

(No Model.)

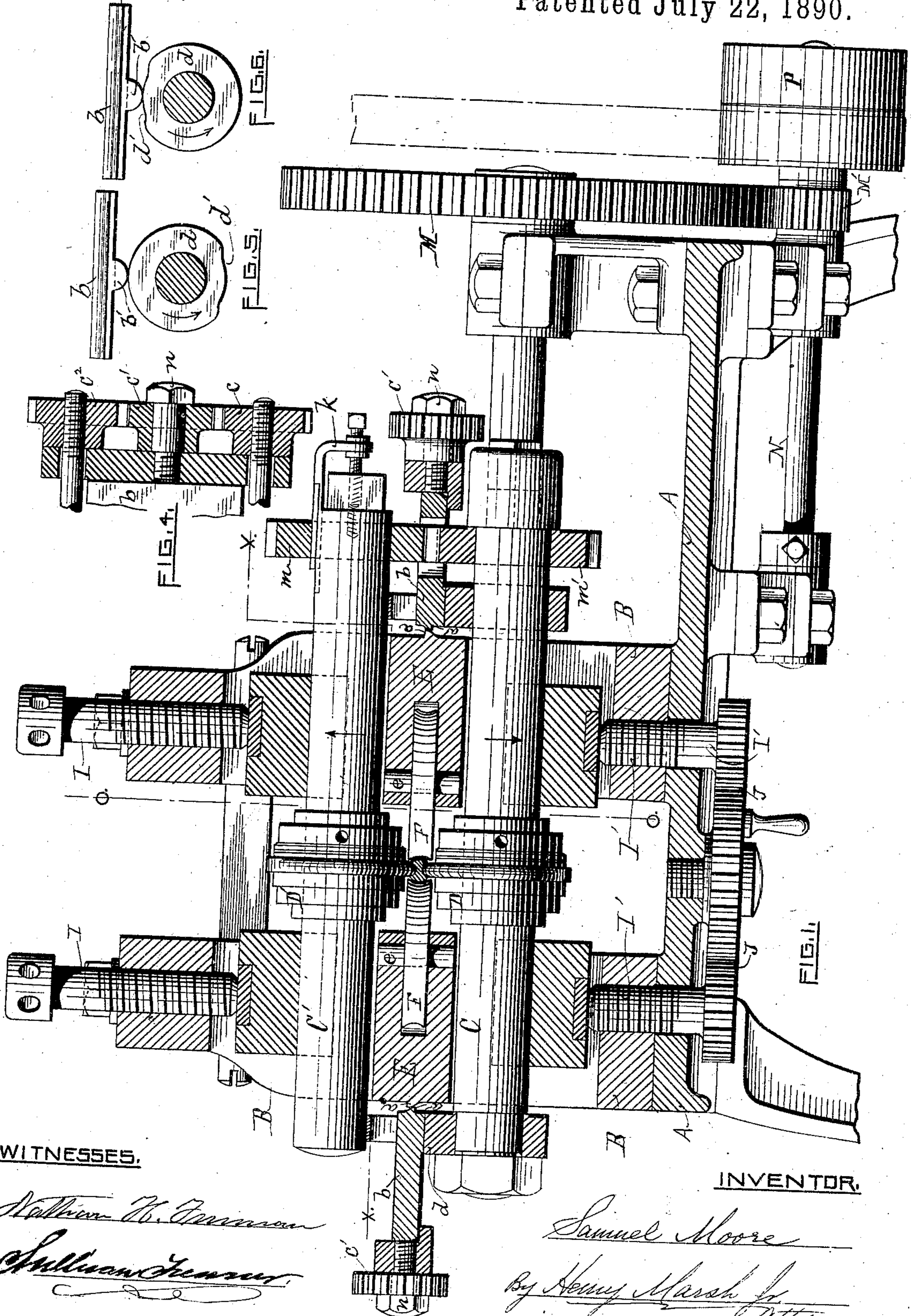
2 Sheets—Sheet 1.

S. MOORE.

MACHINE FOR MAKING TWIST DRILLS.

No. 432,635.

Patented July 22, 1890.



WITNESSES.

Nathan H. Johnson
Sullivan Johnson

INVENTOR.

Samuel Moore
By Henry Marsh Jr. Atty

(No Model.)

