

F. B. PRINDLE.
Die for Forming King Bolts.

2 Sheets—Sheet 1.

No. 102,707.

Patented May 3, 1870.

Fig. 1.

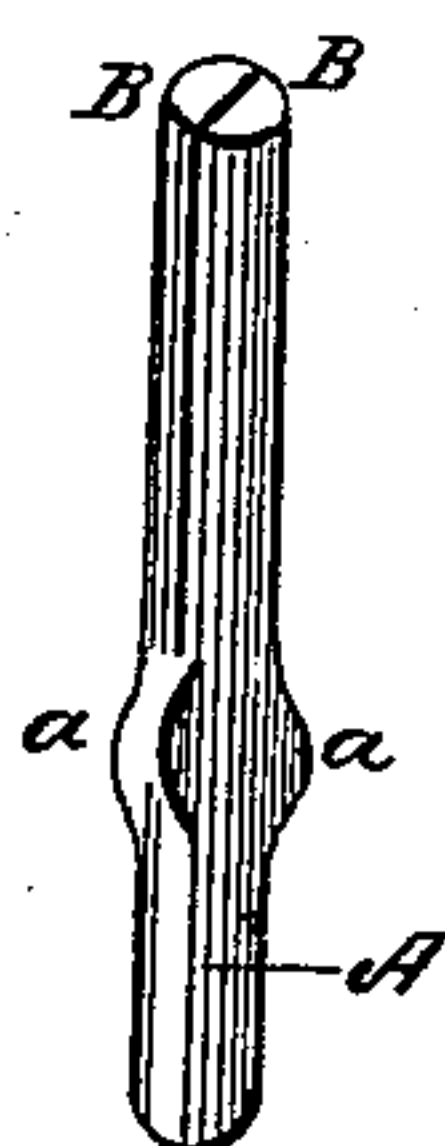


Fig. 5.

