

No. 663,122.

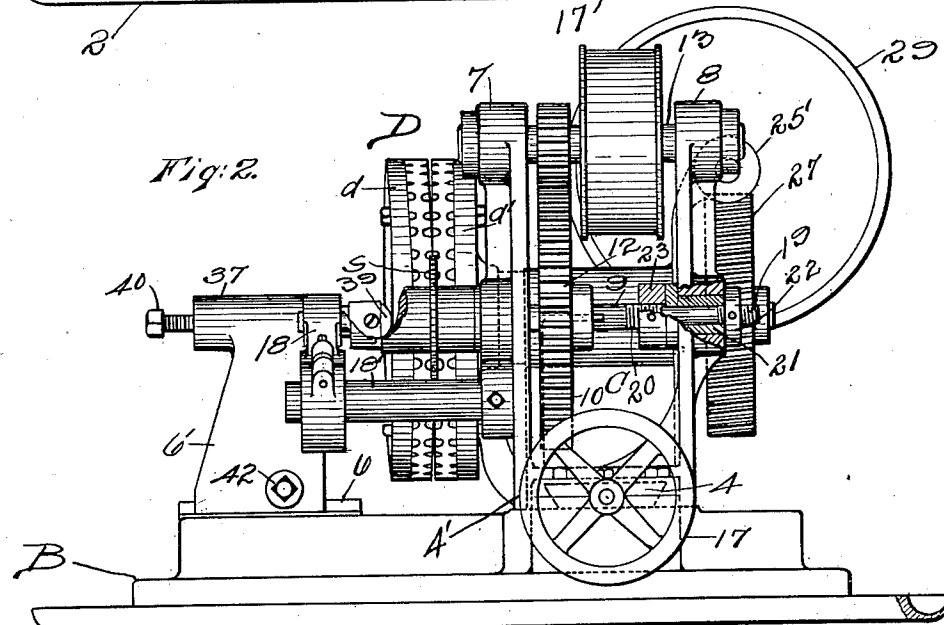
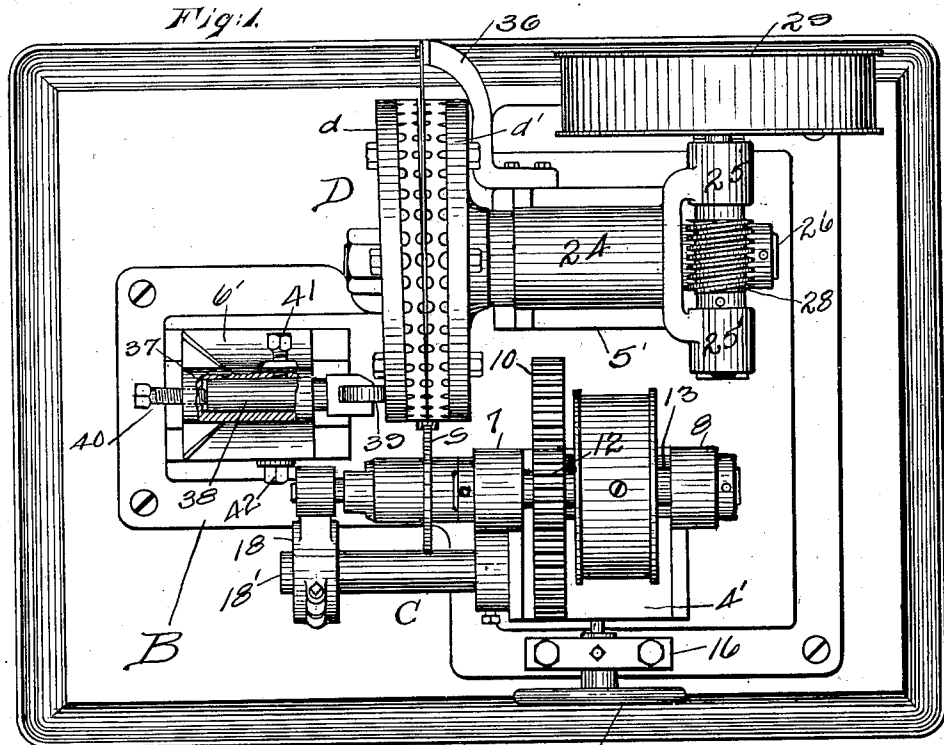
Patented Dec. 4, 1900.

