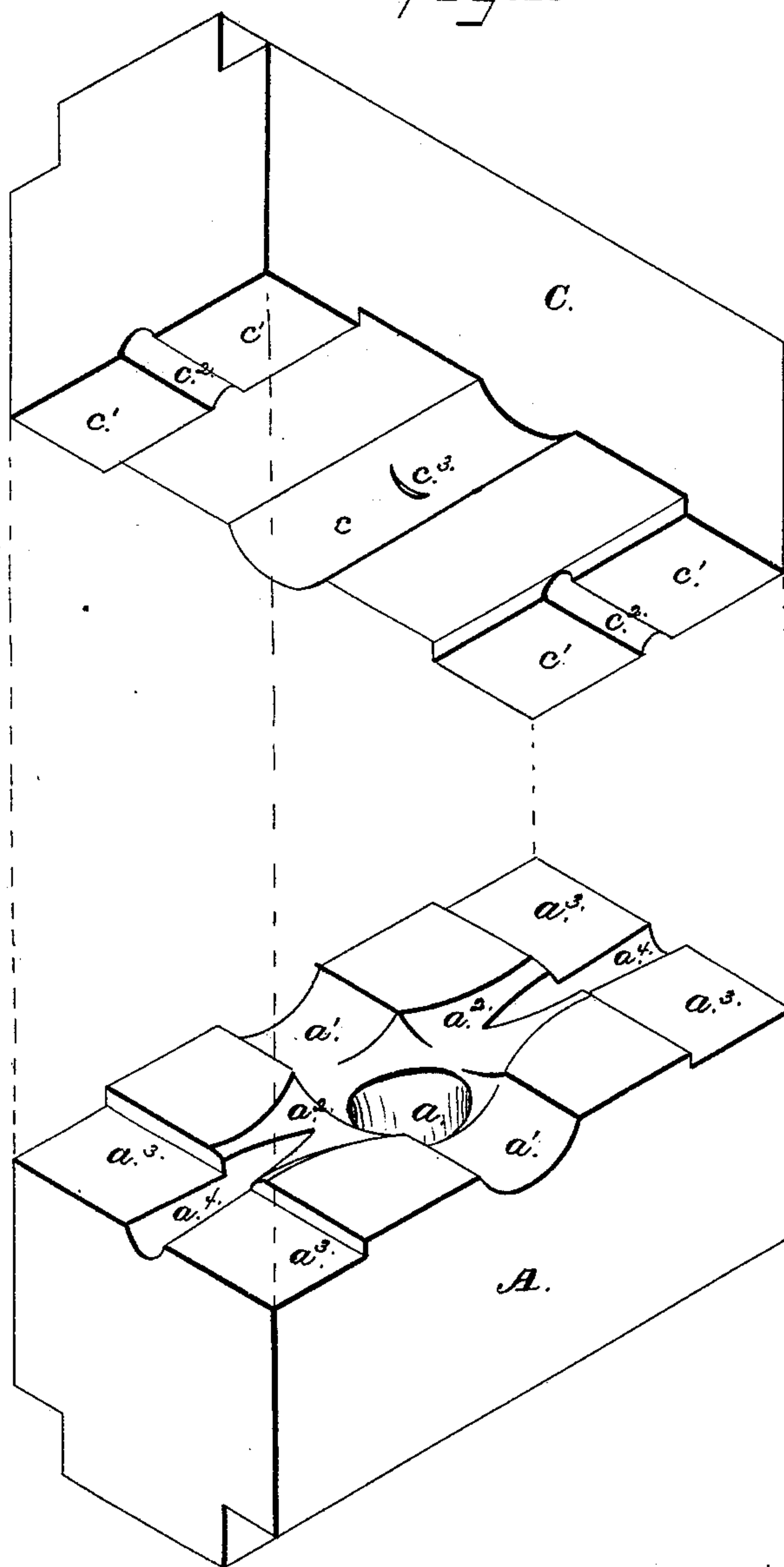
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W. PEARCE.  
Die for Forming King Bolts.

No. 234,059.

Patented Nov. 2, 1880.

Fig. 1.



WITNESSES=

Geo. E. Hutchinson.

Henry C. Hazard.

INVENTOR.

Wm. Pearce, by

Geo. S. Prindle, his Att'y

(Model.)

