

(No Model.)

2 Sheets—Sheet 1.

M. C. BOWMAN, A. F. ROSE & C. B. MORSE.
COUNTER SKIVING MACHINE.

No. 483,509.

Patented Sept. 27, 1892.

Fig. 1

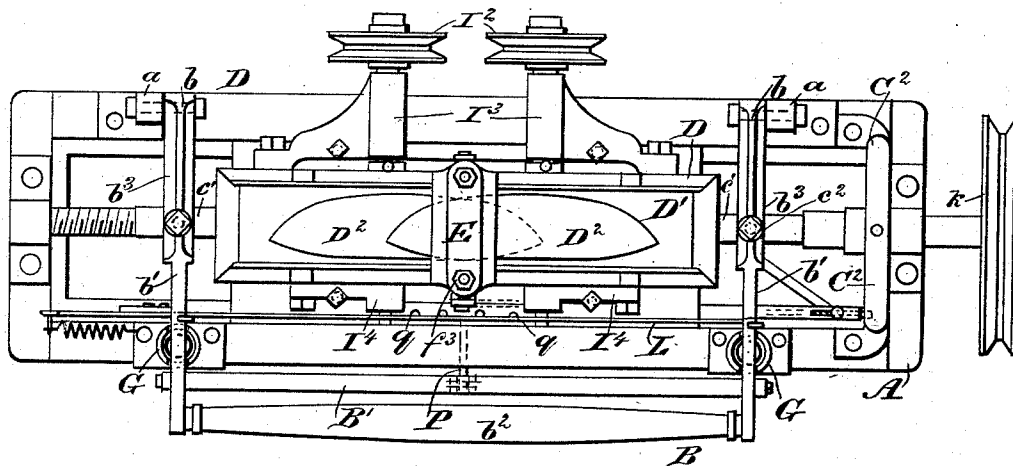
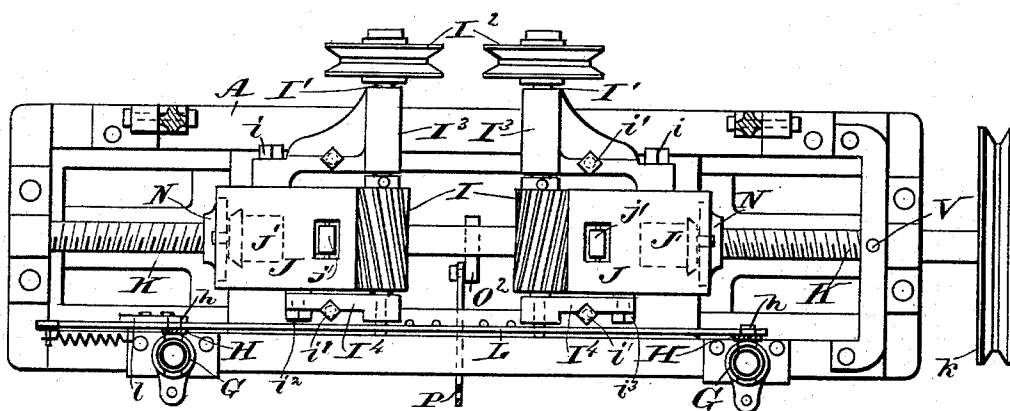


