

(No Model.)

R. L. BARCLAY.
MEANS FOR MANUFACTURING TWIST DRILLS.

No. 603,462.

Patented May 3, 1898.

Fig. 1.

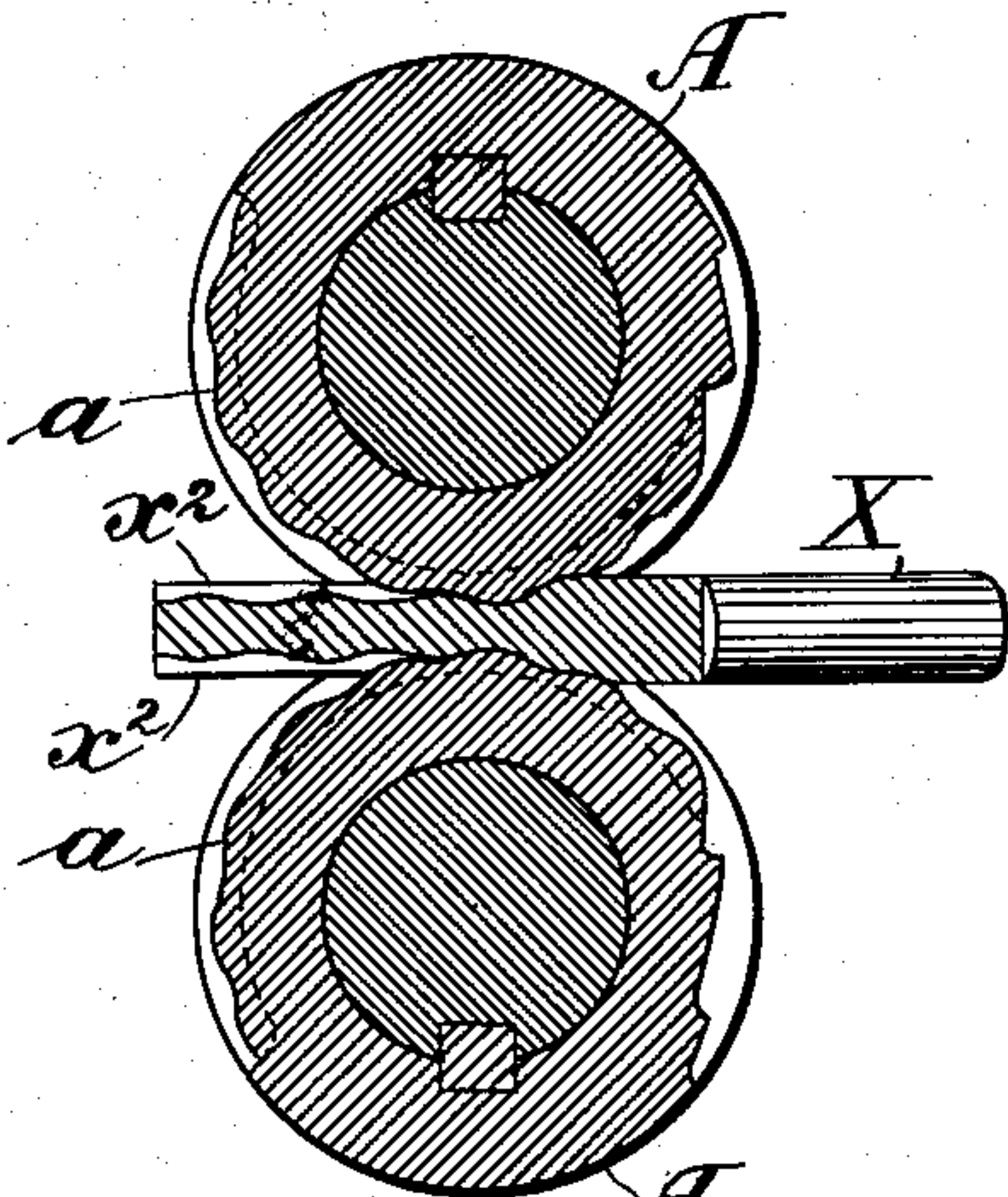


Fig. 1^a.