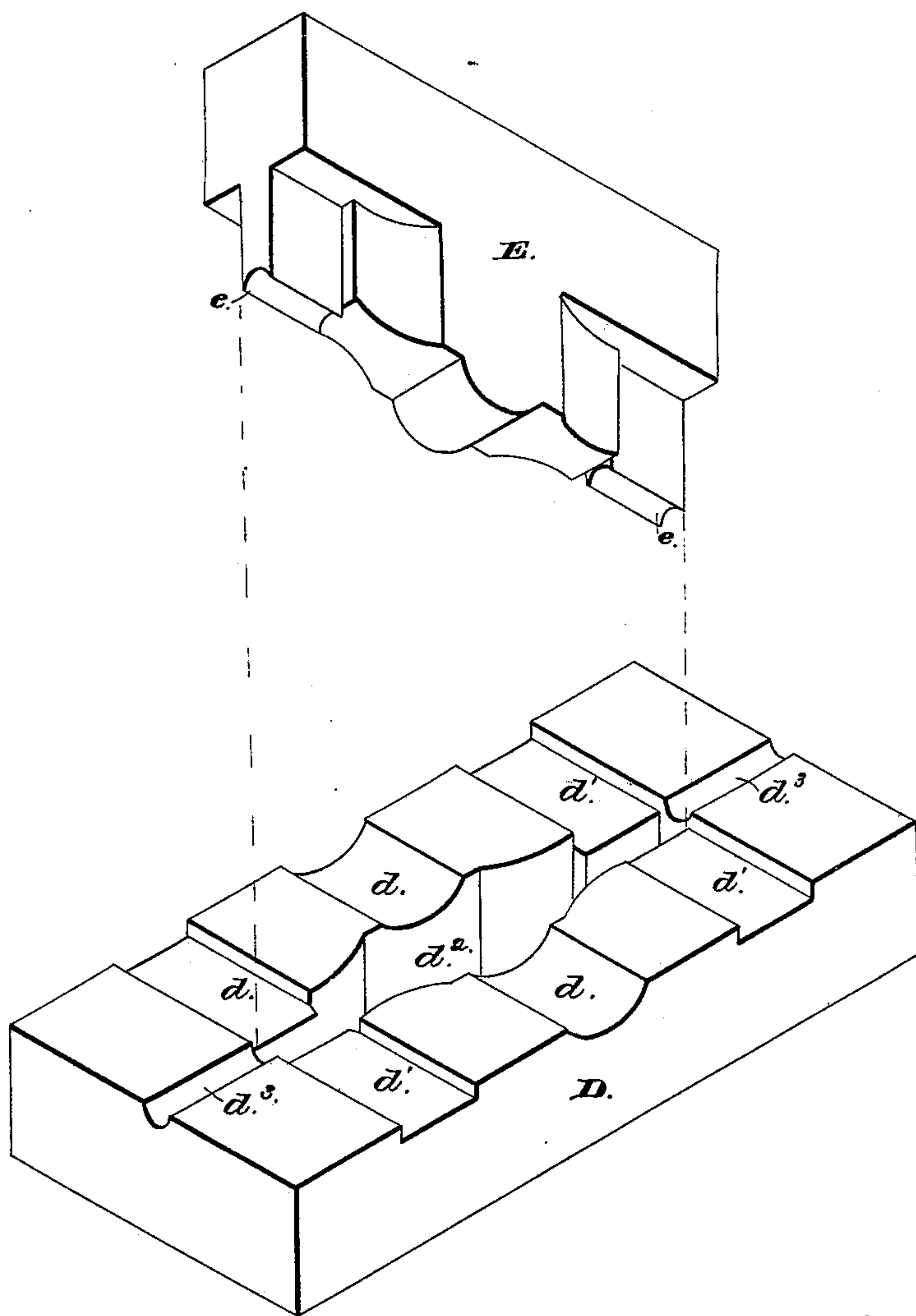
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W. PEARCE.  
Die for Forming King Bolts.

No. 234,059.

Patented Nov. 2, 1880.

Fig. 2.



WITNESSES=

Jas. E. Hutchinson.  
 Henry C. Hazard.

INVENTOR.

Wm. Pearce, by  
 Geo. S. Prindle, his Att'y

(Model.)

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Fig. 3.

