2 Sheets—Sheet 1.

O. D. & E. C. WOODBURY.

MACHINE FOR BORING BRUSH-BLOCKS.

No. 195,869. Patented Oct. 2, 1877

Fig. 2.

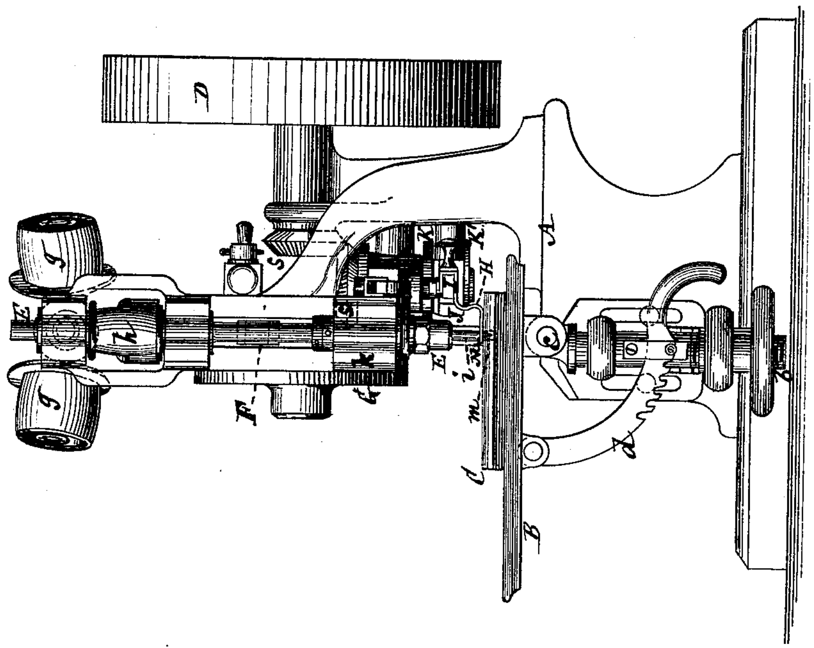
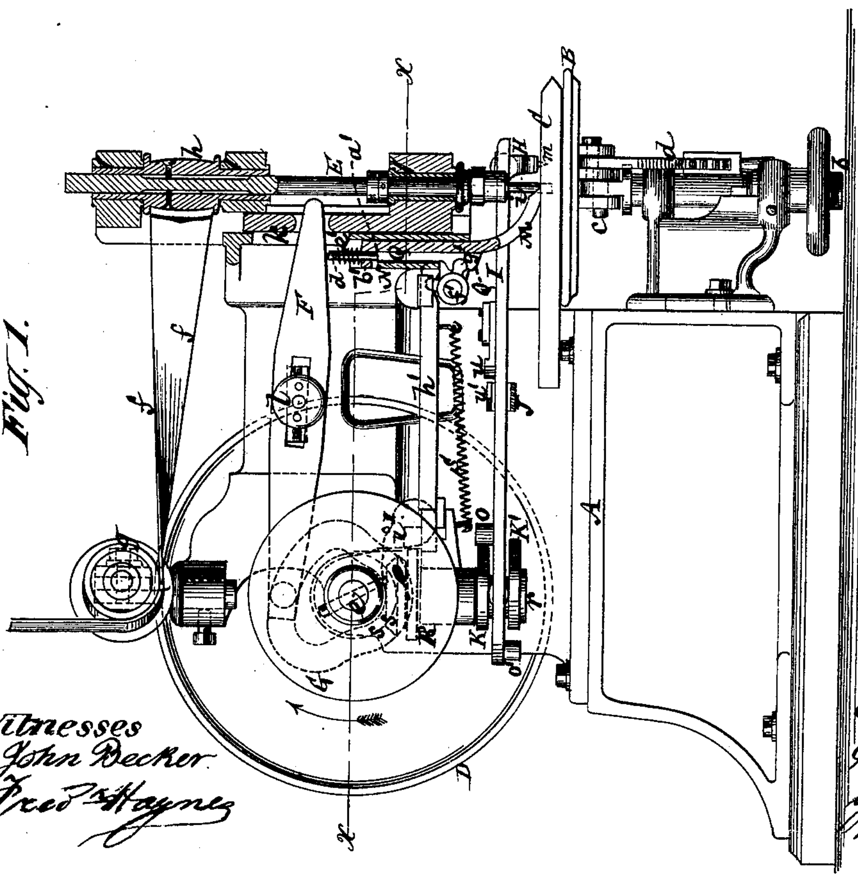


Fig. 1.



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2 Sheets—Sheet 2.

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Fig. 3.