R. HAKEWESSELL & E. C. HENN.
SLOTTING MACHINE.

(Application filed Apr. 24, 1900.)

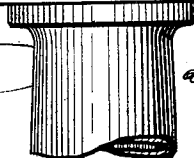
(No Model.)

2 Sheets—Sheet 1.



Witnesses
L. H. Blood.
L. C. Wood

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Inventors
Reinhold Hakewessel
and Edwin C. Henn,
by C. Whitney atty.

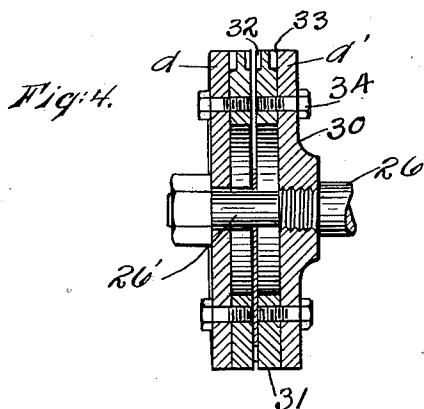
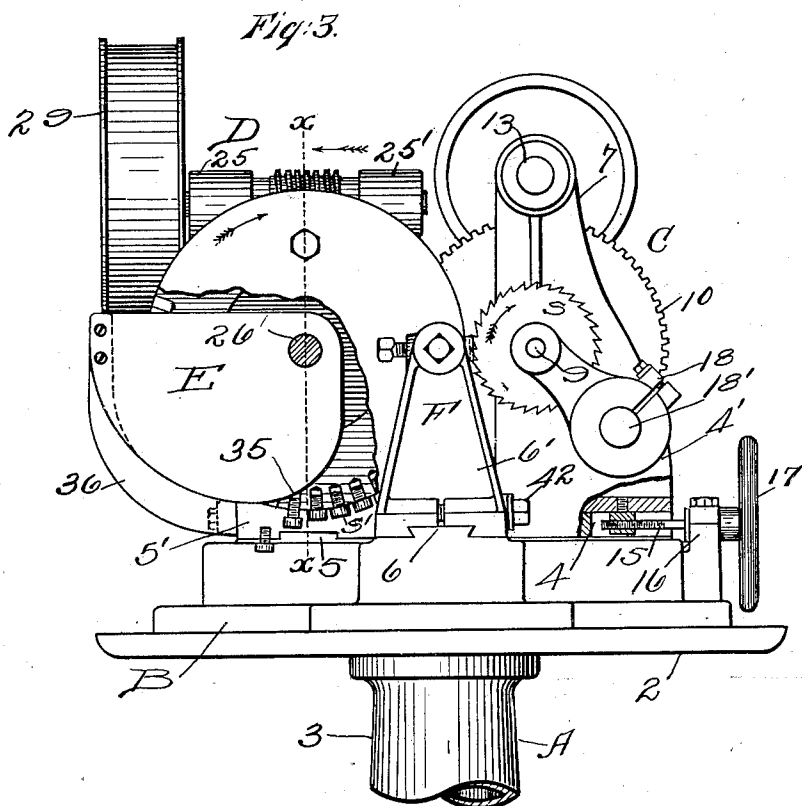
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2 Sheets—Sheet 2.



Witnesses

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Inventors

Reinhold Hakewessel
and Edwin C. Henn,
by L. Whitney Attorney.

UNITED STATES PATENT OFFICE.

REINHOLD HAKEWESSELL, OF HARTFORD, AND EDWIN C. HENN, OF
BLOOMFIELD, CONNECTICUT.

SLOTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 663,122, dated December 4, 1900.

Application filed April 24, 1900. Serial No. 14,185. (No model.)

To all whom it may concern:

Be it known that we, REINHOLD HAKEWESSELL, a resident of Hartford, and EDWIN C. HENN, a resident of Bloomfield, in the county of Hartford and State of Connecticut, citizens of the United States of America, have invented certain new and useful Improvements in Slotting-Machines, of which the following is a specification.