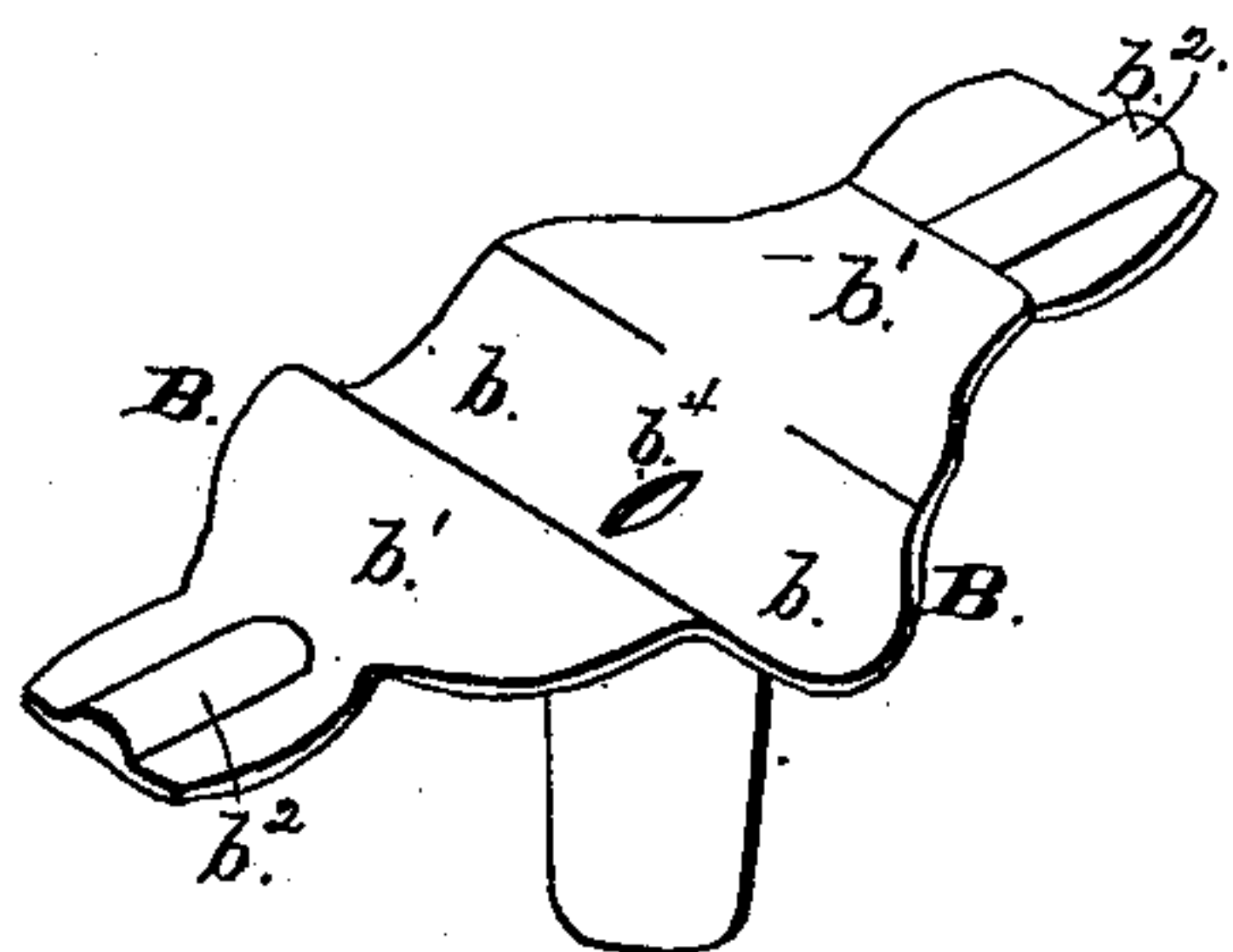


Fig. 4.

