

(No Model.)

2 Sheets—Sheet 1.

J. H. KANE.

APPARATUS FOR MAKING DRILLS.

No. 380,577.

Patented Apr. 3, 1888.

Fig. 1.

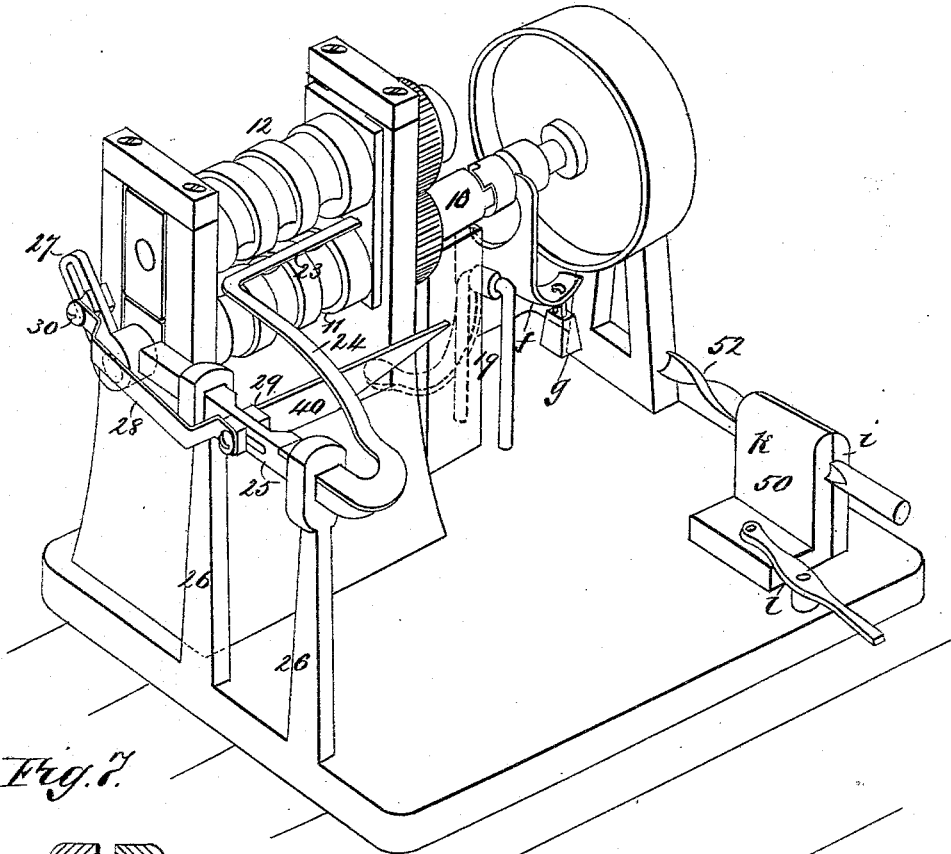


Fig. 2.

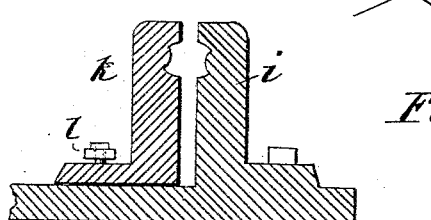
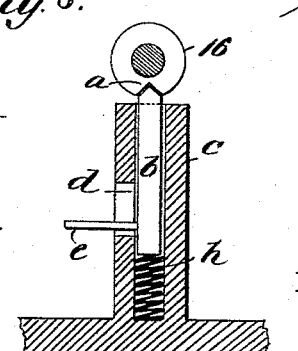


Fig. 3.



WITNESSES:
Francis M. Cordle.
C. Sedgwick.

INVENTOR:
J. H. Kane
 BY *Munn & Co.*
 ATTORNEYS.

J. H. KANE.

APPARATUS FOR MAKING DRILLS.

No. 380,577.

Patented Apr. 3, 1888.

Fig. 2.

