(No Model.)

A. B. SHIPPEE.

DIE FOR SWAGING TWIST DRILLS.

No. 468,469. Patented Feb. 9, 1892.

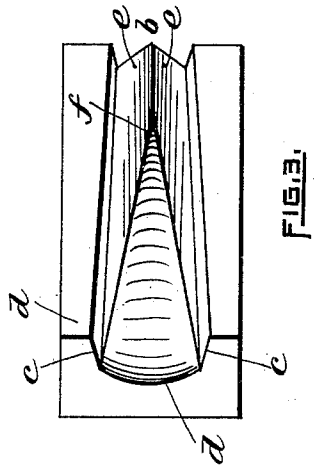

FIG. 3.

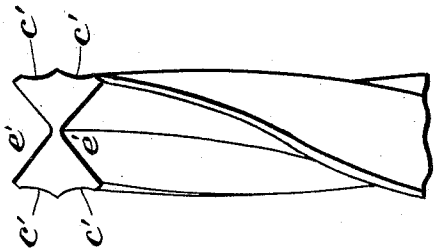

FIG. 5.

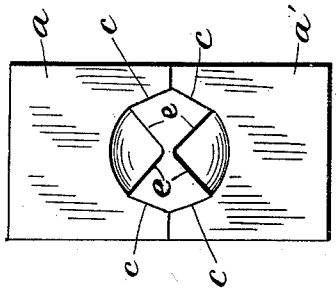

FIG. 2.

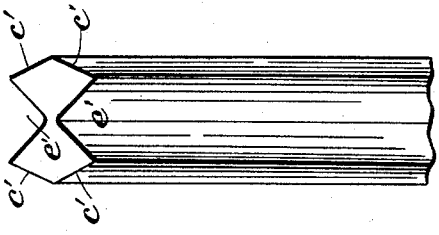

FIG. 4.

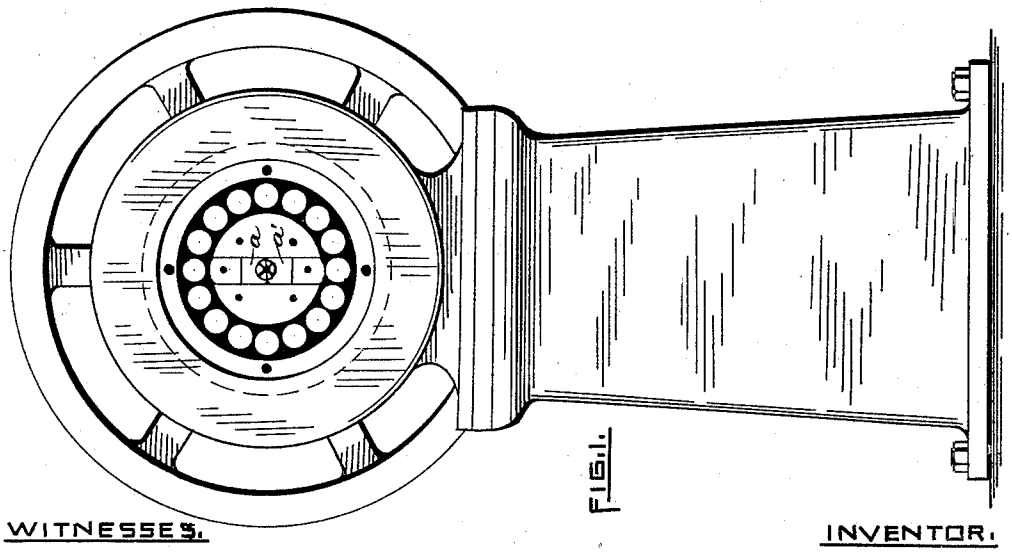

FIG. 1.

WITNESSES.

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DIE FOR SWAGING TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 468,469, dated February 9, 1892.

Application filed November 10, 1891. Serial No. 411,448. (No model.)

To all whom it may concern:

Be it known that I, AARON B. SHIPPEE, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Dies for Swaging Twist-Drills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention is an improvement in dies used for the purpose of swaging the grooves in twist-drill blanks to be afterward made into a spiral form by twisting.

It consists in so shaping the working surfaces of the dies as to be able to swage both the main delivery-grooves and the relief or oiling grooves on the outside of the wings or outer surface of the drill at the same time, with only two dies to perform the operation, instead of the four that would be required in the usual way. It is fully illustrated in the accompanying drawings.

Figure 1 shows an end view of the improved dies in a rotary swaging-machine constructed on the plan disclosed in my application for United States Letters Patent, Serial No. 393,677, filed May 22, 1891. Fig. 2 is an enlarged end view of the dies separate from the machine. Fig. 3 is a perspective view of the face and end of one of the dies. Fig. 4 is a representation of the grooved or fluted portion of a swaged drill-blank before it is made spiral, with a sectional diagram at the end, showing the form in section in connection with a side view. Fig. 5 represents a swaged and twisted drill, with a sectional diagram showing the change in the form of the grooves or flutes made by the process of making it spiral by twisting.

The two dies *a a'* are made exactly alike that the drill swaged between them may be the same on both sides. They consist of two rectangular blocks of steel having longitudinal recesses in the sides that are to face each other. The recesses extend through their whole length and are nearly in the shape in cross-section of the letter M or W inverted. The center angles *e e*, forming the two main grooves *e' e'* of the drill, and the two sides *c c*, made more nearly square to the face of the die, shape the side planes *c' c'* of the drill when swaged. This form is carried through the whole length of the dies on the side planes *c c*, but gradually smaller toward the back ends. The center portion of each die, comprising the faces *e e*, is cut all away at the point *d* and slopes gradually up to full height at the point *f* to finish the grooves *e' e'* in the drill to the proper depth. This cutting away of the center in front is for the purpose of allowing the drill-blank to enter between them, and as it is pushed forward it will be gradually brought to shape by the incline from *d* to *f*. These dies are intended to be used in a rotary swaging-machine like that described in my said application, Serial No. 393,677, in which the dies receive rapidly-repeated blows from the rolls around them and gradually reduce the drill-blank that is pushed in between them to the proper form and size.

The shape of the drill-blank after swaging and before twisting to a spiral is represented in Fig. 4, where the end diagram shows the shape of a section of the blank before being made spiral. Fig. 5 represents the same blank, Fig. 4, after it has been made spiral in form, the diagram at the end showing in section the changes in the shape of the planes or faces *c' c'*, produced by spiraling the drill-blank.

As stated, the dies are more especially adapted to rotary swaging-machines; but they may be used in other swaging-machines or in trip-hammers having proper arrangements for holding them.

In making the smaller sizes of drills the swaging to the proper size may be all done at one operation; but in the larger sizes of drills the amount of metal to be disposed of in swaging is increased so much that it is necessary to use a succession of dies, which may be of the same shape practically as regards the side planes *c c*, as shown in Fig. 3, while the center with faces *e e* would not be made full at the back end of the dies first used, but raised higher in each succeeding set, the last being of full size to finish the swaging.

Having thus described my improved dies, I claim as my invention and desire to secure by Letters Patent—

A die for swaging twist-drills, having two tapering grooves in its face extending the

whole length of the die, the outer sides of the grooves being made straight, or nearly so, at an angle of about seventy degrees to the face of the die, and the sides of the ridge formed between said grooves being made straight, or nearly so, at an angle of about forty degrees to the face of the die and having a portion of the central ridge cut away at the larger ends of said grooves, substantially as and for the purpose specified.

A. B. SHIPPEE.

Witnesses:
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