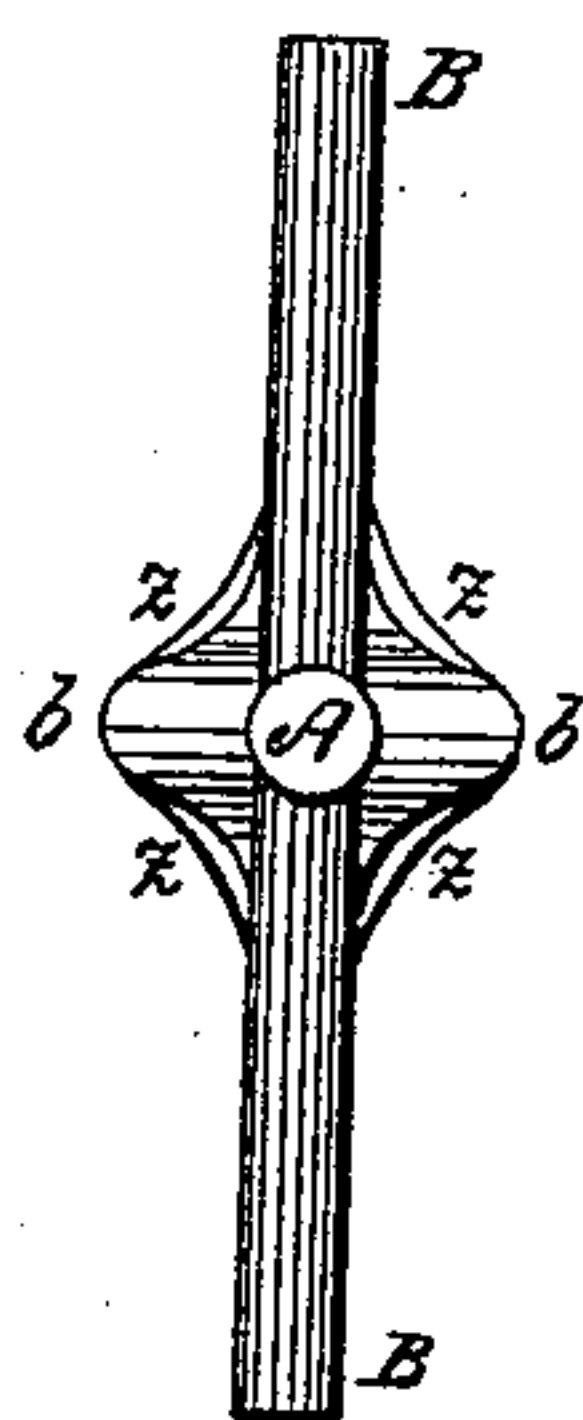


Fig. 2.