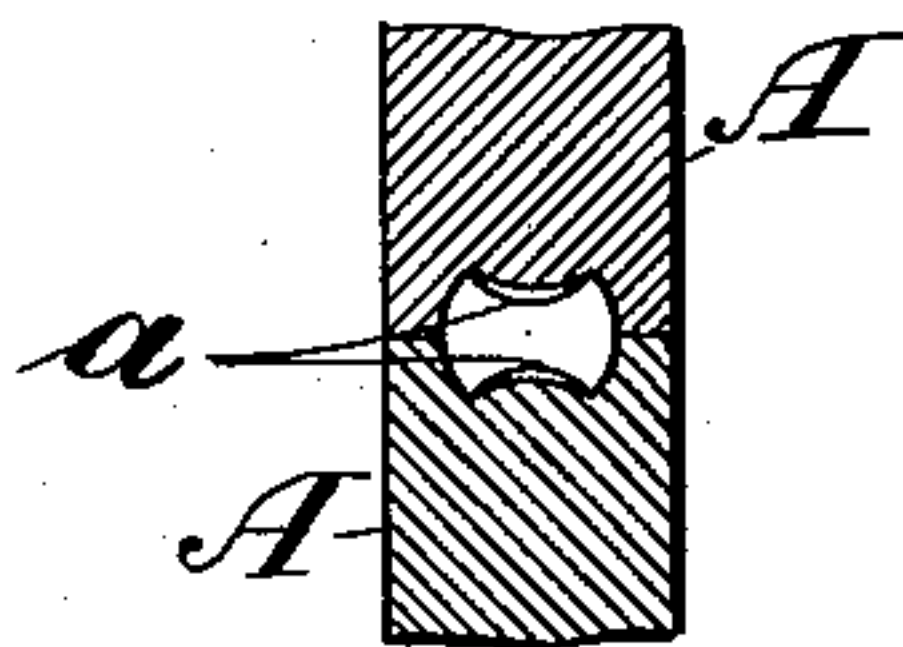


Fig. 2.

