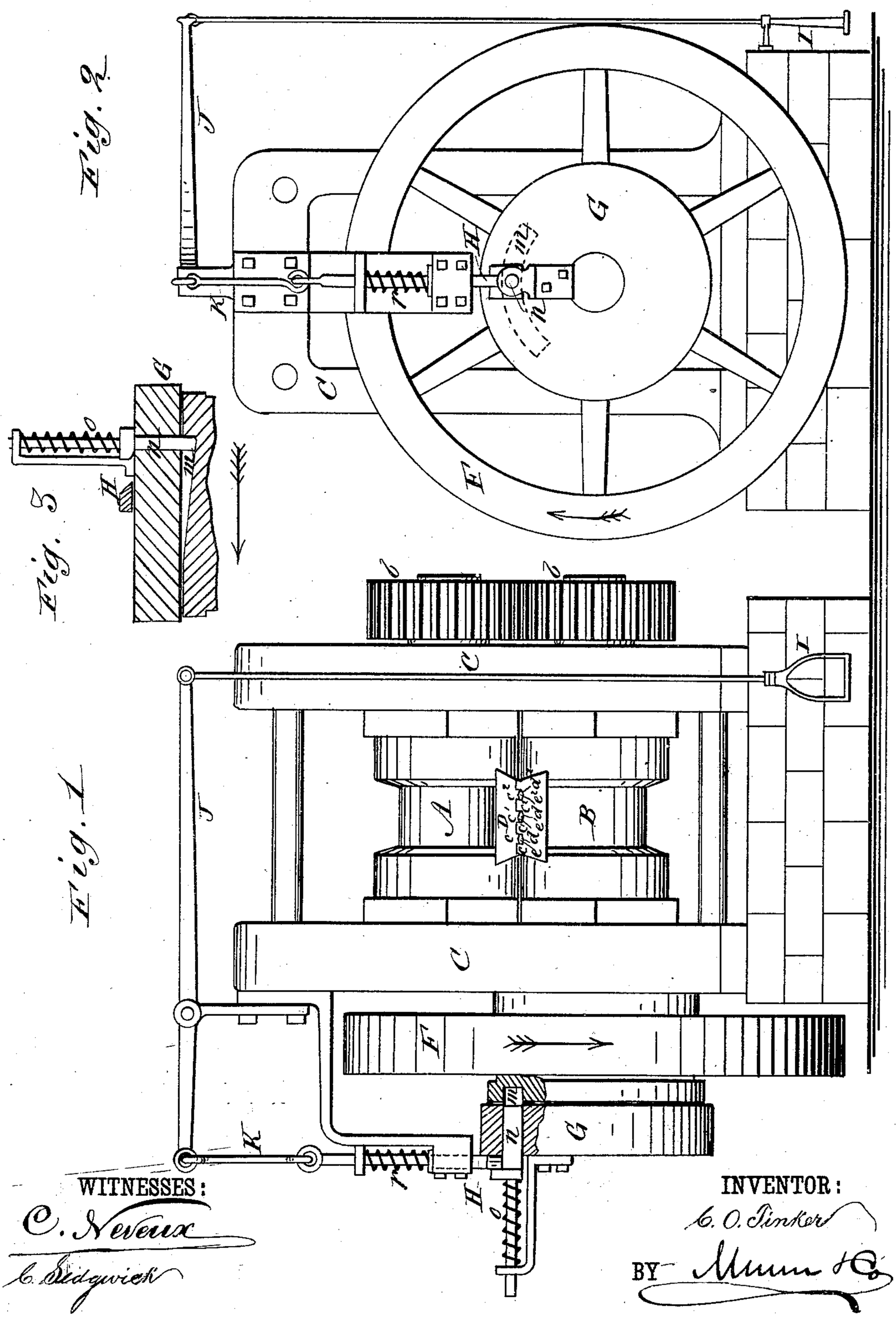
(No Model.) 2 Sheets—Sheet 1.