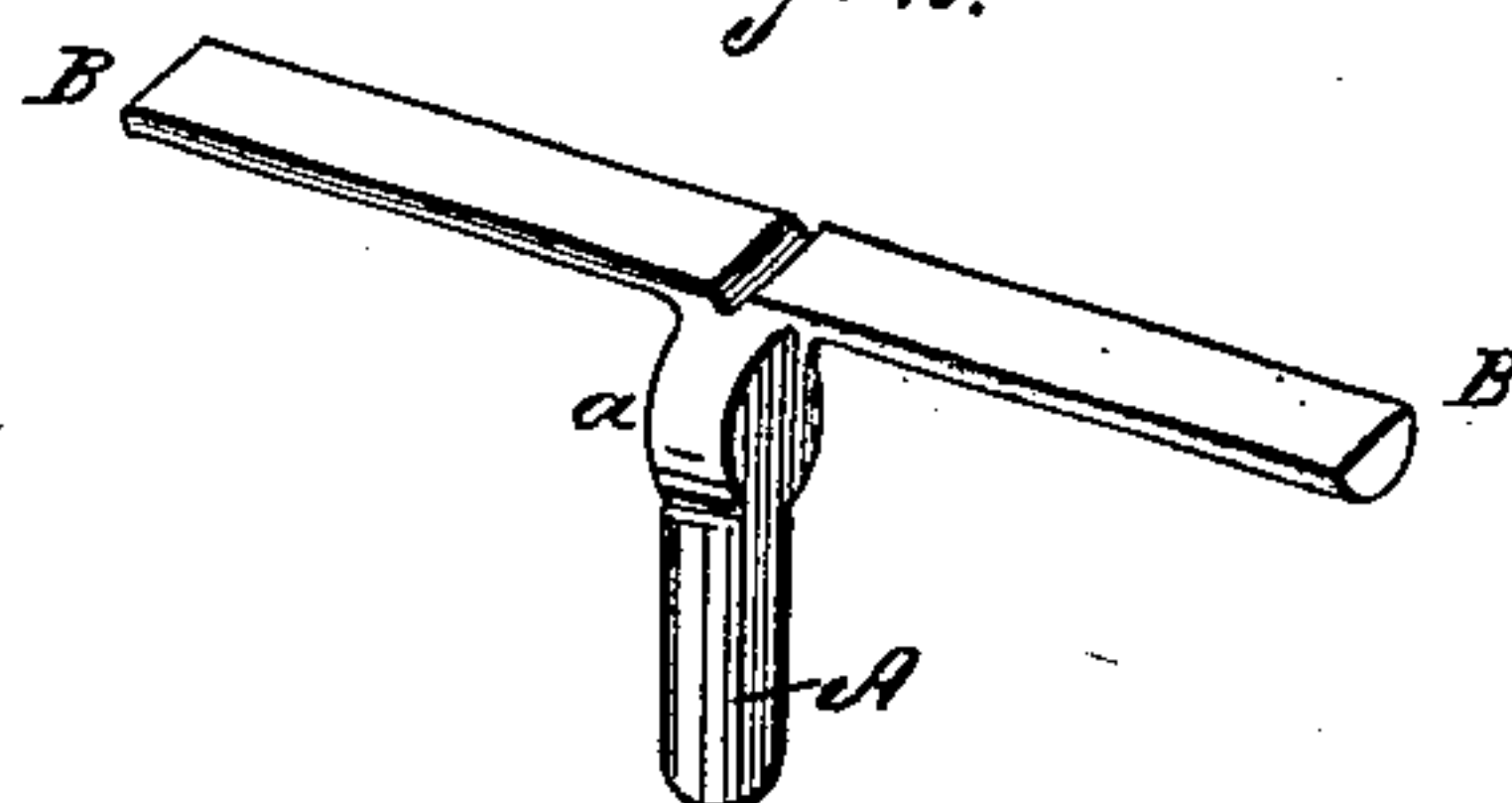


Fig. 6.

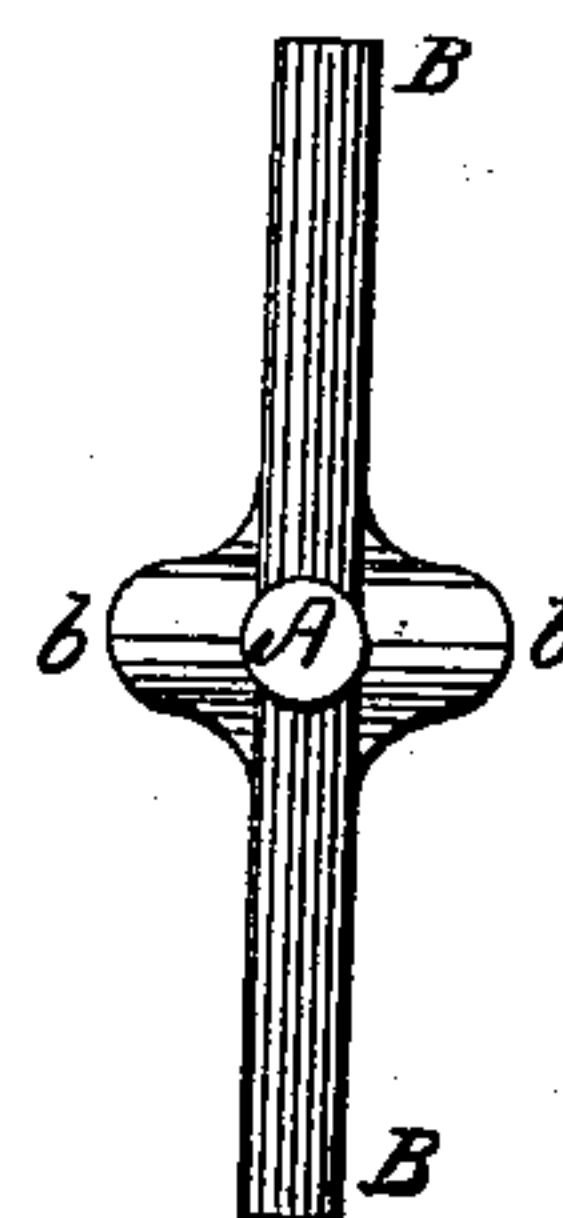


Fig. 3.