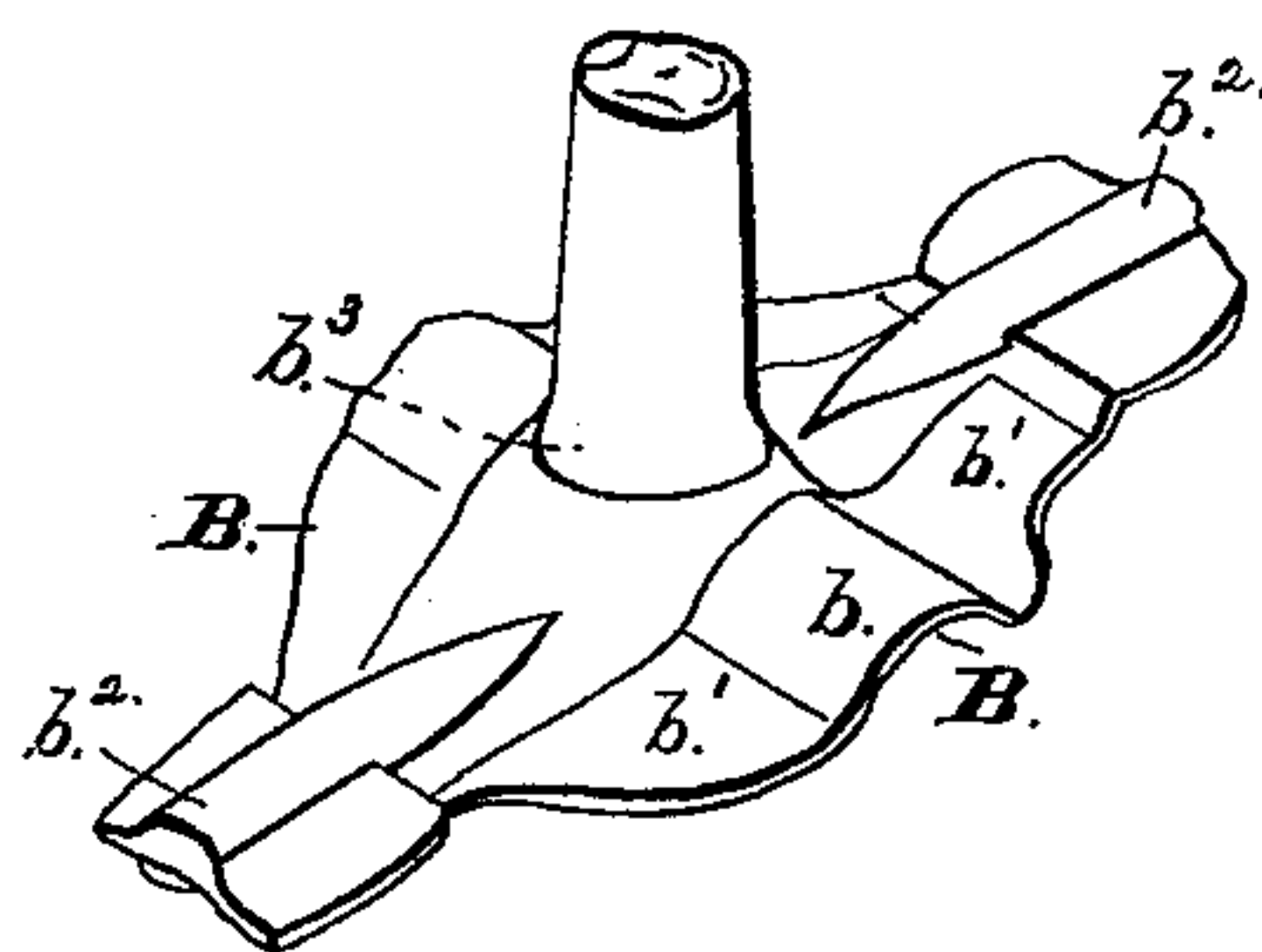


Fig. 5.