C. O. TINKER.

MACHINE FOR MAKING AUGER BLANKS.

No. 280,098. Patented June 26, 1883.



WITNESSES:

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INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

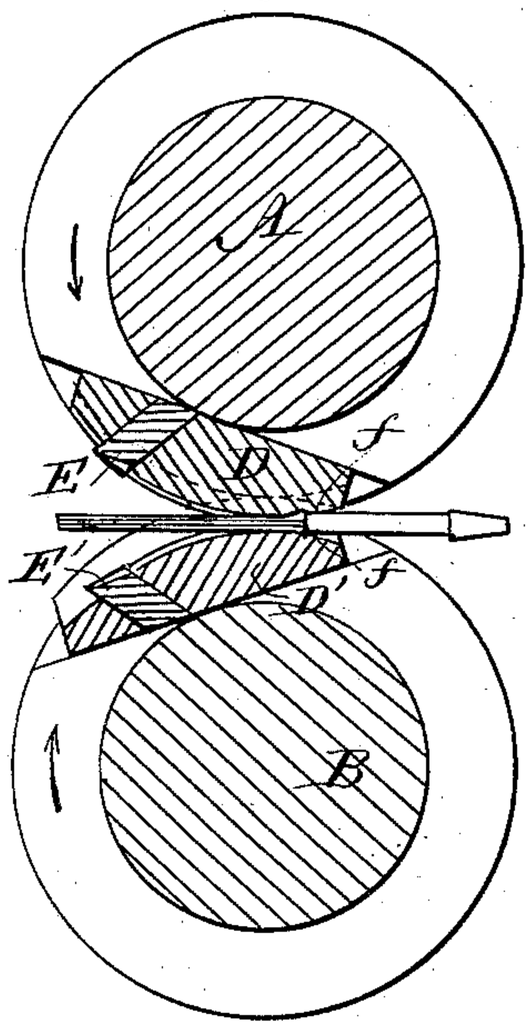

Fig. 5

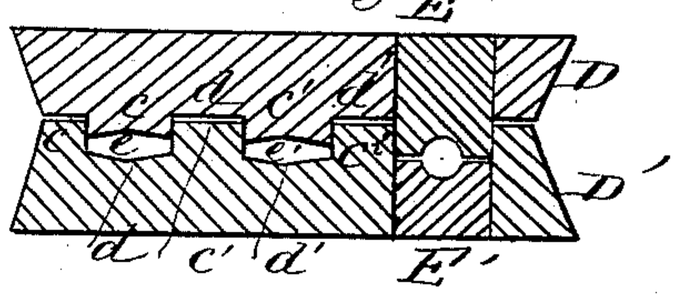

Fig. 6

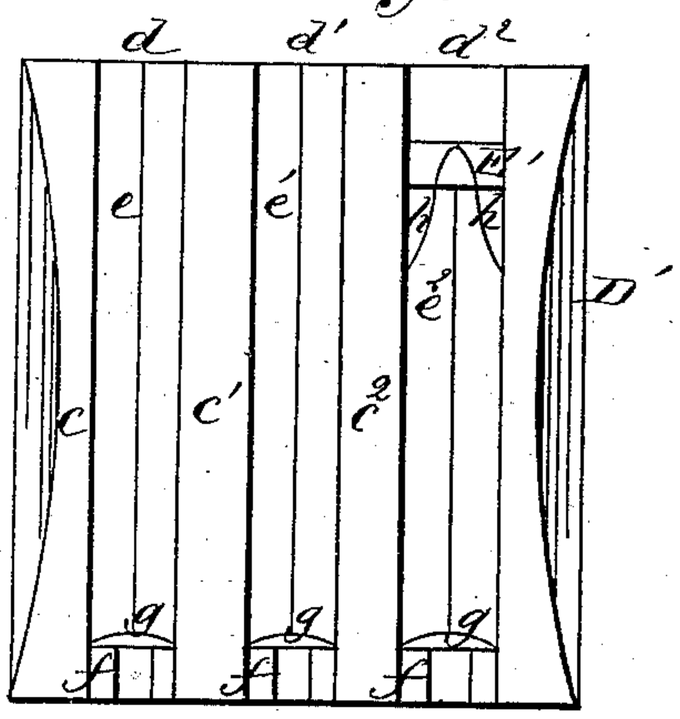

Fig. 7

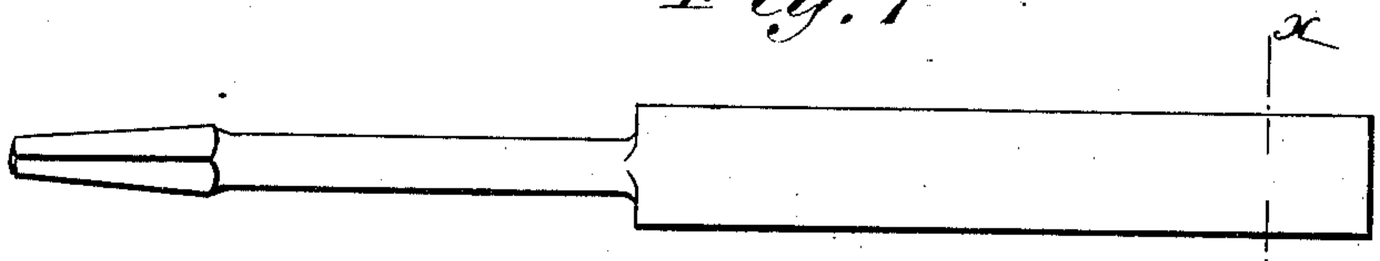

Fig. 8

Fig. 9

Fig. 10

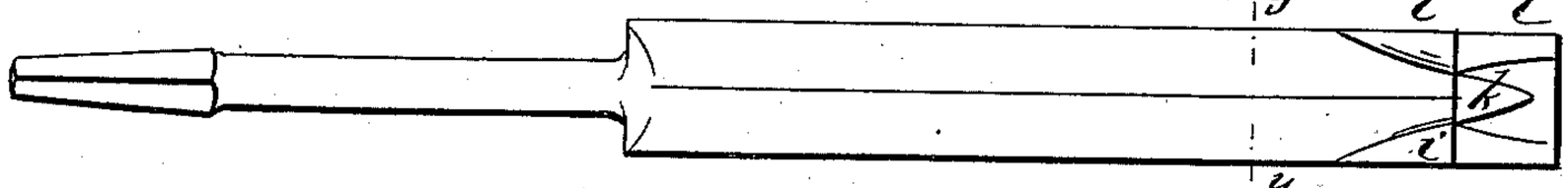

Fig. 12

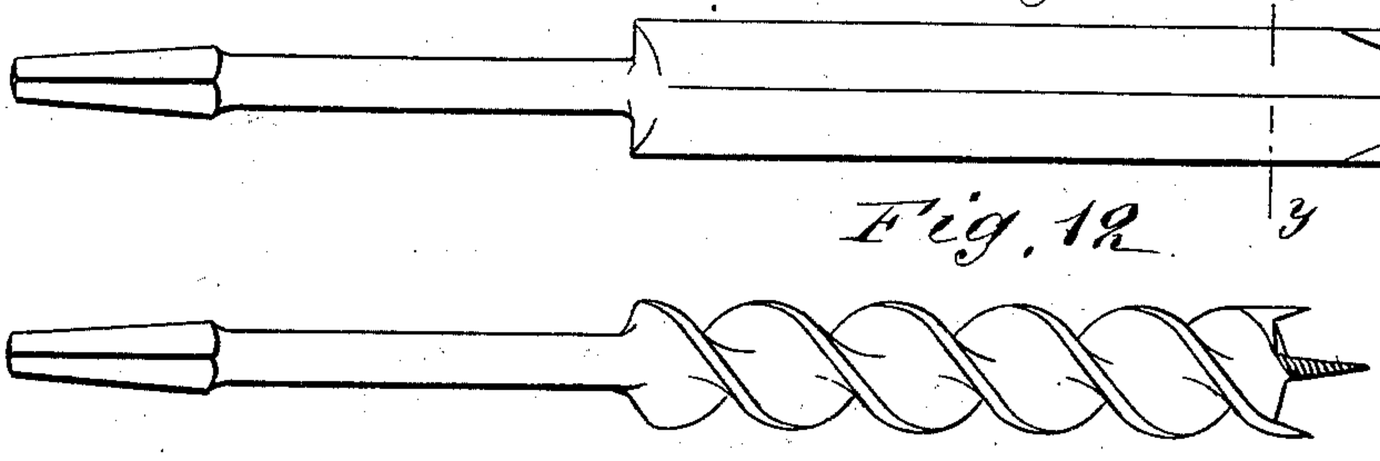

Fig. 11

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UNITED STATES PATENT OFFICE.

CHARLES O. TINKER, OF ASHTABULA, OHIO.

MACHINE FOR MAKING AUGER-BLANKS.

SPECIFICATION forming part of Letters Patent No. 280,098, dated June 26, 1883.

Application filed July 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES O. TINKER, of Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Machines for Making Auger-Blanks, of which the following is a full, clear, and exact description.

This invention relates to the rolling of auger-blanks, in place of producing them by hammering; and it consists in a certain construction of main dies applied to the rolls, and subsidiary or secondary dies inserted in and made removable from the main dies; also, in special driving and clutch mechanism for operating the rolls and timing the dies to the work, whereby I am enabled to fashion the rough blanks into finished ones with uniformity and dispatch, ready for their ultimate conversion into augers; also, the metal is so distributed that no additions to the blanks, by welding or otherwise, are necessary, and other advantages are obtained, substantially as hereinafter described.

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