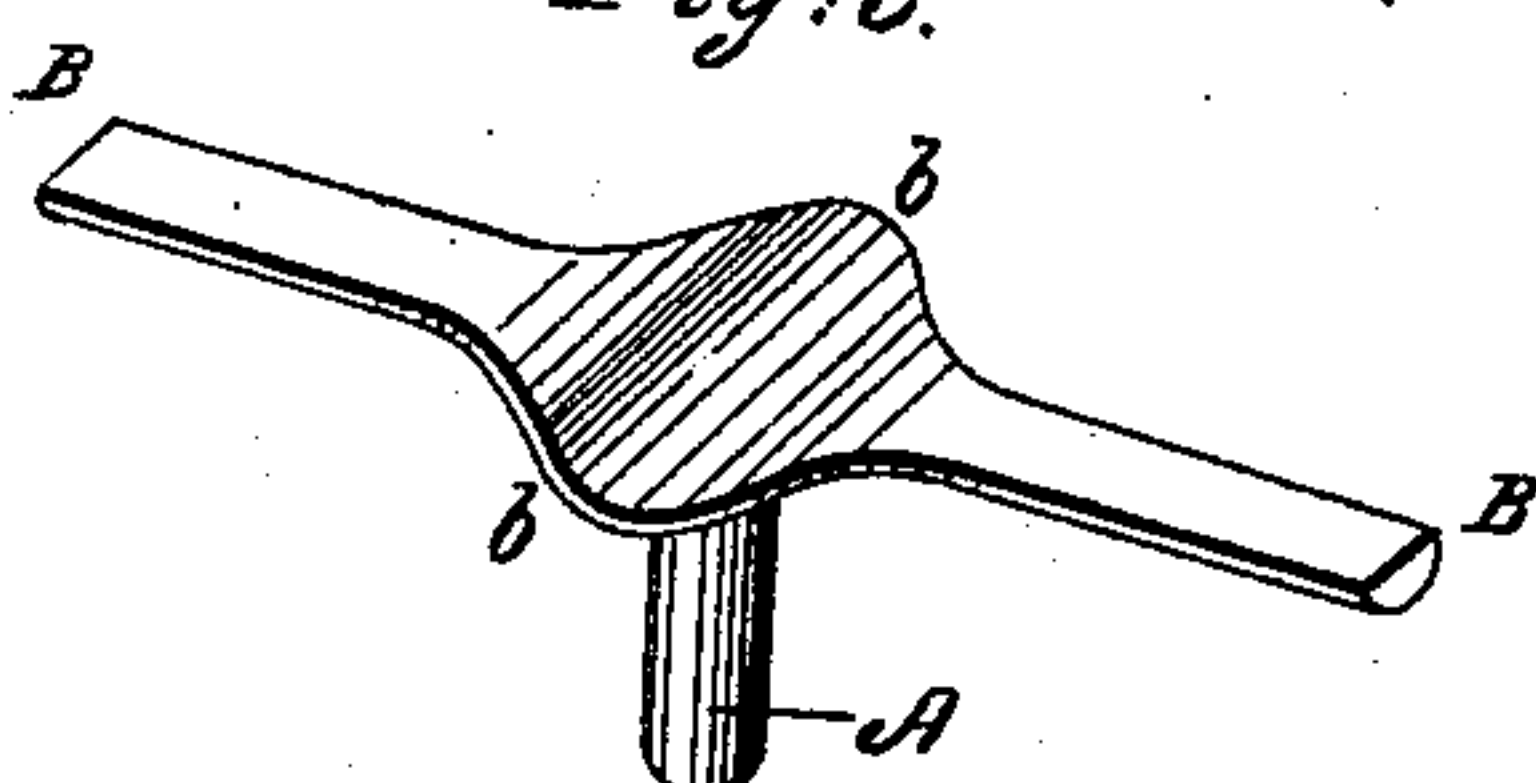