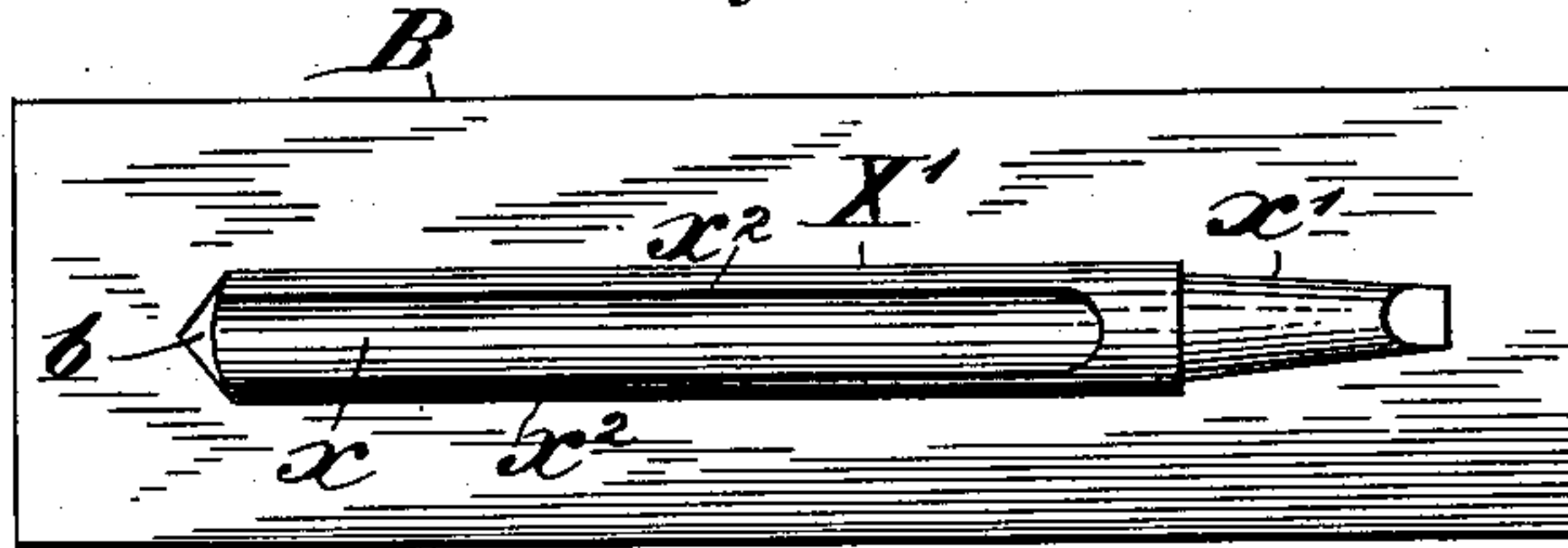


Fig. 3.