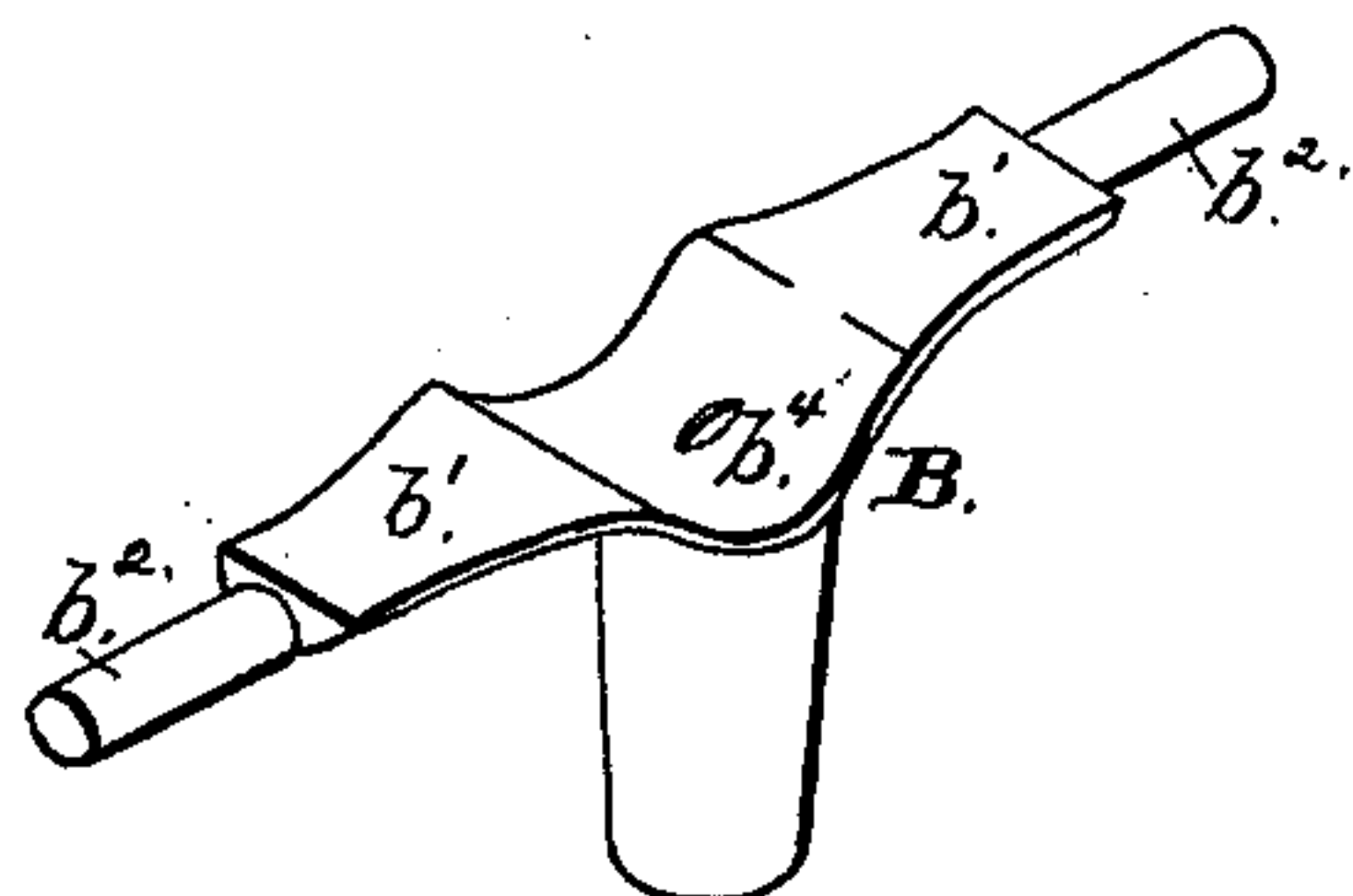
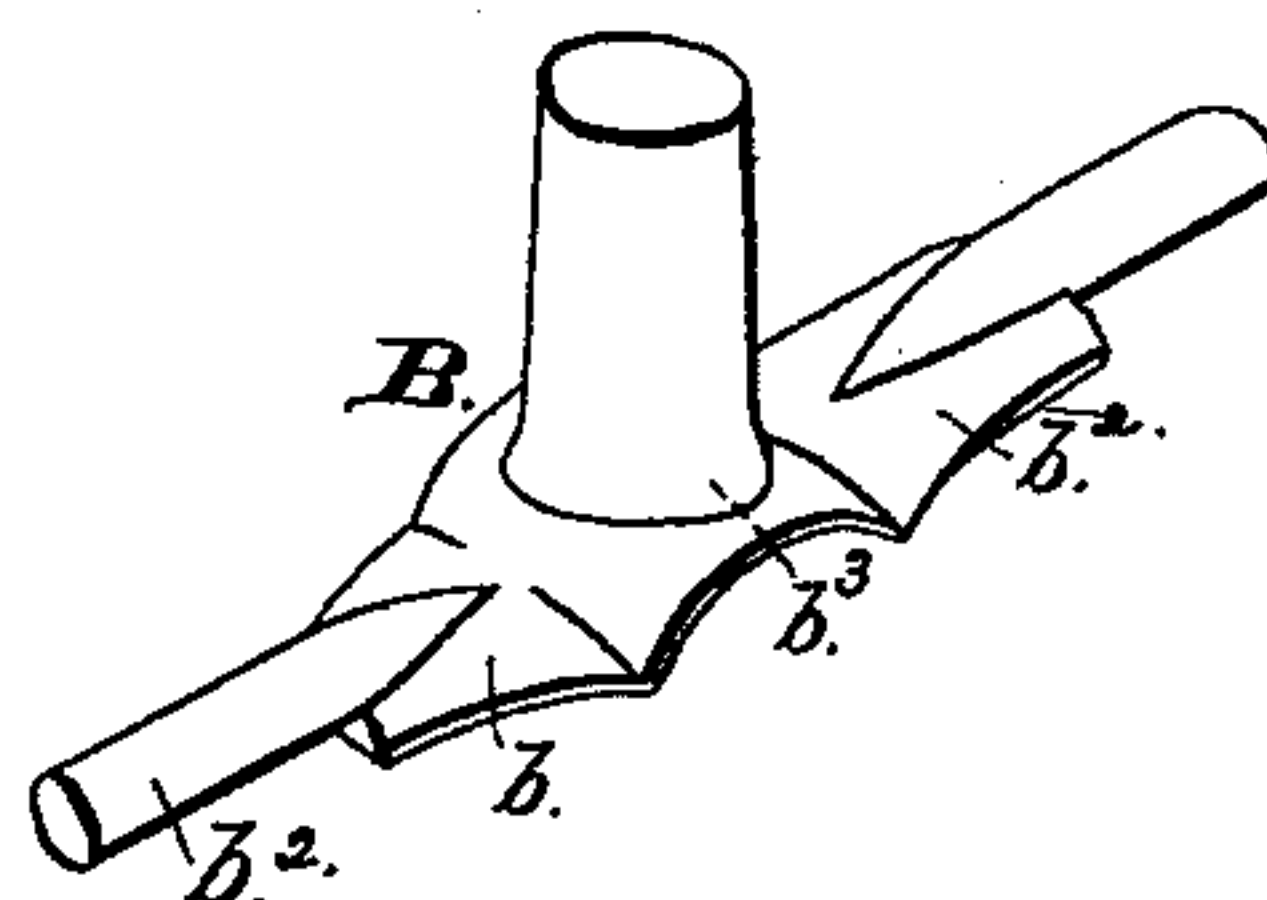