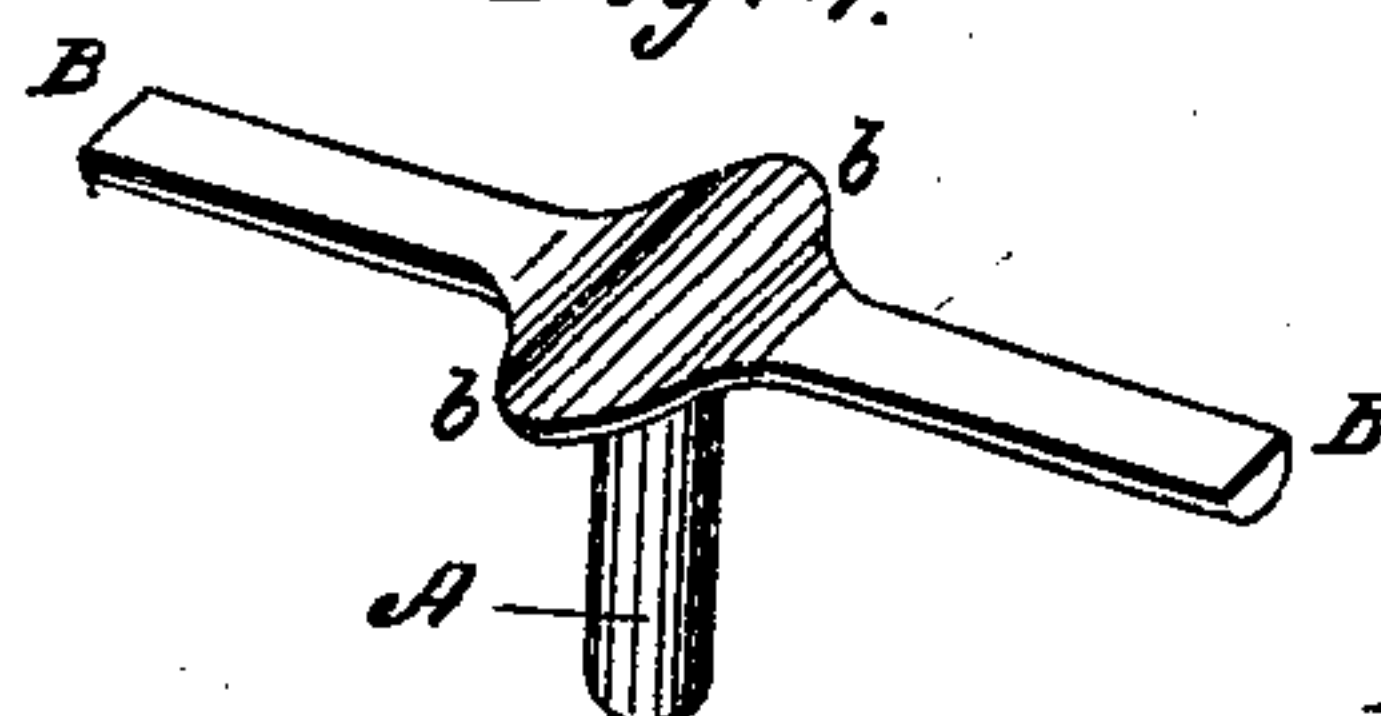