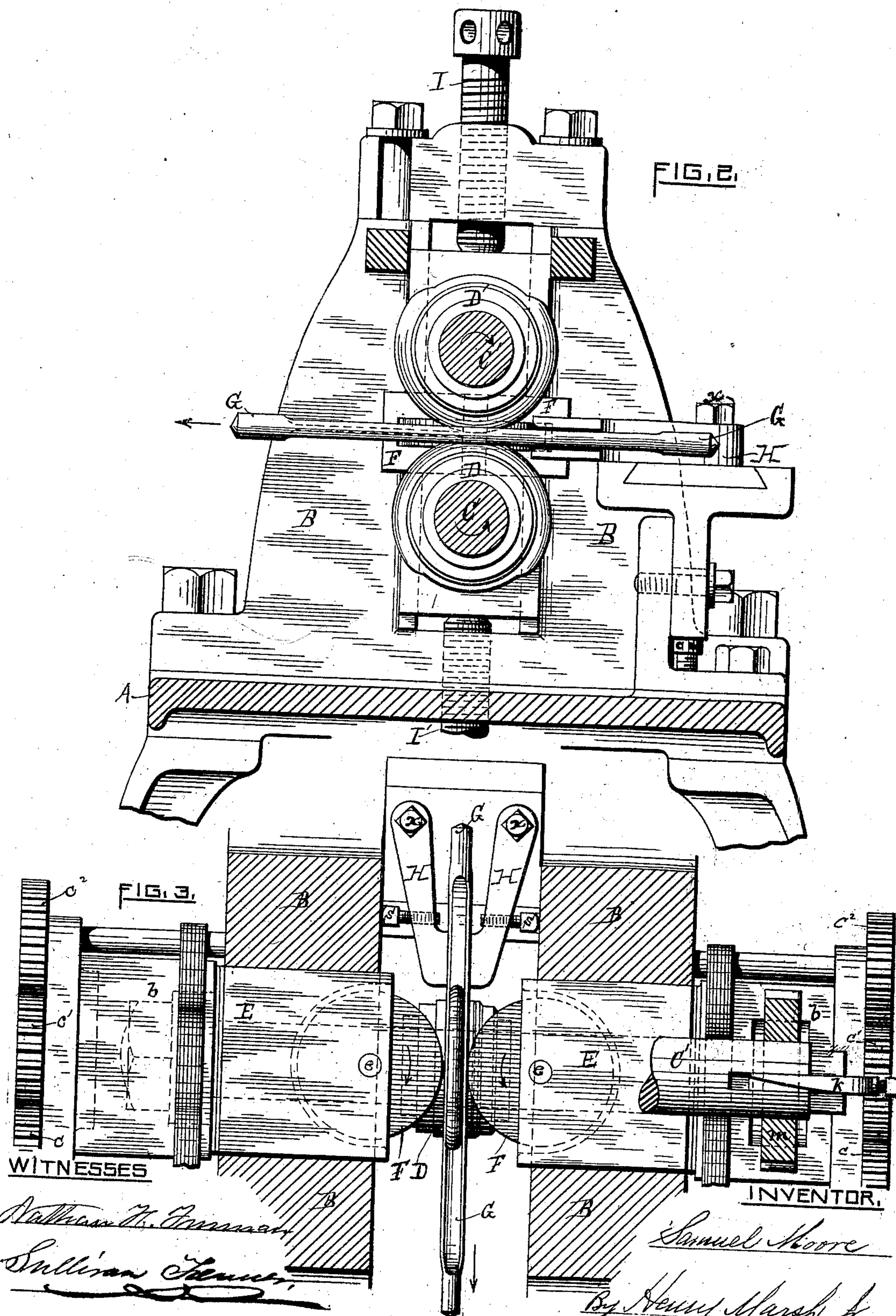
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MACHINE FOR MAKING TWIST DRILLS.

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UNITED STATES PATENT OFFICE.

SAMUEL MOORE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED STATES TWIST DRILL COMPANY, OF SAME PLACE.

MACHINE FOR MAKING TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 432,635, dated July 22, 1890.

Application filed May 21, 1886. Serial No. 202,836. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL MOORE, a citizen of the United States, residing in the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Machines for Making Twist-Drills, of which the following is a specification.

My invention relates to a machine for grooving and shaping drill-blanks, or as it is called, "rolling the blanks preparatory to twisting them;" and it consists in the arrangement and combination of rotary dies and horizontal rolls, and in the means provided for adjusting and automatically moving the horizontal rolls laterally to engage and release the drill-blank.

The purpose of my invention is to provide means for grooving and rolling drill-blanks uniformly and without injury to the metal and to perfect the side faces and grooved faces of the blank at the same operation of the machine.

In the accompanying drawings, Figure 1 is a longitudinal central section of the material portion of the machine. Fig. 2 is a central cross-section on line *o o* of Fig. 1, showing the vertical dies with engaged blank. Fig. 3 is a plan section on the irregular line *x x* of Fig. 1. Fig. 4 is an end view of the train of gears for adjusting the horizontal rolls. Figs. 5 and 6 are details of the adjusting plate and collar.

Similar letters denote like parts where they occur in the drawings.

A A represent a table common to lathes and analogous machines.

B B is a housing secured upon the table and having journaled in it the shafts C C', placed one above the other, with their axes in the same vertical plane, and carrying the rotary dies or rolls D D'. The faces of the rolls or dies D D' may be flat or convex. The flat-faced dies are used to first flatten the blank. Then the convex-faced rolls are used to roll in the groove. The die-face is cut away for a short distance, as shown in Fig. 2. The raised portion of the face is of sufficient length to roll the flattened or grooved portion of the blank, and as the dies roll along the blank

the cut-away portion affords room for the shank of the blank to clear itself, and for the entrance of the shank of a new blank to be made between the two dies.