Fig. 6.



WITNESSES=

Jas. E. Hutchinson.  
 Henry C. Hazard.

INVENTOR.

W. Pearce, by  
 Geo. S. Prindle, his Att'y



# UNITED STATES PATENT OFFICE.

WILLIAM PEARCE, OF SOUTHTON, CONNECTICUT, ASSIGNOR TO HIMSELF,  
NORMAN A. BARNES, AND MERRIT N. WOODRUFF, OF SAME PLACE.

## DIES FOR FORMING KING-BOLTS.

SPECIFICATION forming part of Letters Patent No. 234,059, dated November 2, 1880.

Application filed May 4, 1880. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM PEARCE, of Southington, in the county of Hartford, and in the State of Connecticut, have invented certain new and useful Improvements in Dies for Forming King-Bolts; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my forming-dies separated from each other. Fig. 2 is a like view of my trimming-dies separated from each other. Fig. 3 is a perspective view of the upper side of the king-bolt as it leaves said forming-dies. Fig. 4 is a like view of the lower side of the same, and Figs. 5 and 6 are respectively perspective views of the upper and lower sides of said king-bolt after having passed through the trimming-dies.

Letters of like name and kind refer to like parts in each of the figures.

In the manufacture of clip king-bolts it has heretofore been the custom to round the ends of the clip for threading by separate and entirely different dies from those used for forming the remainder of the king-bolt—an operation which not only required separate and distinctive mechanism, but rendered necessary the reheating of said king-bolt.

To render unnecessary this second operation, and thereby to lessen the expense of making clip king-bolts, is the design of my invention, which consists, principally, in the construction and combination of the forming-dies, substantially as and for the purpose hereinafter shown.

It consists, further, in the construction and combination of the trimming-dies, substantially as and for the purpose hereinafter set forth.

It consists, finally, in the forming and trimming dies, constructed as shown, and operating successively in the manner and for the purpose substantially as hereinafter described.