Fig. 4.



Witnesses:
A. C. Merb
Chas. H. Poole.

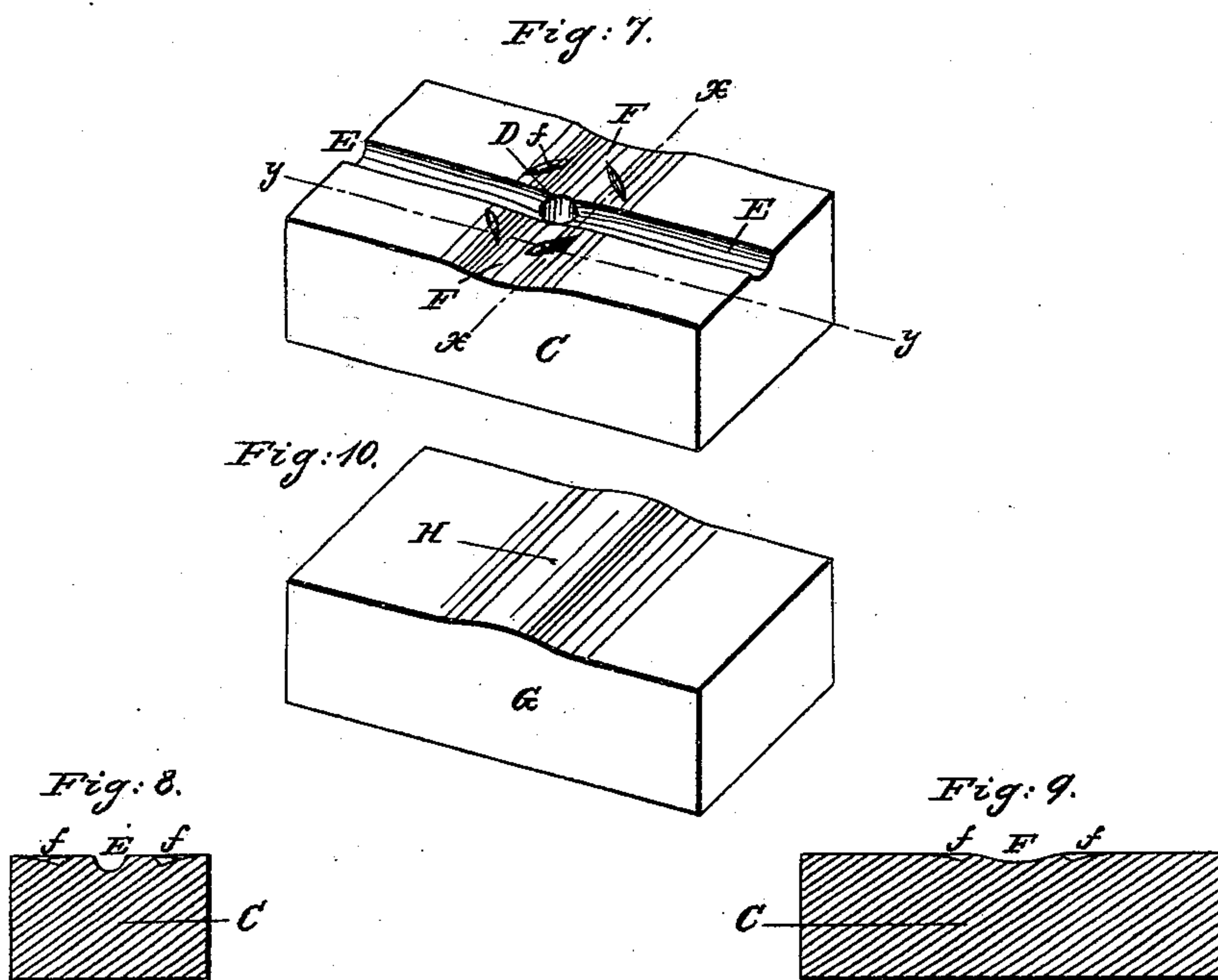
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F. B. PRINDLE.

Die for Forming King Bolts.

No. 102,707.

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Witnesses:
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Chas. H. Poole.

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UNITED STATES PATENT OFFICE.

FRANKLIN B. PRINDLE, OF SOUTHTON, CONNECTICUT.

IMPROVEMENT IN DIES FOR FORMING KING-BOLTS.

Specification forming part of Letters Patent No. 102,707, dated May 3, 1870.

To all whom it may concern:

Be it known that I, FRANKLIN B. PRINDLE, of Southington, in the county of Hartford, and in the State of Connecticut, have invented certain new and useful Improvements in the Method and Dies for Forming Clip 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—

Figures 1 to 4 show the bolt in its progressive stages. Fig. 5 is a bottom view of the bolt as shown in Fig. 3. Fig. 6 is a like view of the same as shown in Fig. 4. Fig. 7 is a perspective view of the upper or face side of the forming-die. Figs. 8 and 9 are vertical cross-sections of the same on the lines *xx* and *yy* of Fig. 7. Fig. 10 is a perspective view of the face side of the swage or upper die.

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

My invention has for its object the forming of clip king-bolts in a speedy and economical manner; and to this end it consists, principally, in the employment of forming-dies having a peculiar shape, by means of which great economy in time and labor is obtained, and a better and more accurate king-bolt constructed.

It also consists in a blank of peculiar construction formed of a round bar of iron, as more particularly hereinafter set forth.