In the housing B B are chambers in which I place the boxes E E, in which are pinned horizontal rolls F F, which have faces slightly concaved to give form to the sides of the drill-blank. These rolls turn freely on their pins *e e*, by friction only, against the sides of the blank, or in some cases against the side faces of the upper and lower dies. The axes of the horizontal rolls are at right angles to the axes of the dies, as shown in Fig. 1. The boxes E E have a beveled rib *a a* on their outer edges, which meets oppositely-beveled ribs *a' a'* on the inner faces of the adjusting-plates *b b*, which are held in place against the boxes with their rib *a'* resting against the rib *a* of the boxes E by a train of gears *c c' c''*, attached to the sides of the housing B B, as shown in Fig. 1. The central gear *c'* is held by a check-nut *n*. When the dies and horizontal rolls each have flat faces, the rolls are held firmly after adjustment by the plate *b* and the train of gears *c c' c''*. It is necessary, however, that in rolling drill-blanks means should be provided whereby the horizontal rolls may free themselves to clear the drill-blank shank from the rolls. To accomplish this automatically, I fit upon the shaft C, exterior to the housing cam, rolls or rollers *d d*, and form on the under side of the plates *b b* pendent lugs *b' b'*, adapted to ride on the faces of the rolls *d d* and to drop at suitable times into the depression *d'* in the faces of the rolls, thereby freeing the plate-ribs *a' a'* from contact with the ribs *a a* and allowing the plate to drop and the rolls F F to separate. As the rolls *d d* revolve with the shaft C the lugs *b' b'* will ride up onto the raised portion of the face of the rolls *d d* and crowd the ribs *a a a' a'* together and bring the faces of the rolls F F into position to again press against the sides of the blank G. Again, it is necessary in grooving and flattening the drill-blank that the upper and lower dies act at the same instant upon the blank, in order to secure the requisite uniformity in the grooves on both faces of

the blank. The upper and lower shafts C and C' are united and operated by a train of gears, and it is essential that they mesh properly to move in perfect unison. To this end I provide a wedge or beveled spline *k*, by which the gear *m* upon the upper shaft C' is nicely adjusted to mesh with the gear *m'* upon the lower shaft C at the proper point to cause the two dies D and D' to revolve in unison and grip the blank at the same instant, so that the grooves in the faces of the blank G will be of uniform length and depth throughout.

In rolling and grooving a double blank G it is desirable that it be rolled somewhat thinner in the middle of its length than at the ends of the groove next the shanks. It is also very desirable that the dies engage and clear the blank readily. I therefore remove a portion of the periphery of the die on one side and slightly thicken or enlarge it on the opposite side and allow the periphery to taper slightly from the center of the enlarged side back to the shallow side. This construction of the dies enables me to roll a double blank, in which the grooves enter and leave the blank on a taper and are slightly deeper in the middle of their length, as shown in Fig. 2.

The blank G is steadied by tunneled guides H H, adjusted by set-bolts *s s*, impinging against the housing B B, and pivoted at *x x*, as shown in Fig. 3. The upper and lower dies and their shafts C C' are adjustable in the housing by the ordinary means I I I' I' and train of gears J J.

In the event that it should be desirable at any time to hold the horizontal rolls F F steady and not allow them to free themselves, as hereinbefore described, I would substitute for the cam-rolls *d d* ordinary-faced rolls, thereby preventing the plates *b b* from dropping to free the rolls F F.

Modifications in the form and proportions of the rolls and dies may be made without departing from the principle of my invention.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of the rolls F F, boxes E E, provided with the beveled rib *a*, plate *b*, provided with the beveled rib *a'*, and train of gears *c c' c''*, all arranged for joint operation, as specified, and adapted to operate in conjunction with rotary dies D D' of a machine for rolling and grooving blanks for twist-drills.

2. In a machine for rolling and grooving blanks for twist-drills and analogous articles, the horizontal rolls F F, boxes E E, provided with the beveled rib *a*, the plate *b*, provided with pendent lug *b'*, cam-rolls *d d*, train of gears *c c' c''*, and shaft C, combined with each other and arranged for joint operation, as specified, whereby the drills F F are automatically caused to approach and recede horizontally to engage and free the blank.

3. The combination of the shaft C', gear *m*, and beveled wedge *k*, arranged for joint operation, as specified.

4. The within-described adjustable guides for a blank, consisting of the arms H H, pivoted at *x x*, in combination with the tap-bolts *s s*, arranged to impinge against the housing B B, as shown, and adapted to serve as specified.

5. The die D, consisting, as specified, of a roll or collar having a peripheral rim or flange extending only partly around it, said rim or flange being thickest in the middle of its length and tapering slightly from that point back along each side of the roll toward the points of the rise and fall of said flange into the face of the roll, whereby a drill-blank is rolled or grooved thinnest in the middle and with the grooved or flattened side entering and leaving the body of the drill on a taper, as shown and described.

In testimony whereof I have hereunto set my hand, in presence of two witnesses, this 18th day of May, 1886.

SAMUEL MOORE.

Witnesses:

HENRY MARSH, Jr.,
NATHAN H. FRUMAN.