10 This invention relates to slotting-machines of that class adapted for cutting the niches or slots in the heads of screw-blanks and will be hereinafter referred to as a "screw-blank-slotting machine."

15 One object of the present invention is to produce an improved, simplified, and efficient "semi-automatic" screw-blank-slotting machine embodying rotating blank carrying and presenting means, including two obliquely-
20 disposed separated blank-grasping disks supported for rotation in a vertical plane and each having a multiplicity or series of circumferential radially-disposed blank-receiving recesses, and rotating slotting means em-
25 bodying a saw disposed in the plane of rotation of and adjustable toward and from the disks.

A further object of the invention is to provide a machine of the class specified embody-
30 ing rotative adjustable slotting means, coöperative screw-blank carrying and presenting means, including two approximately-concentric obliquely-disposed blank-grasping disks rotating substantially in the plane of the saw,
35 and independent means for rotating said disks and saw in the same direction and at relatively-different peripheral velocities.

With these objects in view the invention consists in certain details of construction and
40 in the combination and arrangement of the several parts of the machine, substantially as hereinafter described, and more particularly pointed out in the claims.

In the drawings accompanying and forming
45 part of this specification, Figure 1 is a plan view of a screw-blank-slotting machine embodying the present invention, a portion of one of the elements of the disk-closing device being broken away. Fig. 2 is a rear eleva-
50 tion of the machine, drawn in projection with Fig. 1, parts thereof being broken away. Fig.

3 is an end view of the machine as seen from the left in Fig. 1, a portion of one of the blank-grasping disks being broken away to show the position of the screw-ejector and a portion of
55 the slide of the saw mechanism being broken away to more clearly show the adjusting means in connection with said saw; and Fig. 4 is a cross-sectional view of the blank-grasping disks and a portion of the spindle, taken on
60 a line corresponding with the dotted line *xx* in Fig. 3, looking in the direction of the arrow in said figure.

Similar characters refer to like parts in all the figures of the drawings.

In the drawings only so much of the screw-blank-slotting machine is shown as will clearly illustrate the construction and mode of operation of the several coöperative instrumentalities, the lower portion of the framework or
70 base being omitted; but it will be understood that in practice the machine will be provided with a suitable base having a vertical column for supporting the bed-plate of the machine, said bed-plate and a portion of said column
75 being shown in Figs. 2 and 3 of the drawings, which column and bed-plate constitute a portion of the base or framework proper of the machine.

In the preferred construction and organiza-
80 tion thereof illustrated in the accompanying drawings the screw-blank-slotting machine comprises as a whole a suitable framework or base, (shown in part and designated by A;) a bed B, supported on said base and having
85 a plurality of horizontal slideways; rotative slotting means (designated in a general way by C) and including a slide adjustably supported on one of said slideways; rotative
90 screw-blank carrying and presenting means, (designated in a general way by D,) including blank-grasping disks *d* and *d'* and also including a slide mounted for adjustment on another slideway; a screw-ejector E in oper-
95 ative relation with the screw-blank carrying and presenting means and effective for ejecting the screws from said means after slotting, and disk-closing means, (designated in a general way by F,) including a slide mounted on
100 another slideway and also including a disk-closing member in bearing engagement with one of the grasping-disks and effective for

forcing each successive peripheral portion of one disk toward the corresponding portion of the other disk at a predetermined point in the rotative movements of said disks or when said portion arrives at a predetermined point with relation to the slotting means.

The base or framework A of the machine, which may be of any suitable or desired construction, preferably comprises a rectangular bed-plate 2, supported upon a pedestal or column 3 of suitable height, having a base plate or flange (not shown) at the lower end thereof.

The bed proper, B, of the machine is shown of somewhat T shape in the plan view and has three horizontal slideways 4, 5, and 6 on the upper face thereof, the ones 5 and 6 being disposed in substantial parallelism and at right angles to the longitudinal axis of the other slideway 4, and which slideways are adapted to receive the slides or carriers of the slotting means, the screw-blank carrying and presenting means, and the disk-closing means, respectively, as will hereinafter be fully described.

