(No Model.)

P. D. NICOLS.

Manufacture of Twist Drills.

No. 238,953. **Patented March 15, 1881.**

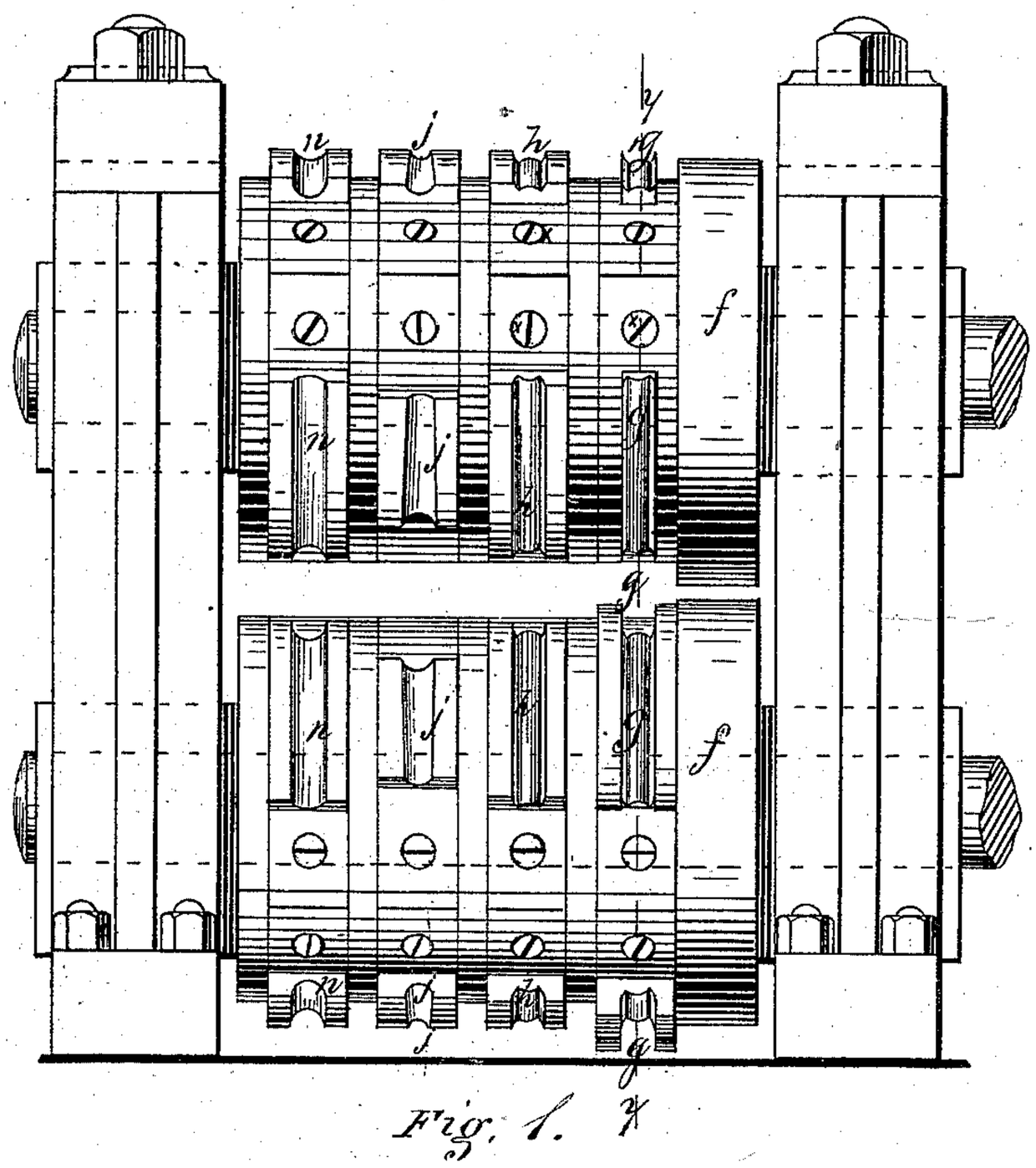

Fig. 1.

