C. F. JACOBSON.

MACHINES FOR MAKING TWIST DRILLS.

No. 190,592. Patented May 8, 1877.

Fig. 2.

Fig. 1.

Fig. 3.

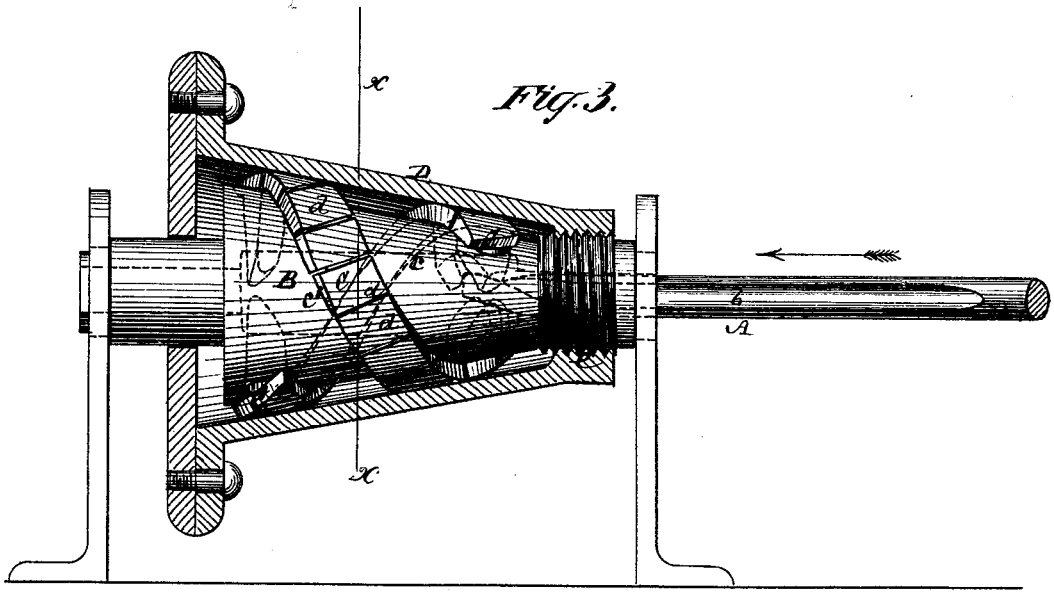

Fig. 7.

Fig. 5.

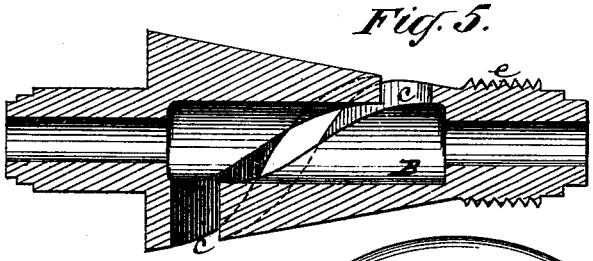

Fig. 4.

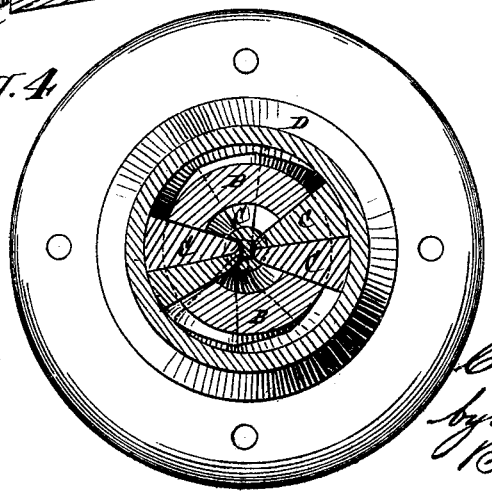

Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

CHRISTIAN F. JACOBSON, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF, JAMES C. JONES, AND GEORGE E. MALTBY, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING TWIST-DRILLS.

Specification forming part of Letters Patent No. **190,592**, dated May 8, 1877; application filed March 29, 1877.

To all whom it may concern:

Be it known that I, CHRISTIAN FREDERICK JACOBSON, of the city, county, and State of New York, have invented certain new and useful Improvements in the Manufacture of Twist-Drills and Screw-Augers, which improvements are fully set forth in the following specification and accompanying drawing.

This invention is mainly designed for the manufacture of twist-drills, and will here be more particularly described with reference to such use; but it is also applicable to the manufacture of screw-augers.

The invention relates to a process or mode of manufacturing twist-drills and screw-augers, in which a drill or auger blank, formed with straight grooves parallel with its axis, is forced longitudinally or in direction of its axis through a spiral die or dies, to give to said blank the required twist of the drill or auger.