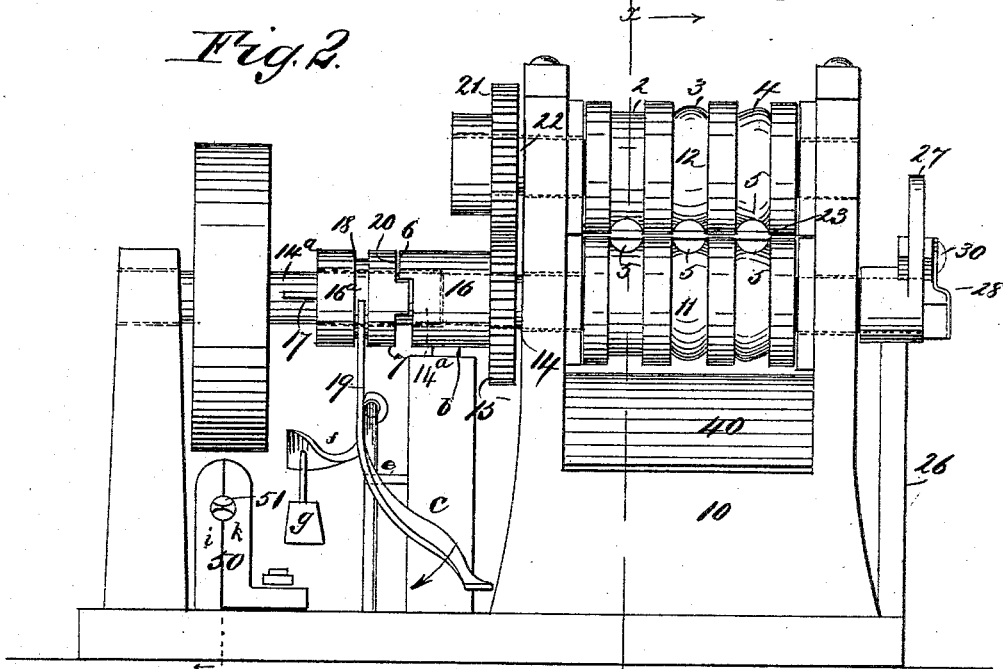


Fig. 4.

Fig. 5.

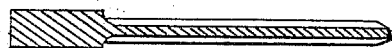


Fig. 3.

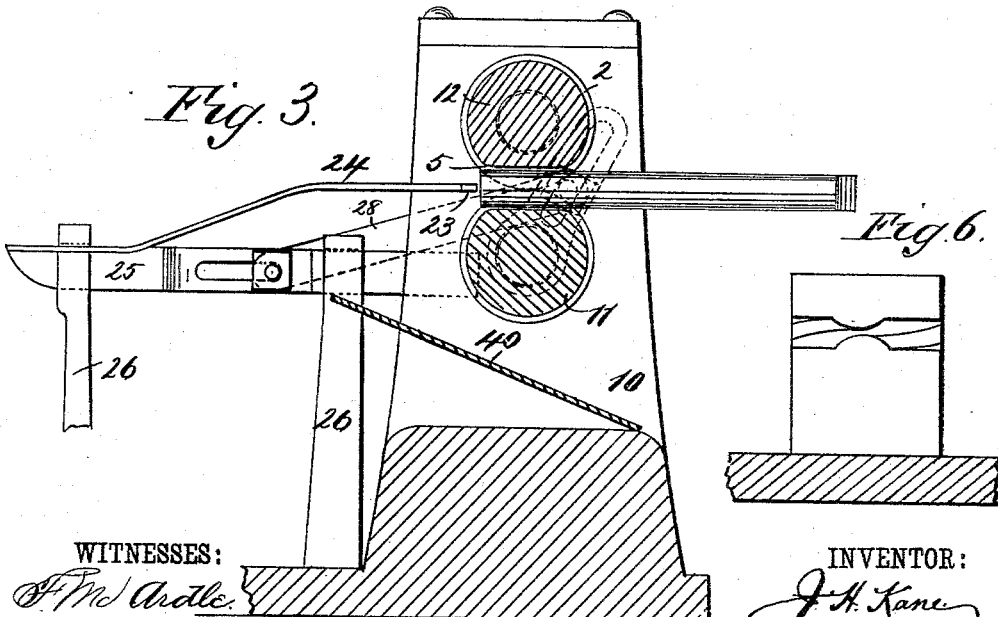
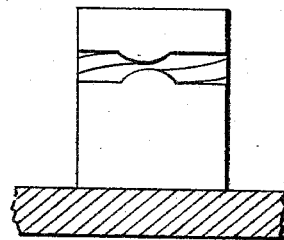


Fig. 6.



WITNESSES:

F. M. Ardle
C. Sedgwick

INVENTOR:

J. H. Kane
 BY *Munn & Co*
 ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN H. KANE, OF HUNTINGTON, WEST VIRGINIA.

APPARATUS FOR MAKING DRILLS.

SPECIFICATION forming part of Letters Patent No. 380,577, dated April 3, 1888.

Application filed May 27, 1887. Serial No. 239,539. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. KANE, of Huntington, in the county of Cabell and State of West Virginia, have invented a new and Improved Apparatus for Making Drills, of which the following is a full, clear, and exact description.