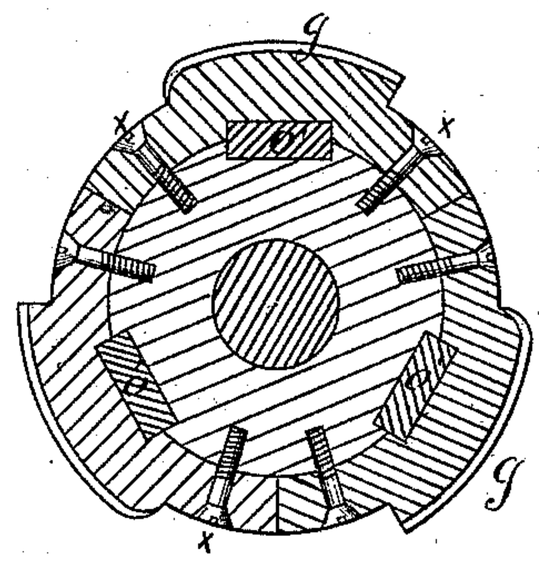

Fig. 4.

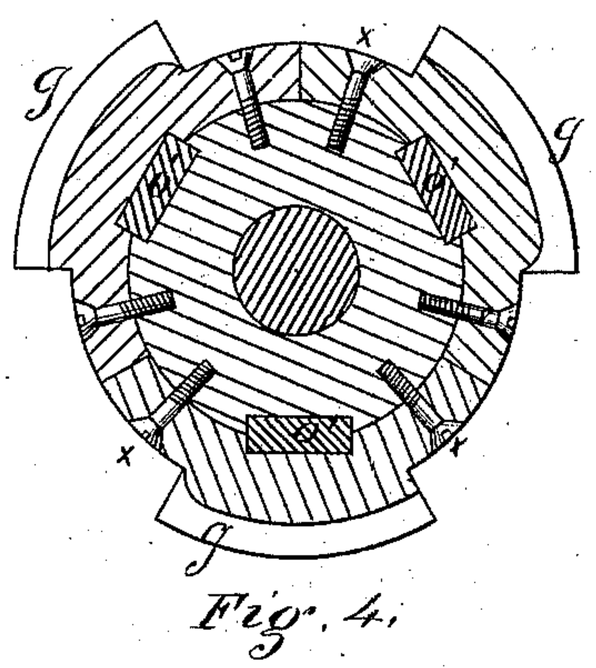

Fig. 5.

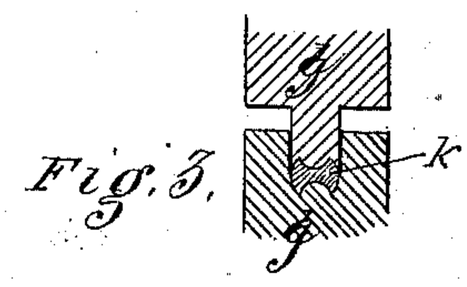

Fig. 3.

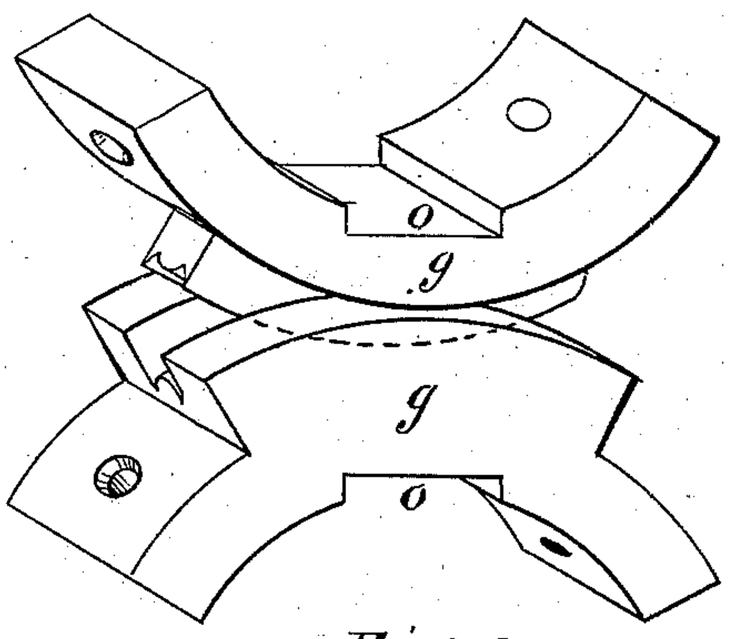

Fig. 2.