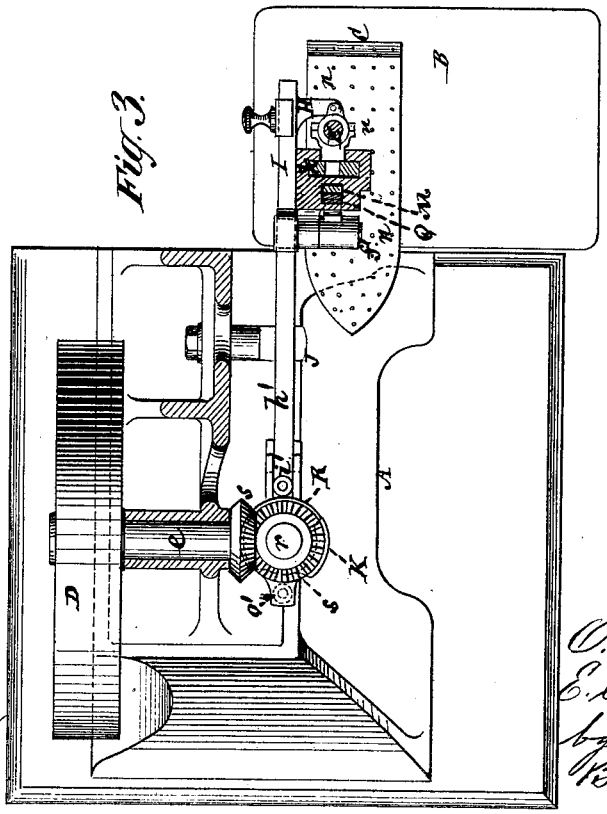


Fig. 5.

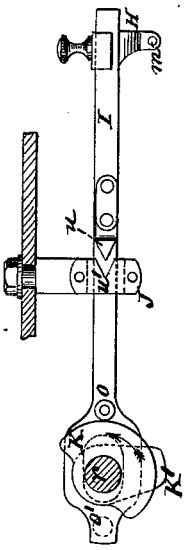
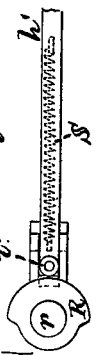


Fig. 4.



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UNITED STATES PATENT OFFICE.

OSCAR D. WOODBURY AND EDWIN C. WOODBURY, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR BORING BRUSH-BLOCKS.

Specification forming part of Letters Patent No. **195,869**, dated October 2, 1877; application filed May 1, 1877.

To all whom it may concern:

Be it known that we, OSCAR D. WOODBURY and EDWIN C. WOODBURY, both of the city of New York, in the State of New York, have invented certain new and useful Improvements in Machines for Centering and Drilling Brush-Blocks and other articles, of which the following is a description, reference being had to the accompanying drawing, forming part of this specification.

This invention is more particularly intended for centering and drilling brush blocks or backs for reception of tufts of bristles; but it is also applicable to other kinds of work in which, as in the case of brush-blocks, the work or article is required to be set and repeatedly shifted or adjusted to bring its surface at regular or irregular spaced distances apart under a drill, for the purpose of drilling therein a series of holes corresponding with the spaced divisions of the surface of the block or article.

The invention consists in a combination, in one and the same machine, of a centerer, operating also as a feeder, to adjust the block or article into position to be drilled at prescribed points or distances apart throughout or over the surface of the work; a drill for perforating said block or article as required after the centerer has adjusted it into position for the purpose; a presser-foot operating to hold the work after it has been adjusted by the centerer, but releasing gripe or hold thereon at or during each successive feed of the centerer; and means of operating said centerer, said drill, and said presser-foot in relation with each other and with the table which carries the work.

The invention also consists in a novel construction of the centering devices, whereby the centerer may be universally adjusted or shifted in various directions by hand to bring its centering point or projection into any one of a series of indented marks made in the block or article to be drilled, yet will invariably and automatically operate to center the work true to the drill.

Furthermore, the invention consists in a combination, with the presser-foot, of certain indirect means for operating said foot, whereby the presser-foot is automatically lifted free of the work, regardless of the thickness of the latter, when it is required to adjust the work under the drill, and a uniform depth of hole throughout the whole series of holes in the block or article having a flat or regular surface is insured.

Figure 1 of the accompanying drawing represents a partly-sectional side view of a machine having our invention applied, and with a brush-block under operation therein; Fig. 2, a front end view of the same; and Fig. 3, a horizontal section on the irregular line *x x*. Fig. 4 is a plan view of a driving-cam and portion of the operating-rod of the presser-foot. Fig. 5 is a plan view of the centering devices and means for operating the combined centerer and feeder.

A is a bed, on which the working mechanism and frame or frames carrying the same are mounted.

B is the table on which the brush-block C or work to be drilled is placed. This table B is adjustable up or down by means of a screw, *b*, to adapt the machine to different thicknesses of work, and said table is pivoted, as at *c*, at or near its one end, and provided with a curved locking toothed adjuster, *d*, to vary the angle of inclination of the table surface for the purpose of adapting the machine to drill blocks having different angular surfaces.

D is the main driving wheel or pulley, and *e* its shaft. This driving-pulley may be thrown into and out of gear by means of a clutch, to provide for stopping the machine when introducing the work, and said pulley may be operated by an overhead counter-shaft, from which motion may also be taken to rotate the drill by means of a band, *f*, passing under idlers *g g* and round a pulley, *h*, on the drill stock or spindle E, and through which said spindle is free to rise and fall. Said spindle, carrying the drill *i*, is worked up and down to project the rotating drill into the work and to remove it therefrom after a hole has been drilled. This up-and-down movement of the drill is effected by means of a lever, F, in slotted connection at its forward end with a slide, *k*, which carries the drill-stock, and in gear at its rear end with a grooved cam, G, on the shaft *e*. This lever may have its fulcrum *l* made adjustable to vary the length of stroke of the drill according to the depth of the holes to be drilled.