This invention relates to a novel form of machine that is applicable for use in the making of straight and spiral ground drills, the object of the invention being to provide for the cheap manufacture of drills of uniform and standard size; and to the end named the invention consists of a pair of grooved rolls, a roll-advancing mechanism, a gage arranged in connection with the rolls, and a gage-operating mechanism, all as will be hereinafter more fully described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of my improved drill-making machine. Fig. 2 is a front elevation of the machine. Fig. 3 is a cross-sectional elevation taken on line *x x* of Fig. 2. Fig. 4 is a view of one of the drill-blanks, representing the same as it appears after it has been rolled to the required form. Fig. 5 is a sectional view of the blank shown in Fig. 4, the view being taken on line *y y* of said figure. Fig. 6 is a face view of one of the drill-blocks or twister-sections. Fig. 7 is a cross-sectional view of the drill-block or twister, and Fig. 8 is a central vertical sectional view of the automatic stopping attachment.

In the drawings, 10 represents a heavy framework, in which there are mounted two rolls, 11 and 12, said rolls being formed with as many graduated grooves, as 2, 3, and 4, as are necessary to operate properly, the grooves of each roller being formed with a cut-away portion, 5, which portions are arranged so that they may be thrown into register, as is shown in Figs. 2 and 3.

The shaft 14 of the roller 11 carries a fixed gear, 15, said gear being upon an outwardly-extending sleeve, 16, which serves as a bearing for a shaft, 14^a, the axis of said shaft being in a line parallel with that of the axis of the

shaft 14. This sleeve 16 is integral with one section, 6, of a clutch, 20, the other section, 7, of said clutch being formed upon a sleeve, 16^a, that is carried by the shaft 14^a, and arranged to revolve therewith, the sleeve riding upon a feather, 17, that is carried by the shaft.

The sleeve 16^a has a groove, 18, in its peripheral face, and this groove 18 is entered by the bifurcated end of a treadle-lever, 19, the arrangement being such that when the treadle end of the lever is pushed in the direction of the arrow shown in connection therewith in Fig. 2 the two clutch-sections will be brought into engagement and a rotary motion will be imparted to the gear 15, and consequently to its shaft and to the roller 11 mounted thereon. The gear 15 engages with a gear, 21, that is mounted upon the shaft 22 of the roller 12, and as the gear 15 is revolved it will impart a rotary motion to the gear 21 and to the roller 12, controlled thereby, the two rollers being moved in unison, so that the cut-away portions 5 of the grooves 2, 3, and 4 will be brought into register at each revolution of the rollers.

In order that the rolls 11 and 12 may be automatically stopped at the end of each revolution, I form the sleeve 16 with a groove, *a*, that is entered by a spring-pressed stop, *b*, mounted in a standard, *c*, which is secured to the bed-plate beneath the sleeve 16, the standard being formed with a slot, *d*, through which there extends an arm, *e*, which is rigidly connected to the stop *b*, the arm being arranged so that it will be borne upon by the treadle 19 and depressed as the treadle is moved to throw the two clutch-sections 6 and 7 into engagement.

The treadle-lever 19 is provided with an arm, *f*, to which there is attached a weight, *g*, the arrangement being such that immediately after the pressure upon the treadle 19 is relaxed the weight *g* will act to throw the two clutch-sections out of engagement, and then the stop *b* will be free to rise into engagement with the groove *a* of the sleeve 16, the slot being preferably arranged above a spiral spring, *h*, as shown in Fig. 8.

In advance of the rollers 11 and 12 I mount a gage-bar, 23; that is carried by an arm, 24, said arm being in turn connected to a slide, 25, that is supported by two posts or standards, 26.

A pitman, 28, serves to connect the slide 25 to a crank-arm, 27, that is carried by the shaft 14, the pitman being adjustably connected to the slide 25 by a block, 29, the wrist-pin 30, by which the pitman is connected to the crank, being also adjustable, the crank-arm and the slide being formed with longitudinal slots, as indicated. From this construction it will be seen that the gage may be set at any required distance from the rolls, and that as the rolls are advanced the gage will be carried away from the rolls during the first half-revolution thereof, to be returned to the position shown in the drawings during the last half-revolution of the rolls.

In operation the blanks from which the drills are to be formed are heated and are taken by the operator and passed through the space between the rolls 11 and 12 formed by the cut-away portions of the grooves at times when said cut-away portions are brought into register, the heated blank being shoved inward until its end strikes against the gage 23. As soon as the end of the blank strikes the gage the operator depresses the treadle-lever 19 and throws the clutch-sections 6 and 7 into connection, thus advancing the rollers 11 and 12, the gage being carried outward at the same time to allow for the forward movement of the blank. After the blank has passed between the rollers it falls upon an inclined chute, 40, and slides toward the operator, who again grasps it with proper tongs and passes it through another set of grooves, the gage 23 having been returned and the rolls having been automatically stopped the moment the cut-away portions 5 come into register. The idea of forming these cut-away portions 5 and of providing the gage 23 is to provide for the passage of the drill-shank and to cause the ribs of the grooves 2, 3, and 4 to strike against the drill-blank at the same place at each revolution of the rollers. After the drill-blank has been rolled, as above described, it will assume about the form illustrated in Figs. 4 and 5—that is, there will be formed in the peripheral face of the blank two concave parallel grooves which extend from one end of the blank to that portion which is to constitute the shank of the blank.