The rotative slotting means C in the preferred construction thereof illustrated in the accompanying drawings comprises a slide or carrier 4', mounted on the slideway 4 and preferably having two uprights 7 and 8 for supporting certain elements; a rotative saw or toothed disk 9, secured to a spindle 9, adjustably supported for rotation in bearings on the uprights of the slide 4'; rotating means in connection with said spindle and preferably consisting of a gear-wheel 10, splined to said spindle and meshing with a pinion 12, fixed to a shaft 13, journaled in bearings on the upper ends of the uprights 7 and 8 and having a band-wheel secured thereto, which may be driven from any suitable source of power; adjusting means in connection with said slide 4' and shown consisting of a screw 15, rotatably supported in a bearing 16 on the bed B and having a screw-threaded bearing in a fixture on the slide and having at the outer end thereof a hand-wheel 17, whereby said screw may be turned to adjust the screw-slotting means with relation to the blank carrying and presenting means, and adjusting means, hereinafter described, in connection with the saw-spindle and effective for adjusting the saw in a plane intersecting its plane of rotation.

The spindle 9 and shaft 13 are shown supported in parallelism and in the same vertical plane, and the inner or saw end of the spindle is shown supported in a bearing 18, adjustably secured to a horizontally-disposed pin or support 18', which is secured to and extends outward from the upright 7, below and preferably at one side of the spindle 9, as will be understood by reference to said Figs. 1, 2, and 3 of the drawings.

To facilitate the adjustment of the saw-spindle longitudinally or in a plane at right angles to and intersecting the plane of rotation of the saw and blank-grasping disks, said

spindle has one end thereof—the right-hand end in Fig. 2—externally screw-threaded, as at 19 and 20, at opposite ends of its journal 21, the outer screw-threaded end of the spindle being diametrically reduced, and said screw-threaded portions are provided with internally-screw-threaded collars 22 and 23, respectively, which normally bear at their inner faces against the adjacent end faces of the bearing, and the gear-wheel 10 is splined to said spindle, as shown in dotted lines, to permit the shaft to have longitudinal movements through the hub thereof. When it is desired to adjust the spindle longitudinally toward the right hand in Fig. 2, the collar 23 will be loosened or screwed inward on the screw-threaded portion 20, after which the collar 22 will be screwed inward on the screw-threaded portion 19, which will draw the spindle toward the right, and when it is desired to adjust the spindle toward the left hand the collar 22 will be loosened and the collar 23 screwed outward upon the spindle, as will be obvious by reference to Fig. 2.

The bearing 18 may be adjusted longitudinally of the support 18', as required, said bearing being shown having a split collar encircling the pin or support 18' and being secured thereto by a screw extending through flanges on divided portions of said collar.

The rotative screw-blank carrying and presenting means in the preferred construction and organization thereof (shown in the accompanying drawings) comprises a slide 5', adjustably supported on the slideway 5 and having an elongated bearing 24, disposed parallel to the longitudinal axis of the slide, with its axis in substantial parallelism with and preferably in the same horizontal plane as the axis of the saw-spindle, and also having horizontally-disposed transverse bearings 25 and 25', located above said longitudinal bearing; a blank-carrier spindle 26, supported for rotation in said elongated bearing; rotating means in connection with said spindle, shown consisting of a worm-wheel 27 fixed to one end thereof and meshing with a worm 28 on a worm-shaft journaled in the transverse bearings 25 and 25', and which shaft has secured to the outer end thereof a band-wheel or pulley 29, adapted to be driven from any suitable source of power, and a screw-blank carrier mounted on the inner end of said spindle and consisting of two coöperative blank-grasping disks *d* and *d'*, respectively, one of which is fixed to the spindle 26 and the other of which is supported upon the end of said spindle for lateral movements toward and away from the fixed disk. The two blank-grasping disks *d* and *d'* being substantially of duplicate construction, a detail description of one of said disks will suffice for an understanding of the construction of both disks, the only difference in construction of one disk over that of the other being in the provision of a smooth central bore in the laterally-movable disk *d*, through which the reduced end 26'

of the spindle 26 extends, and which bore is slightly larger in diameter than the diameter of the end 26' of said spindle to permit said disk to be deflected or set at an angle with relation to the disk d' , which disk d' is shown (see Fig. 4) having an internally-screw-threaded central opening fitting an externally-threaded portion of the end 26' of the spindle.