The invention consists in certain novel constructions of the devices or means for twisting the blank or blade, the same comprising a hollow and preferably conical die-holder, having longitudinally spiral slots through it, and two or more sectional dies fitted to enter within said slots; also, a hollow outer cone or cylinder, which may either be constructed entire or in sections for holding the dies in place, and may be made adjustable by means of a screw or screw-thread in direction of its length, or otherwise be made longitudinally-adjustable over the die-holder, to regulate the entry of the dies within the die-holder, to adapt the dies to different thicknesses of blanks or blades, and to facilitate the relief of the dies from the work when it is required to withdraw the twisted blank or blade.

By means of this invention a superior drill may be produced in a very rapid manner.

In the accompanying drawing, Figures 1 and 2 represent longitudinal and front end views, respectively, of a double straight-grooved drill-blank prior to being twisted. Fig. 3 is a partially-sectional longitudinal view of a conical die-holder fitted with a series of sectional dies and inclosed by an outer hollow cone, suitable for producing a twist-drill, and showing a drill-blank as in the course of being twisted. Fig. 4 represents a transverse section of the same on the line *x x*. Fig. 5 is a longitudinal section of the spirally-slotted die-holder detached. Fig. 6 represents a transverse section of the drill-blank in its relation with two of the sectional dies while being twisted. Fig. 7 is a longitudinal view of a twist-drill as made by the invention.

A is a drill-blank, having grooves *b b* rolled, drawn, or otherwise formed lengthwise in it.

B is a hollow conical die-holder, constructed with duplicate spiral slots *c c'* through it in direction of its length. Said spiral slots may either be regular or irregular, accordingly as it is required to produce a regular or irregular twist in the drill.

This die-holder B may be supported and held from turning by any suitable means, and serves to carry within its slots *c c'* a series of sectional dies, C C. These dies form two spiral series, which, combined, virtually constitute a single spiral die extending throughout the length of the spiral slots *c c'*. Said dies are fitted freely or loosely within the slots *c c'*, and are of irregular lengths in conformity with the varying diameter of their conical holder B, in order that they may project equally within the conical holder relatively to the axial line of the latter, to insure their action upon the drill-blank as it is forced longitudinally through the holder. Said dies C C may be constructed with heads *d d*, which serve to prevent the dies passing wholly through into the die-holder, and form backs against which pressure may be brought to bear to keep the dies up to their work. This pressure or retention of the dies to their work may be effected by means of an outer hollow cone or case, D, arranged to inclose the die-holder and its dies, and to be longitudinally adjustable—as, for instance, by a screw-thread, *e*, at its one end, over or along the die-holder B, so that by turning said case or hollow cone D to the right or to the left it varies the distance. The inner or working ends of the dies C C may be forced outward from the axial line of the die-holder to adapt the dies to different diameters of blanks or different depths of grooves *b* in the blanks. Such longitudinal adjustment of the outer cone or case D may also be used, by relieving the dies, to fa-

cilitate the drawing back or out of the drill after it has been twisted by the dies.

To twist the drill, the outer case or cone D is adjusted to retain the dies C C at their proper distance from the axial line of the die-holder B, when said dies are acting upon the blank through its grooves *b b*. The blank A then having been suitably heated, is introduced within the forward end of the die-holder, and so that the two opposite forward sectional dies C C enter within or fill the straight grooves *b b* of the blank at the front end of the latter. The blank A is then forced longitudinally through the die-holder in direction of the axis of the latter, thereby causing the several sectional dies C C throughout the length of the die-holder successively to be received within the grooves in the blank A, and so twist the blank in conformity with the spiral directions of the dies, after which the outer case or wire D may be slackened to facilitate the extraction of the twist-drill from between the dies and out of the die-holder.

Instead of the drill-blank being forced through the dies, the latter, by means of their holder, may be forced over said blank, which, of course, would be equivalent.

Two sectional dies of increased spiral length may be used for some kinds of work, in place of a greater number of sectional dies, as shown in the drawing.

Furthermore, both the die-holder and its outer case may be built up in sections, if desired, and need not necessarily be conical so far as the construction of a spiral die for twisting a drill in the manner described is concerned.

I claim—

1. The spirally-slotted hollow die-holder, in combination with two or more sectional dies, fitted to enter within said slots, essentially as and for the purpose herein set forth.

2. The combination of an outer and longitudinally-adjustable hollow case or cone, D, the conical and spirally slotted hollow die-holder B, and the sectional dies C C, substantially as specified.

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