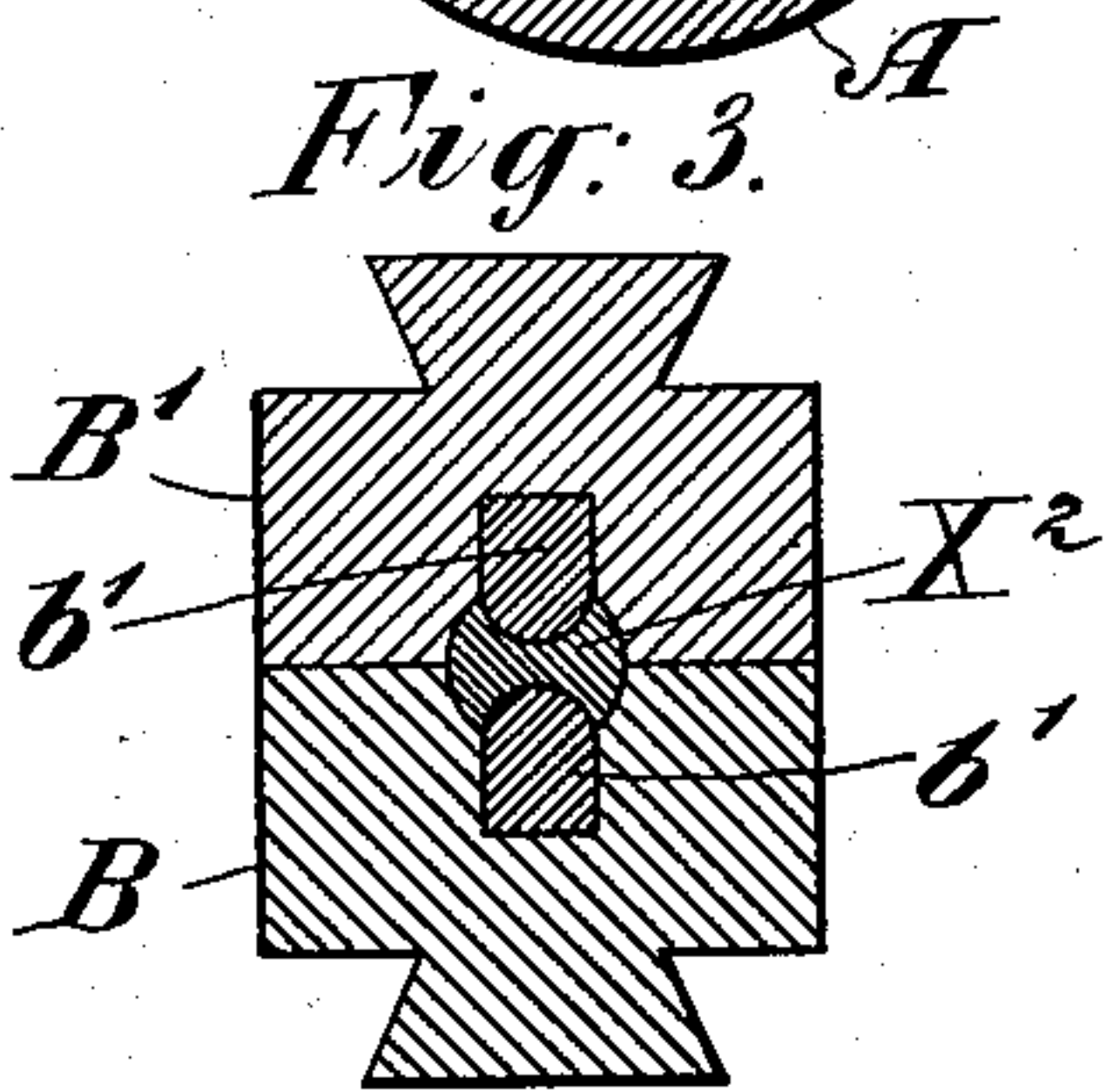


Fig. 4.

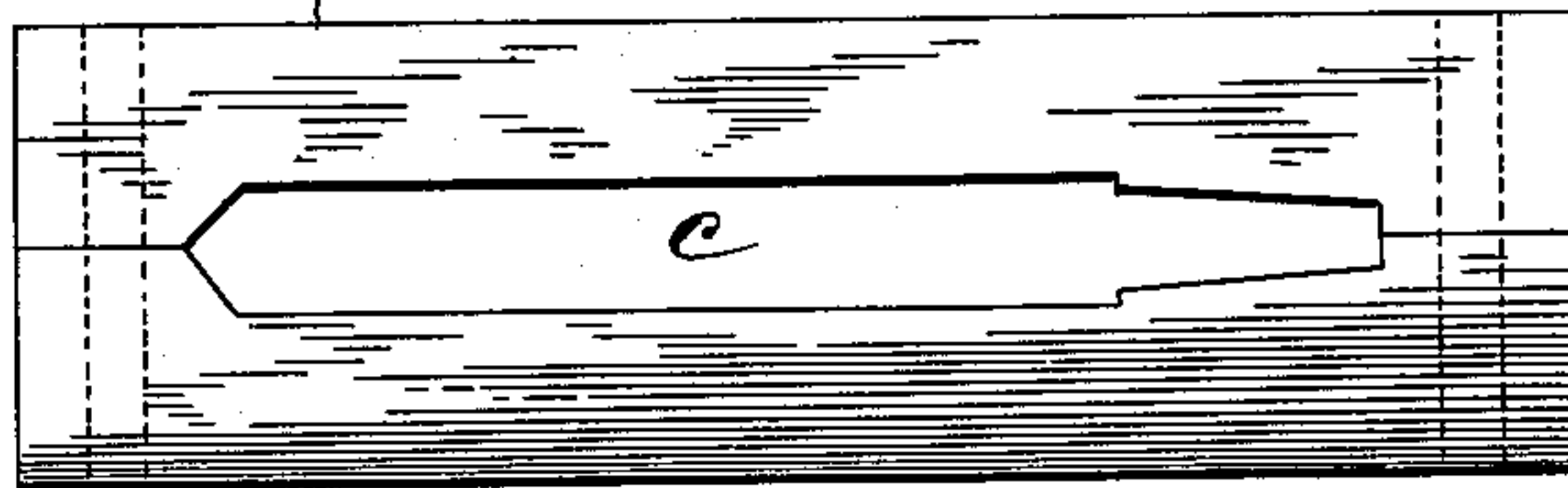


Fig. 5.