In the preferred form (shown in the accompanying drawings) each blank-grasping disk consists of a disk-like member 30, having a ring-like member or annulus 31 removably secured to the inner face thereof, with its periphery flush with the periphery of the discous member 30. Each ring or annulus 31 is shown having formed in one side face thereof, at the periphery, a multiplicity or series of radially-disposed blank-receiving recesses 32 of one size and having formed in the opposite face thereof correspondingly-disposed recesses of another size, the recesses on adjacent faces of both the ring-like members of the disks d and d' corresponding to one another and being adapted for holding between them a plurality of screw-blanks, with their axes radial to the axis of the spindle, or substantially so, and the recesses on non-adjacent faces of the ring-like members d and d' also corresponding to one another, so that when the ring-like members are secured to their disk-like members in reverse relation they will be adapted for receiving and holding screw-blanks of a considerably larger or smaller diameter, as the case may be. These ring-like members 32 are shown removably secured to their respective discous members 33 by means of screws 34, extending through the said discous members from the outside thereof and having screw-threaded bearings in transverse openings in said ring-like members.

The screw-ejector E in the preferred form thereof (shown most clearly in Figs. 1 and 3 of the drawings) consists of an ejector-plate E, which constitutes the ejector proper, disposed between adjacent faces of the disks d and d' and having an ejecting-face 35 disposed in the path of the screws s' in such position that when the screws have arrived at a point below the axes of the disks the inner ends of the shanks thereof will strike the ejector-face 35 of the ejector E and will be disengaged and thrown out from between the disks. This ejector or plate E is shown supported at the inner upper end thereof on the reduced end 26' of the spindle 26 and is shown fixed at its outer end to a bracket 36, fixed to the slide 5', on which said spindle is mounted.

In the preferred construction and organization thereof (shown most clearly in Figs. 1 and 2) the disk-closing means F consist of a slide 6', supported on the slideway 6 for movement in a plane transverse to the plane of rotation of the disks d and d' and having an elongated bearing 37 disposed in parallelism

with the axis of the saw-spindle, a disk-closing member or bunter 38, supported in the bearing 37 for independent adjustment longitudinally thereof and having at the outer end thereof a roller 39, in bearing engagement with the face of the laterally-movable disk d at a point substantially in horizontal alinement with the axis of said disk and in close proximity to that portion of the periphery adjacent the slotting-saw s , and adjusting means in connection with said disk-closing member, shown consisting of an adjusting-screw 40, having a screw-threaded bearing in the rear end of the bearing 37 and abutting against the rear end of the member 38, and a set-screw 41 extending transversely through said bearing 37 and engaging said member 38.

For the purpose of holding the slide 6' in its adjusting position on the slideway 6 said slide is shown divided longitudinally and clamped to the slideway 6 by a clamp-screw 42, extending through one portion and having a screw-threaded bearing in the other portion of said slide, as will be understood by reference to Fig. 3 of the drawings.

By constructing the blank-grasping disks as heretofore described and arranging one disk so that it may be moved toward and away from the other and by providing disk-closing means such as described for retaining the disks with their work-grasping faces in oblique relation, as shown in Fig. 1, the blank-receiving recesses 32 will accommodate screws of considerable variation in diameter—that is to say, the disk-closing means may be adjusted so that the operative relation between the grasping-faces of the disks d and d' may be varied according to the sizes of screw-blanks it is desired to slot, thus allowing each set of blank-receiving recesses to have their effective diameters varied within certain limits by the adjustment of one disk with relation to the other.

The saw s will be adjusted and set with its periphery in the proper relation to the disks to cut a slot of requisite depth in the screw-blanks carried by said disks and may be adjusted in the direction of the plane of its axis, as before described, to bring the central portion of the cutting edge thereof in alinement with the center of the space between said disks or in exact central relation with the axis of the screw-blanks.

By reference to Fig. 1 it will be seen that that portion of the peripheries of the disks d and d' adjacent the saw are in closed relation and that the diametrically-opposite portions of said disks are spread apart or are in open relation. The operator sits adjacent the open portion of the disks and drops the screw-blanks successively into successive blank-receiving recesses as they come into open relation, said blanks being carried around with the disks in the direction of the arrow in Fig. 3 and are brought with their outer ends into contact with the periphery of the saw edge, which is preferably rotating in a direction

corresponding to that of the disks, but at a much higher velocity.