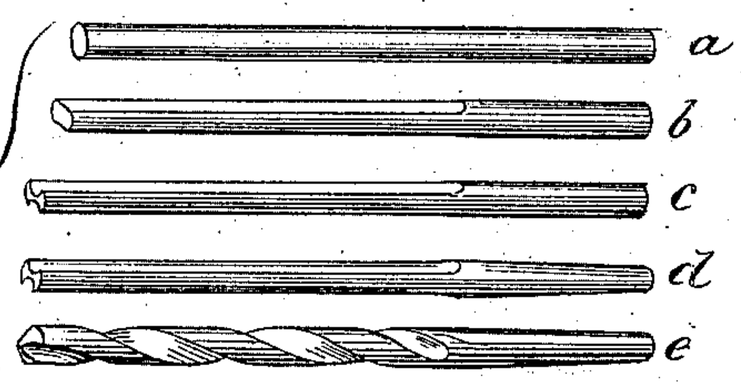

Fig. 6.

Witnesses:
Francis L. Clark,
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Inventor:
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UNITED STATES PATENT OFFICE.

PARSHALL D. NICOLS, OF SEWICKLEY, PENNSYLVANIA.

MANUFACTURE OF TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 238,953, dated March 15, 1881.

Application filed June 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, PARSHALL D. NICOLS, of Sewickley, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Manufacturing Twist-Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Heretofore twist-drills have been made by milling grooves in a solid piece of turned steel, which is not only a slow and a very expensive operation, but diminishes the strength and usefulness of the tool, and on account of the high cost of making limits its use.

The object of my invention is to make a cheaper and more durable twist-drill for drilling metals than has heretofore been manufactured, which I accomplish by reducing a bar of steel (preferably in oscillating rolls) of a suitable size to the required proportions and form by means of dies having a rolling motion, as shown in Figure 1.

Fig. 1 is a front elevation, showing the dies for rolling and forming twist-drills attached to the rolls, or like forms may be cut in a pair of ordinary rolls. Fig. 2 is a perspective view of the dies for rolling twist-drill blanks. Fig. 3 is a sectional view, showing a drill-blank in the dies. Fig. 4 is a vertical section of the rolls through the lines *y y*. Fig. 5 is a perspective view of the dies for rolling taper shanks. Fig. 6 is a perspective view of a bar of steel and its various changes, as indicated by the letters *a b c d e*, down to a finished twist-drill.

In attaching the dies to the rolls I prefer to employ the slat *o* and screws *x x*, as shown in Fig. 4. The dies I prefer using are made from cast-steel having a chilled face, and the grooves in same are turned to the required form and size.

Fig. 1 shows a front elevation of the rolls with the dies attached and ready for use.

In operating the rolls I prefer to employ an oscillating movement giving sufficient bearing-surface to form the length of the grooves shown in Fig. 6, letter *d*. After heating a bar of steel to the proper degree of heat I insert the end of same into pass *f*, which flattens the bar up as far as I wish the grooves on the twist-drill to extend. Next I pass the flattened end of the bar of steel into the groove *g*, which rolls the two reverse concave grooves as shown in Fig. 3. When a sufficient number of passes have been made in groove *g* the bar is then inserted into groove *h*, which is the finishing-groove. In groove *j* I roll the shank, which tapers to the end, as shown in Fig. 6, letter *e*. After this last operation the drill-blank is twisted, ground, polished, and finished, as shown in Fig. 6, letter E. The grooves *g* and *h* have each an annular rib, which is convex in cross-section, these ribs forming the grooves in the flat portion of the bar during the operation already described.

It is known that twisted drills have been made by twisting the grooved portion of a bar, as set forth in patent No. 190,592, and hence I do not make a broad claim to the same.

Having fully described my invention, what I desire to claim and secure by Letters Patent is—

1. In a machine for forming blanks for twist-drills, a pair of oscillating rollers having the flat pass *f* for flattening the bar, the grooves *g h*, with annular ribs for forming grooves in the flattened bar, and the tapering grooves *j* for giving a taper to the unflattened or shank portion of the blank, substantially as herein shown and described.

2. The combination, with a pair of oscillating rolls with a pass and grooves for flattening and forming grooves in a metal bar, of dies secured to said grooves and formed with tapering grooves for tapering the end of a bar previously passed a portion of its length only through said pass and grooves, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of June, 1880.

PARSHALL D. NICOLS.

Witnesses:
M. B. JOHNSON,
T. WALES WEBB.