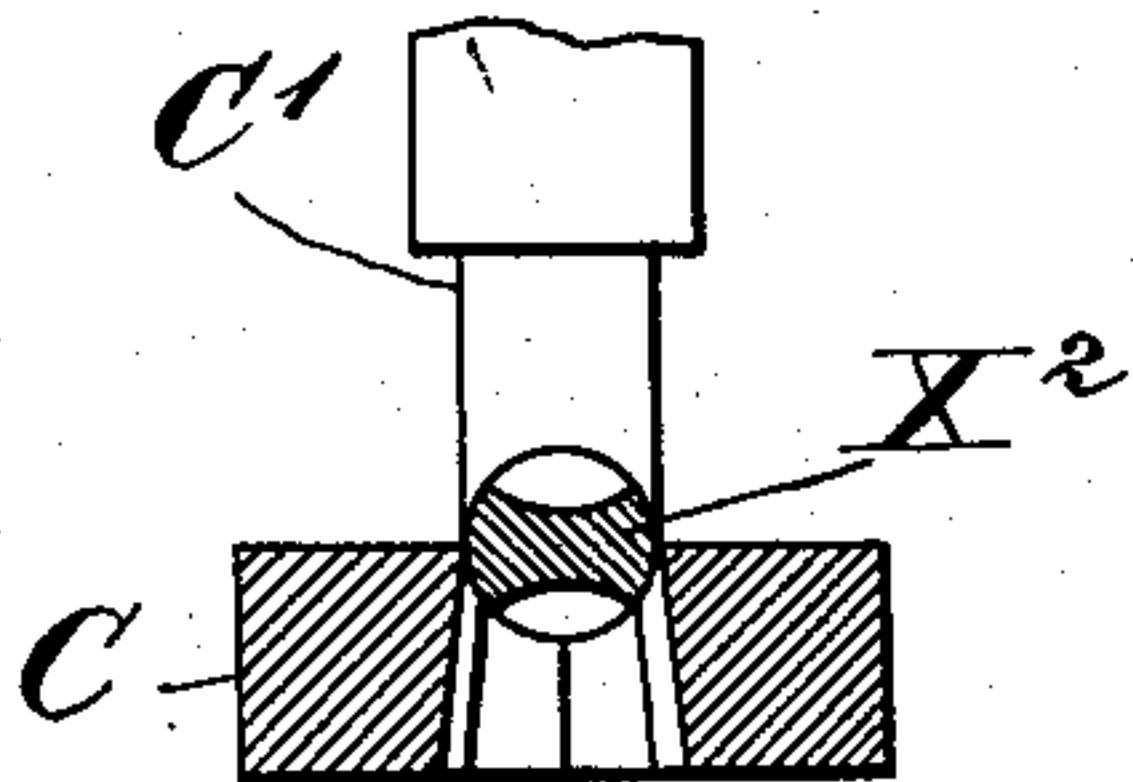


Fig. 6.