Fig. 2



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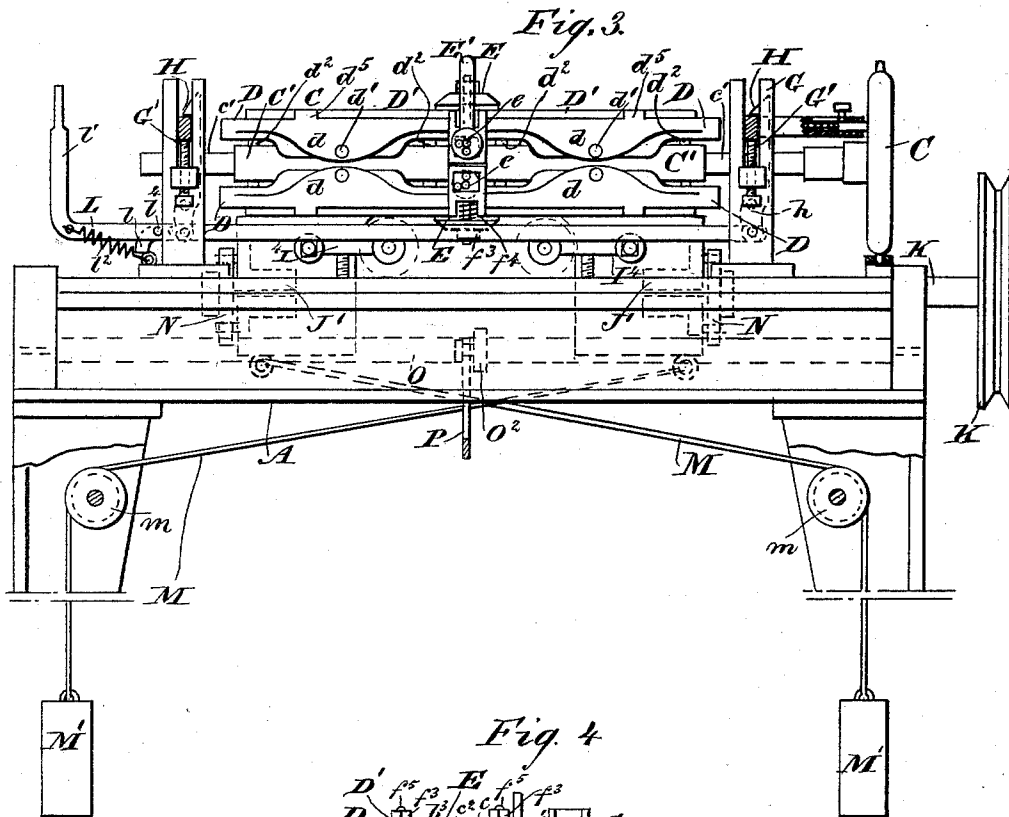


Fig. 5

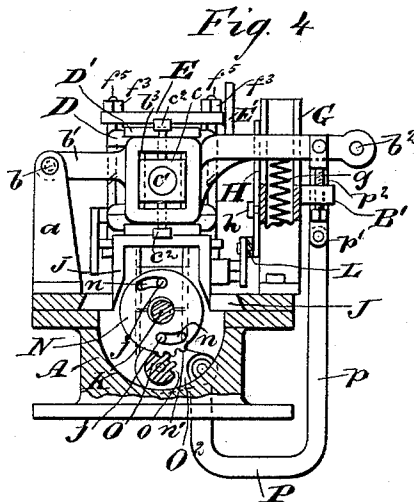
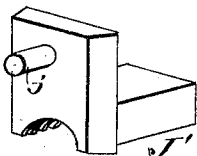


Fig. 6

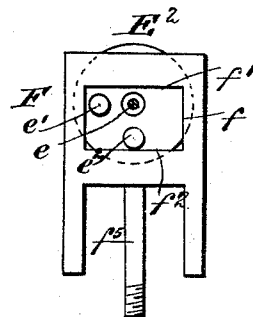
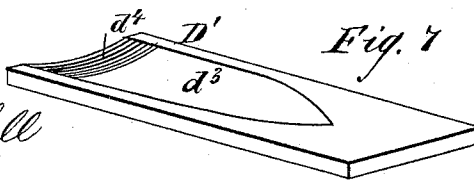


Fig. 7



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UNITED STATES PATENT OFFICE.

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COUNTER-SKIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,509, dated September 27, 1892.

Application filed October 17, 1891. Serial No. 409,085. (No model.)

To all whom it may concern:

Be it known that we, MICHAEL C. BOWMAN, ALBERT F. ROSE, and CYRUS B. MORSE, of New York city, in the county and State of New York, have invented a new and improved Counter-Skiving Machine, of which the following is a full, clear, and exact description.

Our invention relates to machines for skiving counters—that is, either shaving or bevelling or feather-edging the same; and the object of the invention is to increase the efficiency of machines of this character and promote economy in time and labor in their operation.

The invention is distinguished by a rotary work-holder, by means of which the operator may replace finished counters while others are being operated on by the cutters, and which work-holder is automatically raised at the proper moment to move the work out of contact with the cutters, a novel arrangement of rotary cutters which are automatically caused to traverse the counters presented thereto by the work-holder and returned for the next cutting movement, and various novel details and combinations of parts, all as hereinafter particularly described, and defined 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 figures.