In the annexed drawings, A represents the lower forming-die, which has a rectangular form in plan view, is provided at its center with a round vertical opening,  $a$ , for the reception of the body of a king-bolt, B, has a transverse half-round groove,  $a'$ , that intersects said open-

ing for the reception of the wings  $b$  of the said clip, and, extending longitudinally through the center and intersecting said opening  $a$ , has a second half-round groove,  $a^2$ , which decreases in width and depth from said opening outward in each direction, and is for the reception of the arms  $b'$  of said clip. Midway between the opening  $a$  and each end of the die A the face of the latter is sunk about one-fourth of an inch below the central portion, and within such sunk part  $a^3$  is formed a half-round groove,  $a^4$ , which corresponds in transverse dimensions to the diameter of the bolt portion  $b^2$  of the clip, and extends from the end of said die longitudinally inward, and terminates within the groove  $a^2$ , the portion of said groove  $a^4$  within the latter having regularly-decreasing width and depth from its outer portion inward until it runs out, as seen in Fig. 1. At its upper end the central opening,  $a$ , is rounded upward and outward so as to form the usual half-round fillet  $b^3$  at the intersection of the body of the king-bolt with the clip.

The upper die, C, corresponds in horizontal shape and dimensions to the like features of the die A, and at its center is provided with a transverse half-round rib,  $c$ , which corresponds in dimensions to and fits into the groove  $a'$  of said die, while at each end said die C has a downward projection,  $c'$ , that corresponds to and fills the sunk portion  $a^3$  of the same, and is provided with a half-round groove,  $c^2$ , which corresponds in dimensions and location to the groove  $a^4$ .

A small V-shaped groove,  $c^3$ , is formed in the rib  $c$  at the center of the die C and in line with its longitudinal axis, so as to form the usual transverse rib  $b^4$  within the clip. This completes said die, which, in connection with the die A, is used as follows, viz: A blank king-bolt, properly heated, is placed within the lower die, A, the body of said blank being within the opening  $a$  and the parts to form the clip-arms in line with the grooves  $a^2$ , after which the upper die, C, is caused to impinge one or more times upon said blank until the latter has been forced into the cavities formed within said lower die and assumes the shape shown in Figs. 3 and 4. The king-bolt is now ready for the trimming-dies, which are formed as



follows, viz: The lower or female die, D, has the same width as the die A, but is some three inches longer, and within its face has a central groove,  $d$ , which corresponds in size and shape to the groove  $a'$ , and is provided with two transverse right-angled grooves,  $d'$ , that correspond in size and location to the sunk portions  $a^3$  of said die A. At the longitudinal axis of the die D is provided an opening,  $d^2$ , which exactly corresponds in horizontal size and shape to the outlines of the clip portion of the finished king-bolt, while from each end of said opening a half-round groove,  $d^3$ , corresponding in width therewith, extends longitudinally outward to the end of the die. The upper or male trimming-die, E, has horizontally the size and shape of the opening  $d^2$  of the lower die, D, so as to be capable of passing downward into the same, while its lower surface has longitudinally exactly the reverse of the shape of the upper face of said die, and within each of its ends is provided with a half-round groove,  $e$ , that corresponds to the size of the groove  $d^3$ . The partly-finished king-bolt B is now placed upon the die D, the body being contained within the opening  $d^2$  and the ends of its bolt portions  $b^2$  resting within the grooves  $d^3$ , after which the upper die, E, is moved downward and, forcing said king-bolt through said opening  $d^2$ , removes all surplus metal around the sides and at the ends of the clip, and leaves said king-bolt in the shape

shown Figs. 5 and 6, ready for cutting threads upon the parts  $b^2$ .

The operations described can be performed at one heating of the king-bolt, and enable an important saving in expense to be effected over the method heretofore employed.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. The die A, provided with the central opening,  $a$ , transverse groove  $a'$ , and longitudinal grooves  $a^2$  and  $a^4$ , in combination with the die C, having the transverse rib  $c$  and longitudinal grooves  $c^2$ , substantially as and for the purpose shown.

2. The die D, provided with the transverse grooves  $d$  and  $d'$ , opening  $d^2$ , and longitudinal grooves  $d^3$ , in combination with the die E, constructed as shown, and having the longitudinal grooves  $e$ , substantially as and for the purpose set forth.

3. The two pairs of dies A C and D E, jointly, for forming clip king-bolts, constructed and operating substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of April, 1880.

WILLIAM PEARCE.

Witnesses:

FOSTER A. WHITNEY,  
HIRAM FRANCIS.