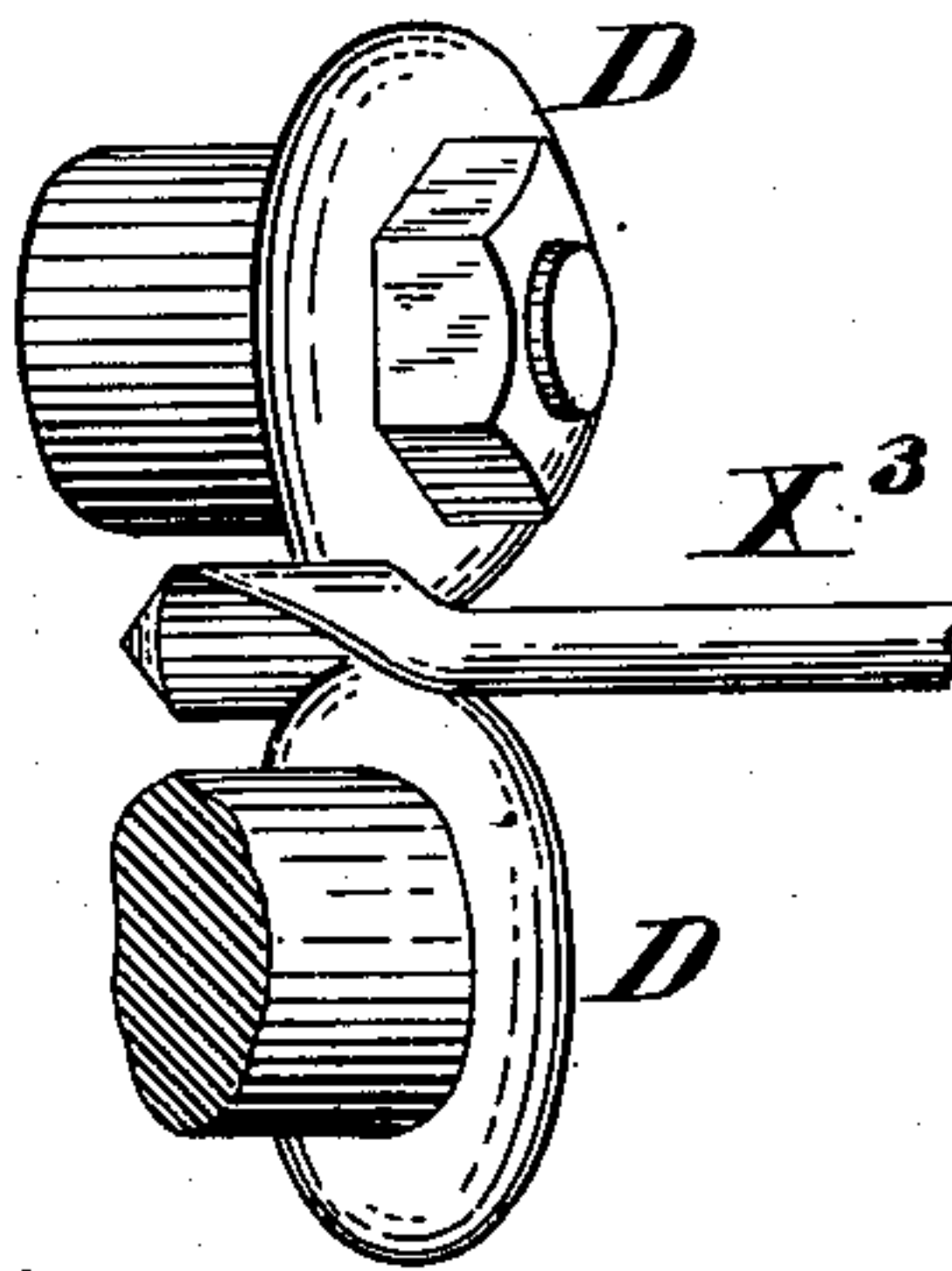


Fig. 7.



WITNESSES:

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MEANS FOR MANUFACTURING TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 603,462, dated May 3, 1898.

Application filed June 8, 1896. Serial No. 594,770. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LAYFETTE BARCLAY, a citizen of the United States, residing at Plattekill, in the county of Ulster and State of New York, have invented certain Improvements in Means Employed in the Manufacture of Twist-Drills, of which the following is a specification.

This invention relates to the manufacture of twist-drills, particularly of the larger sizes and from Mushet steel; and the object is to provide rolls capable of rolling in the flutes on the blank at one pass. The means for finishing the drill after the primary rolling are also shown and described for purposes of illustration, although these finishing devices form no essential part of this application.

In the accompanying drawings, which illustrate my invention, Figure 1 is a cross-section of the rolls through which the drill-blank is first passed for forming the flutes therein and the shank thereon. This view shows the blank in the rolls. Fig. 1^a is a fragmentary section of the rolls seen in Fig. 1, showing the form of the corrugations in the die-faces of the rolls which form the flutes. Fig. 2 is a plan view of the lower die of the pair of drop-dies in which the drill-blank is further finished and pointed by the second operation thereon. The drill-blank, as yet unfinished, is represented as resting in the hollow of the lower die. Fig. 3 is a cross-section of the drop-dies, showing the drill-blank therein. Fig. 4 is a plan view of the female trimming-die for removing the fin formed on the drill-blank by the drop-dies. This trimming is the third operation. Fig. 5 is a cross-section of the trimming-dies, showing the drill-blank in position therein. Fig. 6 is a view showing the rolls for twisting the drill-blank, this being the final operation thereon. Fig. 7 shows the finished drill.