Figure 1 represents a side elevation of a machine for making auger-blanks embodying my invention, with a portion of the clutch mechanism in section. Fig. 2 is an end elevation of the same. Fig. 3 is a horizontal section of the clutch mechanism in part. Fig. 4 is a transverse section, upon a larger scale, of the upper and lower rolls of the machine, with dies attached, and showing an auger-blank in the course of being operated on. Fig. 5 is a transverse section of the two main dies, and Fig. 6 a face view of one of them. Fig. 7 is a longitudinal face view of one of the auger-blanks as or before it is introduced to the machine, and Fig. 8 a transverse section of the same on the line *x x* in Fig. 7. Fig. 9 is a longitudinal face view of the blank after it has been broken down and partly formed in the machine. Fig. 10 is a longitudinal face view of the blank after it has been finished in the machine, and Fig. 11 is a transverse section thereof on the line *y y* in Fig. 10. Fig. 12 is a longitudinal view of a finished auger as made from a blank produced in my machine.

A B in the drawings indicate upper and lower flanged rolls mounted in a suitable frame, C, and geared by pinions *b b* to work in unison. Power to drive said rolls may be communicated to either one; but it is here shown applied to the lower one, as hereinafter described. Applied to these rolls A B, between their flanges—as, for instance, by a sliding dovetail lock or fit—are two segmental or other suitably-shaped main die-blocks, D D′, of concentric curvature, with rolls on their outside faces, and pitched or arranged so that they work in rolling contact with each other. These dies are constructed with parallel tongues and