H is the centerer proper, provided with a centering point or projection, *m*, which is entered by hand into the first or any one in a series of indented marks, *n n*, previously made in the brush-block, and corresponding with the required spacing of the tufts of bristles. Said centerer is attached, preferably in an adjustable manner, to the outer end or portion of a bar, I, which forms part of the entire centerer. This bar I works in a free or loose manner through a support or guide, J, and is moved backward and forward at intervals by means of cams K K′ acting against studs or rollers *o o′* on said bar, and attached to an upright shaft, *r*, which receives its motion by bevel-gears *s s* from the main shaft *e*.

The studs or rollers *o o′* are arranged at such a distance apart that there is lost motion between them and the cams K K′.

Formed or secured in or on the support or guide J and bar I are male and female centering devices *u u′*, which may be of a V or other suitable shape, and which serve, at the close of the forward stroke of the bar I, to truly center under the drill *i* (when the latter is raised) that one of the indented marks, *n*, into which the centering-pointer *m* may have been adjusted, and in thus centering the brush-block C relatively to the drill *i* the center H acts as a feeder of the block. Nevertheless, the bar I is adjustable, lengthwise, by its lost motion, between its studs or rollers *o o′* and the cams K K′, and is, furthermore, adjustable laterally and up and down, by its loose fit within the guide J, to admit of the point *m* of the centerer being entered by hand in any one of the indented marks *n* in a row or series of such marks in or on the block C, as the latter is freely held or turned about by hand on the table B. Furthermore, the cam G and cams K K′ are so timed or arranged in relation with each other that the centerer H cannot be pushed back to interfere with the drill. The universal adjustment of the centerer H, by its free bar I, allows of said centerer being adjusted to various distances apart of the spacing-marks *n*, yet always bringing one of the latter under the drill by the centering attachments or devices *u u′*, and after which the centerer H moves away to allow of the rotating drill *i* coming down and drilling a hole in the place of the indented mark brought by the combined centerer and feeder under the drill.

To hold the block C, after it has been adjusted as described, by the combined centerer and feeder, with its indented mark *n*, in the place to be drilled, under or in true relation with the drill, a presser-foot, M, is brought down on the work or block C, and continues to hold the latter firmly down on the table B while the drill is making the hole and the centerer H is moving back over the block, to, in due course, make a fresh feed. Said presser-foot, however, after the completion of each hole in the block, is automatically raised or wholly relieved from pressure on the block C, to provide for the subsequent easy movement and manipulation of said block or work on or over the table. To do this, and to make the presser-foot adapt itself to different thicknesses of work, and so that holes of a uniform depth may be drilled in the block or work, said presser-foot is indirectly operated and controlled. Thus said presser-foot is free to work up and down within a fixed guide, N, and is raised, when it is required to lift the presser-foot from the work, by a shoulder, *a′*, of an independent lifting-bar, Q, striking or coming in contact with a head, *b′*, on the upper end of the presser-foot. This lifting-bar Q slides up and down within the fixed guide N, and is constructed with a stem, *d′*, above the shoulder *a′*, which stem passes loosely through the head *b′* of the presser-foot, and carries a spring, *e′*, that bears the presser-foot down on the work.

The independent lifting-bar Q is intermittingly operated, both to lift the presser-foot, when required, and to liberate it, so that the spring *e′* will cause the foot to be borne down on the work in proper relation with the drill and centerer, as hereinbefore described, by means of a toe, *g′*, on a rock-shaft, *f′*, which is actuated by a rod or bar, *h′*, that is worked backward and forward at intervals by an eccentric, R, on the shaft *r* and a spring, S, pulling in a reverse direction on said bar. The eccentric R operates against a stud or roller, *i′*, on the bar or rod *h′*, which connects at its forward end by a toe with the rock-shaft *g′*.

We claim—

1. The combination of the work-centerer H, having a centering-point, *m*, the bar I, by which said centerer is reciprocated, the drill-stock E, means for lifting, lowering, and rotating said stock with its attached drill, the presser-foot M, and means for lifting said presser-foot after the drill has performed its work, the whole being organized for operation of said centerer, said drill, and said presser-foot in relation with each other and with the table B, substantially as specified.

2. The centerer H, with its attached bar I, having reverse automatic motions at intervals in direction of the length of said bar, and hung so as to be capable of universal adjustment, in combination with the male and female centering devices *u u′*, and the drill-stock E, carrying a drill, *i*, essentially as described.

3. The combination of the presser-foot M, the fixed guide N, the independent and intermittingly operated lifting-bar Q, having a shoulder, *a′*, the head *b′* of the presser-foot, the spring *e′*, and means for raising and tripping said lifting-bar, substantially as shown and described, and for the purposes herein set forth.

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