Figure 1 is a plan view of a counter-skiving machine embodying our invention. Fig. 2 is a plan view with parts broken away. Fig. 3 is a side elevation with parts broken away. Fig. 4 is a partly-sectional end elevation. Fig. 5 is a perspective view of a portion of one of the split nuts for feeding the cutters in response to the turning of the feed-screw. Fig. 6 is an enlarged detail view of a portion of the counter-clamping devices, and Fig. 7 is a perspective view of one of the seats for the counters.

The frame A of the machine is of suitable form and size to support the various operative parts of the machine, and on standards a thereon there is pivotally secured, as at b, the ends of the side arm b' b' of a vertically-swinging frame B, such side arms being con-

nected together at their opposite ends by a handle-bar b², by means of which the frame may be swung on its pivots.

In each arm b' a box or opening b³ is formed for receiving bearing-blocks c, in which the reduced ends or gudgeons c' of a work-holder C are journaled, screws c² being provided for adjusting such bearing-blocks. The gudgeons c' are secured to or formed on a squared bar C', and on the latter is secured a series of tables D for receiving the counters, said tables being arranged in pairs on the bar C' and each pair diametrically opposite the other, so that when one pair is on the under side of the bar C' and presented to the cutters the other will be on top, in convenient reach of the attendant. The work-holder is turned by a hand-wheel C², secured to one of the gudgeons c'.

The tables D are formed with side flanges d, and pivot-pins d' at the center of each holder pass through opposite flanges and through the bar C' and serve to secure the tables pivotally in place. The tables are adjusted, as desired, with respect to the horizontal plane by means of screws d², which are tapped into the bar C' at the ends of each table.

In the face of each table D a pattern-plate D' is removably held, and is formed with a depression d³ of the shape of the major portion of the counter to be shaped, as shown in Fig. 7, and these plates are changed for counters of different shape or size. At one end a roughened surface d⁴ is formed in the depression to better hold the counters. The counters, as D², are clamped in the work-holder by a clamp-plate E, which ranges transversely of the work-holder C at the meeting ends of each pair of tables D thereof, said clamp-plates being supported on the central studs f² of frames F, which are held to the bar C' in the following manner: A short shaft e is provided in connection with each clamp-plate E and is journaled in bearings on the bar C', and a lever E' is keyed to one end of such shaft e for rocking the same. On the shaft e, also at each end, a disk E² is secured and provided with pins e' e², which extend from the face of each disk into the rectangular opening f in the end frames F. With this construction it

will be seen that as the shaft e is given a quarter-turn by means of the lever E' the clamp-plate E will be brought against the counters on the tables D , or away from the same, as desired. Thus when the shaft e is so turned as to cause the pins e' to strike the edge or wall f' of opening f the frames F will be moved inward and the clamp E , carried thereby, will be thrown against the work to hold the same, whereas if the pins e^2 are caused to strike the opposite edge or wall f^2 of opening f the clamp-plate E will be raised from the counters, permitting removal of the latter. The clamp-plates E are held to the studs f^5 , by nuts f^3 and springs f^4 , surrounding said studs, serve to take up any looseness of the nuts.

In practice the frame B is raised to permit the work-holder to be rotated to present new counters to the cutters hereinafter described, and when the said frame is thrown down into place its side arms b' enter the slotted tubes G and compress spiral springs g therein, and the said arms are held in the lower position against the tendency of the springs g by being engaged by hooks H , which are arranged to be automatically released after each movement of the cutters over the counters, as presently explained.