In the drawings, X in Fig. 1 represents the blank from which the drill is to be formed. This may be a plain bar of Mushet steel properly heated for rolling.

X' in Fig. 2 represents the rolled blank as yet without a point and requiring the finishing with the drop-dies.

X² in Figs. 3 and 5 indicates the finished and pointed blank ready to be trimmed.

X³ in Fig. 6 represents the finished and trimmed blank in the twisting-rolls, and X⁴ represents the completed drill ready for use.

In Figs. 1 and 1^a, A A represent the two rolls which form the longitudinal flutes α , Fig. 2, in the drill-blank and also form the tapered shank α' on the blank. To form the longitudinal grooves or flutes α and at the same time to cause the rolls to draw the blank X through their bite without slip, each roll has formed on it a corrugated die-face or circumferential rib α , which is in cross-section (see Fig. 1^a) convex and which is corrugated or wavy in the direction of its length, as clearly seen in Fig. 1. This corrugation of the die-face α forms, of course, a similar corrugation at the bottom of the flute or groove in the blank, but this irregularity does not extend up to the cutting edges α^2 , Figs. 1 and 2, of the drill-blank, these edges being kept true and straight. This is effected, as indicated in Fig. 1^a, by causing the corrugations to run out at the lateral edges of the die-face α , where the roll is grooved to form the cutting edges of the drill. The drill-blank X being passed through the rolls A A, it acquires the form seen in Fig. 2. This blank X' has no point as yet, and the flutes therein will have a slightly wavy or slightly corrugated surface.

The second operation is performed with drop-dies B B'. (Seen in Figs. 2 and 3.) These I call "pointing and finishing" dies. The drill-blank X', hot from the rolls A, is laid in the lower die B, and the die B' is dropped thereon. This operation effaces at one drop or blow the corrugations in the flutes, and it swages out the metal to fill the point-forming space b in the dies. (Seen in Fig. 2.) The drill-blank X² after removal from the finishing drop-dies B will usually have at each side a fin, more or less material, and to remove this fin the blank while still hot is passed through shearing-dies C C'. (Seen in Figs. 4 and 5.) Fig. 4 shows a female die C in plan, having the aperture c to fit the blank, and Fig. 5 is a cross-section of the dies and a drill-blank in position therein for the shearing operation. The die C' descends and forces the blank through, shearing off the fin. After the drill-blank is sheared or trimmed it is complete, except that it is straight and must be twisted.

This twisting, which is the final operation, is effected by the twisting-rollers D D. (Seen in Fig. 6, where they are represented as operating on a drill-blank which has just been trimmed.) The blank after twisting becomes a completed drill, as seen in Fig. 7, and is ready for use when cooled, no tempering being required if it be made from Mushet steel.

The swaging drop-dies B B' for finishing the primarily-rolled blank may be, and preferably will be, constructed as seen in Fig. 3, where the parts b' , which enter the flutes in the drill-blank and finish them, are represented as detachable and renewable.

Having thus described my invention, I claim—

1. In means for use in making a twist-drill, the rolls A, A, for forming at one pass the flutes or grooves in the blank, said rolls each having a die-face a , convex in cross-section

and corrugated or wavy in the direction of its length, substantially as set forth.

2. In means for use in making a twist-drill, the rolls A, A, for forming the longitudinal flutes or grooves in the opposite faces of the blank, said rolls having each a die-face a , convex in cross-section and corrugated or wavy in the direction of its length, said corrugations running out at the lateral edges of the die-face in order that the cutting edges of the drill along the margins of the flute therein may be formed straight and true, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ROBERT LAYFETTE BARCLAY.

Witnesses:

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GEO. S. PRICE.