It will be obvious that the driving mechanism, in connection with the slotting means and the blank carrying and presenting means, may be variously modified without departing from this invention, and it will also be obvious that various modifications may be made in the construction of other elements of the machine within the purview of this invention.

We claim—

1. A slotting-machine including a rotative slotting-saw supported for adjustment longitudinally and transversely of its axis of rotation; a spindle supported in parallelism with the axis of the saw; two blank-grasping disks one of which is fixed to said spindle and the other of which is loosely mounted on the same spindle for tilting movement, and each of which disks has, removably secured to the inner face thereof, a ring having on one side face a series of radially-disposed recesses of one size and having in its opposite side face a similar series of recesses of another size, whereby the grasping-disks may be adapted to different-sized screw-blanks by reversing the rings; a slide supported for adjustment longitudinally of the axis of the disks; and a bunter adjustably mounted on said slide and bearing against the loosely-supported disk.

2. In a screw-blank-slotting machine the combination, with slotting means, of screw-blank carrying and presenting means including a spindle-supporting slide; a spindle mounted in bearings on said slide; means for rotating said spindle; two blank-grasping disks one of which is fixed to, and the other of which is tiltably mounted on, the same spindle; means for holding one disk in oblique relation to the other; and an ejector fixedly mounted on the slide and extending between the adjacent faces of the two disks in position to engage and eject successive screws during the rotation of said disks.

3. In a slotting-machine the combination, with a rotative slotting-saw and with independent means for adjusting the same in the plane of its rotation and transversely of said plane, of a spindle supported in parallelism with the axis of rotation of the saw; two blank-grasping disks, one of which is fixed to, and rotates with, said spindle, and the other of which is tiltably mounted upon said spindle for vertical movement; a worm-wheel fixed to this spindle; a driving-shaft having a worm meshing with the worm-wheel; a slide supported in coöperative relation with the tiltable disk; a bunter mounted on said slide and engaging the outer face of the tiltable disk; and means for rotating the saw and driving-shaft.

4. A screw-blank-slotting machine embodying a rotative saw; means for rotating said saw; a disk-carrying spindle disposed in parallelism with the axis of the saw and having a worm-wheel fixed to one end thereof; two work-grasping disks one of which is fixed securely to, and the other of which is tiltably mounted upon, this same spindle; means including a worm for rotating the spindle; and a disk-closing device supported independent of the spindle and embodying a roller in bearing engagement with the tiltable disk and effective for retaining said disk with its grasping-face in oblique relation to the grasping-face of the other disk.

5. In a screw-blank-slotting machine the combination with a rotative saw, of rotating screw-blank carrying and presenting means consisting of a spindle, two approximately-concentric obliquely-disposed disks one fixed to, and the other loosely mounted on, this same spindle and each having a blank-grasping ring removably secured to the inner face thereof, and each ring having two series of radially-disposed blank-receiving recesses of different sizes on opposite side faces, respectively, thereof; and a bunter in operative engagement with one disk.

6. In a screw-blank-slotting machine, the combination, with the bed thereof having three horizontal slideways, two of which are in substantial parallelism and one of which is disposed transversely of the other two, of three independent carriers or slides supported for adjustment one in each slideway; a horizontally-disposed spindle mounted in bearings on the first slide and having a saw fixed thereto; a horizontal spindle mounted in bearings on the second slide and having two blank-grasping disks one of which is fixed thereto and the other of which is tiltably mounted thereon and both of which have their peripheries adjacent the periphery of said saw; rotating mechanisms in connection with the two spindles; a disk-closing device supported on the third slide in operative relation with the face of the tiltable disk and adapted for retaining those portions of the disks adjacent said saw in closed relation; and adjusting means in direct connection with said disk-closing means and adapted for adjusting the same with relation to the disks independent of the adjustment of the slide carrying such means.

Signed by us at Hartford, Connecticut, this 14th day of April, 1900.

REINHOLD HAKEWESSELL.
EDWIN C. HENN.

Witnesses:

L. C. WOOD,
E. C. WHITNEY.