grooves *c c′ c²* and *d d′ d²* on their convex faces, in direction of the length of their arcs, the tongues of either of said die-blocks D D′ being made to correspond with the opposite grooves in the other, so that they will exactly fit or enter within each other to prevent the escape of metal in the blank between or at the sides of the grooves, and so that the tongues *c c′ c²* on the die of the one—say the upper—roll will, in their engagement with the grooves *d d′ d²* in the die of the other or lower roll, form a succession of passes or spaces, *e e′ e²*, for the auger-blank under operation. The walls of these spaces, as formed by the convex bottoms of the said grooves *d d′ d²* in the one main die-block, D′, and convex exteriors of the tongues *c c′ c²* on the other main die-block, D, are specially shaped to provide for the auger-blank as it is successively passed through the spaces *e e′ e²*. The number of these spaces or passes in the dies of the rolls may be changed, if desired; but for all practical purposes, and to produce the finished blank shown in Figs. 10 and 11, or as it issues from the dies, as shown in Fig. 9, from the rough or plain blank shown in Figs. 7 and 8, ready for converting, by twisting and otherwise, into the complete auger or auger-bit shown in Fig. 12, three of such passes *e e′ e²* will suffice, the first two of which are for breaking down the plain blank to prepare it for the final pass, *e²*. The convex surfaces of the tongues *c c′ c²* in the die-block D, and the bottoms of the grooves *d d′ d²* in the die-block D′, are mainly formed alike—that is to say, they are made reversely beveling from opposite sides, so as to make the passes *e e′ e²* deepest in their centers, as