The rotary knives or cutters I are formed on or secured to shafts I' , which are provided with drive-pulleys I^2 and rotate at right angles to the axis of the work-holder C , said shafts being journaled in the adjustable brackets I^3 I^4 , which are secured to slides J by means of bolts provided with nuts i^2 i^3 , and the brackets are adjusted to raise or lower the cutters by means of set-screws i' . The feed-screw K for actuating the slides J extends beneath the work-holder C and is provided with a driving-pulley k and with right and left threads. The slides J are provided with split nuts J' , which engage the feed-shaft K , and the slides are actuated in opposite directions from the center, or about the center, toward the ends, and as the cutters are rotated while being moved in the direction of the ends of the machine the said cutters will skive the counters on the tables D on the under side of the work-holder C . The hooks H heretofore mentioned are pivoted at h to the tubular posts G , and the short arms thereof or the ends below such pivots are fixedly secured to a releasing-bar L , which ranges longitudinally of the machine. Said bar L has a downwardly-projecting lug l near one end for engaging a projection on one of the slides J for shifting such bar longitudinally, and thus automatically disengaging the hooks H from the frame B , and the bar L is further provided with a handle l' for throwing it by hand when desired, and with a retractile spring l^2 for returning the bar and the hooks H to their normal positions. The nut i^2 on the slide nearest the lug l serves to engage said lug and shift the bar L as the slide moves outward; but any other lug or projection will suffice.

To each slide J is connected one end of a cord M or its equivalent, which cords pass over idlers m and carry weights M' at their ends, the tendency of which weight is to return said slides to the center of the machine. In order that the weights may act to shift the slides after each outward movement of the same, I provide automatic releasing devices for the split nuts J' , as follows: The half-sections of the split nuts J' are each provided with studs or pins j , which extend into or through eccentric-slots n in a disk N , which is fitted on the feed-screw K , the arrangement being such that when the disk is given a partial rotation the split nuts will be disengaged from the feed-screw and permit the weights to shift the slides and their appurtenances. The disk N is provided with teeth n' , that enter correspondingly-formed longitudinal grooves o in a rock-shaft O . On the shaft O is a crank-arm O^2 , to which is connected a yoke P , as seen best in Fig. 4, said yoke being U-shaped and having its outer long arm p extended upwardly to a longitudinal bar B' , carried by the frame B . The arm p is provided with lugs p' , in which set-screws p^2 work and serve to clamp said yoke to the bar B' .

In operation, the counters having been placed on the pattern plates D' of the work-holder, the clamp-plate E is brought down on the same and the work-holder is given a half-turn to bring the counters to the under side, whereupon the frame B is pressed down until its arms are engaged by the hooks H . When thus forced downward, the counters will press on the antifiction-rollers j' , Fig. 2, which are journaled in the upper faces of the slides J to project by their peripheries slightly above the slides, and thus press the counters into the grooves d^3 , so that the edges of the counters will slightly project from the depressions sufficiently to be skived by the cutters I . The downward movement of the frame B will also have carried the yoke P downward, which will rock the shaft O and so turn the disk N as to cause the split nuts J' to engage the feed-screw K , and the cutters will thus be moved longitudinally of the machine. When the nut i^2 of the slide J (shown at the left of Fig. 1) strikes the lug l on the releasing-bar L , said bar will be slightly moved to the left and will disengage the hooks H from the side bars b' of frame B , thus permitting the springs g to throw the frame B upward-carrying with it the work-holder C . As the frame B moves upward it will lift yoke P , and so throw the disk N as to open the split nuts J' and permit the sides and their cutters to be shifted by the weights M' . The inward movement of the slides is limited by stop-pins inserted in apertures q , Fig. 1. By shifting the stop-pins in their apertures the inward movement may be changed to suit the counters being skived. The outward movement of the slides is determined by the position of the lug l on the arm L , such lug being adjustable on the bar, the adjustment being effected by providing two

or more holes l^4 for the securing-bolt of the lug. The tables D are provided with side projections d^5 , which will alone strike the slides J should the work-holder not be raised sufficiently before being turned. When it is desired to swing the frame B to the side of the machine, the yoke P is disconnected therefrom.

Set-screws G' may be provided, if desired, for limiting the downward movement of the frame B.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a counter-skiving machine, a work-holder having seats for the counters at different points around the same, in combination with movable cutters toward and from which the work-holder is movable and means for holding the latter against rotary movement when presented to the cutters, substantially as described.

2. The combination, with the cutting-knives, of a rotary work-holder arranged above such knives and provided with seats for the work at different points therearound and clamps for securing the work to such seats, said work-holder being vertically movable toward and from the knives, the lowermost work-holding seat being presented to the knives when the work-holder is in the lowered position and the upper seat exposed for permitting access thereto, and means for maintaining the work-holder against rotary movement when in such lowered position, substantially as described.