In the construction of clip king-bolts by my method I make use of round bar-iron having a size slightly greater than the finished bolt, which iron, being cut into suitable lengths, is first upset, so as to form two ears, *a*, Fig. 1, upon opposite sides thereof, and about one-third of the distance from the lower end, after which it is split longitudinally from its upper end to and in a line with said ears. The divided sections *B* being bent outward at a right angle to the shank *A*, and in a line with each other, as shown in Fig. 2, the blank is ready for the forming-dies, which are constructed as follows:

The principal or lower die, *C*, consists of a rectangular block of steel, having in and through its center, vertically, a round opening, *D*, of a suitable size to receive the shank of the bolt.

Extending longitudinally across the face of the die *C* at its center, transversely, is a half-round groove, *E*, corresponding in width with

the opening *D*, while a second groove, *F*, formed upon a larger circle than the first, extends across said face in an opposite direction, or at a right angle to said groove *E*. Both of the grooves *E* and *F* dish downward toward the center of the die, while the former, *E*, is also inclined slightly downward and outward from near its outer ends.

G represents a male or upper die corresponding in size with the female die *C*, and having upon its otherwise plain lower surface or face a raised part, *H*, which raised part fits into the groove *F*; but being straight longitudinally, said raised part fills said groove only at its outer ends. As thus constructed, the dies are used in connection with a drop-press, the female die *C* being secured to or within the bed-plate, while the male die *G* is attached to and operated by means of a ram or drop placed immediately above said bed-plate, so as to cause said dies to exactly coincide with each other. The blank shown in Fig. 2, being suitably heated, is placed with its shank *A* within the opening *D*, and its sections or arms *B* immediately over the groove *E*, and the male die or swage *G* caused to impinge its upper surface with sufficient force to cause it to conform to and fill said female die, by which operation the ears *a* are spread horizontally, so as to form the wings *b*, (shown in the succeeding figures,) while the blank receives the form shown in Fig. 3. It being impossible to so adjust the quantity of metal used and to control its action sufficiently to always have the exact amount contained in the ears *a* that is necessary to form the wings *b*, in order to insure a perfect form to the latter, it becomes necessary to have a small quantity of surplus material, which surplus must spread out horizontally beyond said wings. In order to provide space for the extra material, and at the same time preserve the exact shape and thickness of the wings, the face of the lower die, *C*, immediately outside of the finishing-line of said wings, is provided with four grooves, *f*, which are sunk to a sufficient depth so that when the upper die or swage, *G*, is forced downward until its face rests upon the face of said lower die, the blank placed between said dies will exactly fill the desired space, and all surplus material in the ears *a* will be pressed outward beyond the finishing-line of the wings into the grooves *f*, giving to the blank the

form shown in Fig. 5. To complete the bolt, the edges of the ears and the ends and edges of the clip-arms are trimmed in suitable dies, and said arms bent upward to position.

The especial advantages possessed by this invention are, first, the peculiar construction of the swaging-dies enables the blank to be more perfectly and easily formed than by other means, and also permits the surplus stock to escape, so as to present no obstacle to the free action of said dies, while from the peculiar shape of the trimming-dies great ease and perfection of work are secured, together with great durability of said dies; second, the method of forming the blank and the successive stages through which it is caused to pass secure the production of a perfect bolt in a shorter time and with less waste of material than has heretofore been possible.

Having thus fully set forth the nature and

merits of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The hereinbefore-described dies C and G, for forming clip king-bolts, C being provided with the grooves E, F, and *f*, and G having the swell or protuberance H, as and for the purpose set forth.

2. The hereinbefore-described blank for forming a clip king-bolt, Fig. 1, provided with the ears *a* and *a*, and divided longitudinally from its upper end to said ears, substantially as shown, and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of February, 1870.

F. B. PRINDLE.

Witnesses:

HENRY R. BRADLEY,
S. M. BARNES.