shown in Figs. 1 and 5, and with grooved protuberances *f* at one end to provide for reception of the auger-shank, and with depressions *g* inside of the inner end of the protuberances *f*. This gives a reverse or double-wedge form to the plain blank or its opposite sides or faces, with the greatest thickness in its center longitudinally, and with the necessary increase of metal near the shank, as shown in Figs. 9 and 10. The convex surface of the tongue c^2 of the main die-block D, and bottom of the groove d^2 in the die-block D′, forming the final pass e^2, are, however, further provided, near their rear ends, with other depressions, *h h*, (only seen in Fig. 6 as made in the die-block D′; but both dies are alike,) and intercepting point-forming and indenting secondary dies E E′. These depressions *h h* and secondary dies E E′ give the necessary swells *i i* to the outer end of the blank and form the point *k* for the screw of the auger; also, said secondary dies cut off or nearly sever, so that it may be afterward broken off, the waste metal *l* at the outer end of the finished blank. The construction of the main die-blocks D D′, as described, distributes the metal to different parts of the blank as required, especially to the part of the blank from which the head and cutting-edges of the auger are produced, and the combined dies serve to give the necessary finish to the blank without welding metal onto it to subsequently form the spurs, pointed screw, lips, and cutting-edges of the auger shown in Fig. 12. Of course augers of different sizes, and more or less of different shapes, will require corresponding changes in the construction of the dies and in the depth and shape of the depressions in them; but the same peculiarity of construction will prevail throughout. Here it may be observed that the first two passes, *e e′*, which are mainly for breaking down the blank, are narrower than the final pass, e^2, just as the finished blank shown in Figs. 9, 10, and 11 is wider than the plain blank shown in Figs. 7 and 8, which plain blank, when the main dies D D′ are by the turning of the rolls in receiving position, is passed first between the tongue *c* and groove *d* of the one pass, *e*, and successively between the tongue *c′* and groove *d′* and tongue c^2 and groove d^2 of the passes *e′* e^2. Each of these operations on the blank is separate and distinct from the other, and the blank requires to be properly heated for all of them.

The secondary or point-forming and indenting dies E E′ are inserted radially within or through the main dies D D′ at points so as to act upon the end portion of the body or broad part of the blank, and may rest at their inner ends against the bodies of the rolls. Said secondary dies are made slightly tapering outward, so that they can be readily raised and removed from the sliding and adjustable or removable main dies for resharpening when necessary.