3. In a skiving-machine, the combination, with the knives, of a swinging frame and a work-holder carried thereby and journaled therein for rotary movement, the frame being mounted to permit a free intermittent rocking movement for alternately carrying the work-holder toward the knives and withdrawing it therefrom, and means for holding the work-holder against rotary movement when the frame is moved toward the knives, substantially as described.

4. In a skiving-machine, the combination, with the knives, of a work-holder movable toward and from said knives and having a seat for the counters and a clamp for the same, springs normally tending to throw said work-holder away from the knives, and means for locking said work-holder against the action of the springs, substantially as described.

5. In a skiving-machine, the combination, with the movable knives, of a work-holder having seats for the counters, said seats having depressions, pressure devices for pressing the counters into said depressions, the knives serving to skive the projecting edges of the counters, and means for moving the knives and pressure devices, substantially as described.

6. In a skiving-machine, a work-holder having seats for the counters, said seats being pivotally and adjustably held to said holder, substantially as described.

7. In a skiving-machine, the combination, with a work-holder, of a clamp-plate thereon for clamping the counters and movable supports for such plate, a rock-shaft and a lever thereon, and connections, substantially as described, between the shaft and the clamp-supports for throwing said supports and the clamp-plate thereon by the rocking of the shaft, substantially as described.

8. In a skiving-machine, the combination, with work-holding devices, of rotary knives, slides in which said knives are mounted, and a feed-screw for causing both slides to traverse the work-holder, substantially as described.

9. In a skiving-machine, the combination of a work-holder mounted to rotate, rotary knives, and slides in which said knives are mounted, the slides being movable across the face of the said holder for presenting the knives to the counters held thereon, substantially as described.

10. In a skiving-machine, the combination of rotary cutters, slides in which said cutters are mounted, a frame pivoted to be swung toward and from such cutters, and a work-holder journaled in said frame, the slides being movable across the face of the said holder for presenting the knives to the counters held thereon, substantially as described.

11. In a skiving-machine, the combination, with work-holding devices, of knives reversely actuated, slides in which said knives are mounted, and means, substantially as described, for actuating said slides in opposite directions, substantially as described.

12. In a skiving-machine, knives or cutters reversely actuated, slides in which said knives are mounted, and means, substantially as described, for actuating said slides in opposite directions and for returning them, as set forth.

13. In a skiving-machine, the combination of a work-holder and knives or cutters, the said work-holder having a movement toward and from the knives, and means for giving the latter a sliding movement relatively to the work-holder, locking devices for the said work-holder, and means, substantially as described, for releasing such locking devices by the slides, as set forth.

14. In a skiving-machine, the combination of a work-holder and knives, the former being carried by a frame which is movable toward and from the knives, slides in which said knives are mounted, split nuts on said slides, a feed-screw with which said split nuts engage, and connections between said split nuts and movable frame, substantially as described.

15. In a skiving-machine, the combination of knives or cutters, slides in which said knives are mounted, a work-holder mounted in a frame which is capable of movement toward and from said knives, split nuts carried by said slides, a feed-screw engaged by said split nuts, weights connected with the slides and tending to move the same contrary to

the direction in which they are actuated by the feed-screw, and connections between the split nuts and the frame carrying the work-holder, substantially as described.

5 16. In a skiving-machine, the combination of knives or cutters, slides in which said knives are mounted, a work-holder mounted in a frame which is capable of movement toward and from the said knives, hooks for
10 locking said frame, a releasing-bar for said hooks adapted to be shifted by the slides, split nuts on said slides, a feed-screw engaged by said split nuts, weights connecting with the slides and tending to move the same con-
15 trary to the direction in which they are moved by the feed-screw, and connections between the split nuts and the frame carrying the work-holder, substantially as described.

20 17. In a skiving-machine, the combination of knives or cutters, slides in which said

knives are mounted, a work-holder mounted in a frame which is capable of movement toward and from the knives, hooks for locking said frame, a releasing-bar for said hooks adapted to be shifted by the slides, split nuts 25 on said slides, a feed-screw engaged by said split nuts, weights connected with the slides and tending to move the same contrary to the direction in which they are moved by the feed-screw, a rock-shaft connected with the swing- 30 ing frame, and connections between the said rock-shaft and split nuts, substantially as described.

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Witnesses:

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