Drills of this form might be used as straight drills; but in order that a spiral twist may be imparted to the drills I employ a sectional twist-block, 50, of which the section *i* is rigidly connected to any proper base—as, for instance, the base of the machine—while the section *k* is mounted to slide upon the base, being moved forward and back by a lever, *l*. When the faces of the two sections are brought together, there will be an aperture between the faces, said aperture being circular in cross-section except for a pair of convex-faced ribs, which extend spirally about the aperture, so that in reality the cross-section of the aperture corresponds with that of the drill-blank.

After the blanks illustrated in Figs. 4 and 5 have been formed they are seized by any

proper implement and placed between the sections *i* and *k*, the section *k* being forced up toward the section *i*, and the drill-blank is then forced forward and backward through the aperture 51, and as the blanks are so forced forward and backward a spiral form will be imparted to their grooves, as illustrated at 52 in Fig. 1. To finish the drills the shanks are turned up upon a lathe to fit the press socket, after which the drills are hardened, the clearance being rolled in the back and the edges being trued up along the grooves by means of an emery-wheel that is attached to the slide-rest of a lathe, the drill being revolved slowly, while the wheel is revolved at a high rate of speed—say two thousand a minute—and as the wheel is started at the shank and moved toward the point of the drill it will be somewhat worn when it reaches said point, and consequently will grind so as to produce the necessary taper for the clearance of the drill, and the drills being finally pointed or ground, they will be ready for use.

A saving of at least thirty per cent. of material is gained by the above-described process of producing drills, as the material is drawn out instead of being cut away by a lathe and milling-tools; and, outside of the question of material, long drills can be manufactured about as cheaply as short drills, and the spirally-twisted drills, which are in great demand and would be more extensively used except for their very high cost, are produced at an exceedingly low rate.

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

1. In a drill-making machine, the combination, with grooved rolls, of a reciprocating gage held in front of the rolls and operated from the shaft of one of the said rolls, substantially as herein shown and described.

2. In a drill-making machine, the combination, with a pair of rolls provided with grooves having cut-away portions, of a gage held in front of the rolls and a connection between the gage and the shaft of one of the said rolls for reciprocating the same, substantially as herein shown and described.

3. In a drill-making machine, the combination, with grooved rolls, the shaft of one of the rolls being provided with a crank-arm, of a gage held in front of the rolls, a slide to which the gage is attached, and a pitman connected to the said crank-arm and slide, substantially as herein shown and described.

4. In a drill-making machine, the combination, with a pair of grooved rolls formed with cut-away portions, and intermeshing gears carried by the shafts of the said rolls, of a clutch-section carried by one of the said gears, a second clutch-section carried by the driving-section, a lever for throwing the clutch-sections in and out of gear, and a stopping device operated by the clutch-operating lever, substantially as herein shown and described.

5. In a machine for making drills, the com-

5 bination, with a pair of rolls formed with graduated grooves having cut-away portions 5, of intermeshing gears carried by the rolls, one of said gears being made integral with a sleeve which constitutes the bearing for one end of the power-shaft, a clutch-section formed upon said sleeve, a sleeve mounted upon a feather carried by the main power-shaft and formed with a second clutch-section, a means 10 for throwing the two clutch-sections into engagement, and a means for automatically releasing the said sections, a gage, a slide to which said gage is connected, and a pitman connected to the slide and to a crank-arm that 15 is carried by one of the roller-shafts, substantially as described.

6. In a drill-making machine, the combination, with a pair of grooved rolls and inter-

meshing gears on the shafts of the said rolls, of a grooved sleeve attached to one of the gears 20 and a spring-pressed stop for engaging the groove of the said sleeve, substantially as herein shown and described.

7. In a drill-making machine, the combination, with a pair of grooved rolls, intermesh- 25 ing gears on the shafts of the rolls, a clutch, one section of which is provided with a groove, and clutch-operating lever, of a spring-pressed stop for engaging the groove, provided with an arm engaged by the clutch-operating lever, 30 substantially as herein shown and described.

JOHN H. KANE.

Witnesses:

THOS. W. TAYLOR,
D. L. KANE.