As hereinbefore described, the blank is acted upon successively within the grooves *d d′* d^2 of the main die-block D′ as the two main die-blocks D D′ in or by the rotation of the rolls come into position to receive the blank. I have found from actual experiment that it is not practicable or convenient to run the rolls continuously sufficiently slow for the operator to so place the blank in its proper place in the dies. I consequently give the rolls an intermittent revolving motion and apply thereto a controllable automatic clutch or stop without interrupting the continuous action of the driver, and so that the rolls will be stopped, and by their friction remain stopped a sufficient length of time during each revolution for the reception of the blank in its successive changes or passes between the main dies. The means represented for this purpose are constructed substantially as follows: F in Figs. 1 and 2 is a driving pulley or wheel arranged loosely upon the shaft of, say, the lower roll, B. This wheel carries an outside face disk or portion constructed with a recess, *m*, in its outer face, having a sloping back that is preferably faced with steel to resist the shock of a clutch-pin, *n*, that engages with it. Fast upon said roll-shaft, outside of the pulley F, is another disk or wheel, G, through which the pin *n* slides, and is pressed inward by a spring, *o*, to engage with the recess *m* in the pulley F whenever a wedge, H, that is pressed downward by a spring, *r*, is raised for the purpose, said wedge or wedge-shaped bolt H being so arranged that when pressed down the head of the clutch-pin *n*, by striking on the inner surface of said wedge H during the rotation of the disk G, causes said pin to be withdrawn from engagement with the wheel F. A stirrup or treadle mechanism, I J K, serves to lift the wedge H when required. When an auger blank is to be inserted between the dies D D′, the rolls A B have their motion automatically arrested by the withdrawal from engagement with the continuously-revolving pulley F of the clutch-pin *n* by the head of said pin striking the depressed wedge H, which is so arranged that said rolls are stopped when their dies are in proper receiving position for the blank. After the insertion of the blank the operator presses down on the stirrup I and raises or releases the wedge H, which allows the clutch-pin *n* to enter the recess *m* in the pulley F, when said recess during the rotation of the pulley comes into engaging line or position with said pin. The operator having released his foot from the treadle I, the rolls are then rotated, in common with the pulley F, to secure the action of the dies on the blank; but after one revolution the clutch-pin *n* is again automatically withdrawn by the wedge H from its engaging position to provide for the insertion of the auger-blank in the next groove of the lower main die, when the operation is repeated as before. This action is repeated until the blank shown in Fig. 9 is produced by the operation of the tongue c^2, groove d^2, and secondary dies E E′ on the blank.

I am aware that rolls having tongues and grooves in their working-surfaces operating as dies to produce an article the counterpart of the recess between the tongue and the groove are old for various purposes, and that in some cases devices have been combined with said rolls for cutting the blanks into the required lengths and for tapering or pointing the ends so cut. Such, therefore, in the abstract, I do not claim, nor yet the clutch mechanism by itself or irrespective of its connection with the rolls and their dies; but,

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

1. In a machine for rolling auger-blanks, the combination, with the rolls A B, of the removable main die-blocks D D′, constructed with a series of parallel tongues and grooves for successive action on the auger-blank, as described, and jointly therewith the secondary removable pointing and cutting-off dies E E′, arranged to intersect said main dies, substantially as shown and described.

2. The tongued and grooved roller die-blocks D D′, provided with a series of parallel passes having upper and lower transversely-concave or reversely-beveled surfaces, and with grooved protuberances *f* and depressions *g* at or near their one end, essentially as and for the purposes herein set forth.

3. The tongued and grooved main die-blocks D D′, having their final pass, e^2, for the blank under operation constructed to give increased depth at its center longitudinally, and with grooved protuberances *f* and depressions *g* at or near its one end, and depressions *h h* near its opposite end, in combination with the pointing and cutting-off dies E E′, substantially as shown and described, and for the purposes specified.

4. The combination of a treadle or stirrup mechanism with the wedge H and its controlling-spring *r*, the sliding clutch-pin *n* and its spring *o*, the revolving disk or wheel G, through which said pin is fitted to slide, the loose revolving driving wheel or pulley F, constructed with an engaging-recess, *m*, for the pin *n*, and the geared rolls A B, and the many parallel tongued and grooved die-blocks D D′, fitted to or within sectional portions of said rolls, substantially as and for the purposes herein described.

CHARLES O. TINKER.

Witnesses:
CHAS. TINKER,
B. H. RICKARD.