

(No Model.)

2 Sheets—Sheet 1.

A. C. ESTABROOK.

MACHINE FOR MILLING BONE BLANKS FOR HANDLES.

No. 347,699.

Patented Aug. 17, 1886.

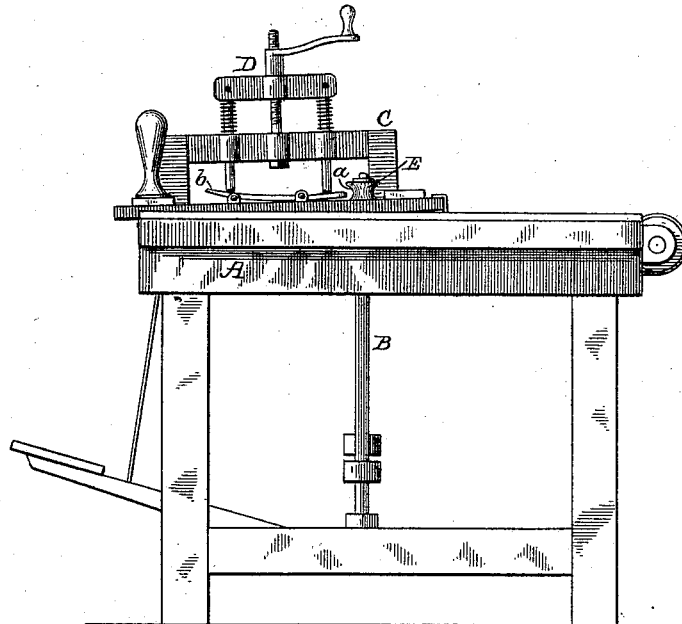


Fig. 1.

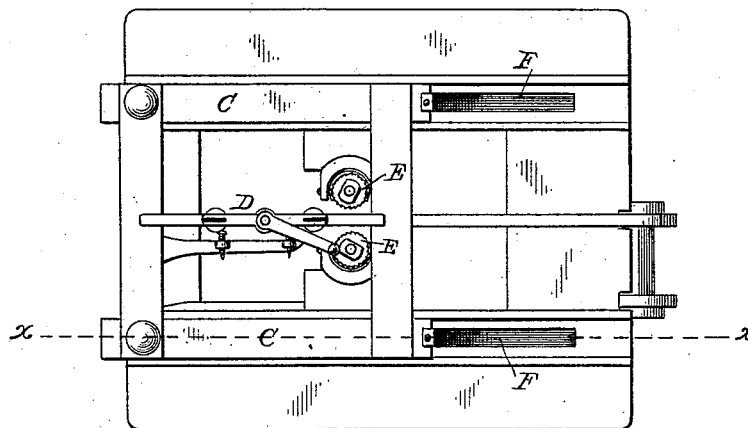


Fig. 2.

Attest:
Philip F. Larner.
H. Barlett.

Inventor:
Alanson C. Estabrook.
By *Wm. C. Mord*
Attorney.

(No Model.)

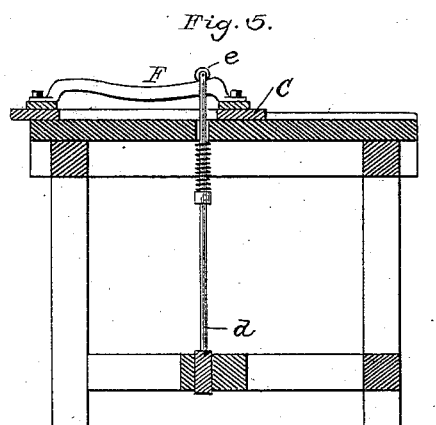
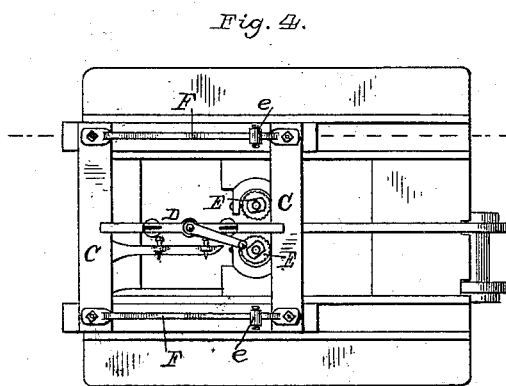
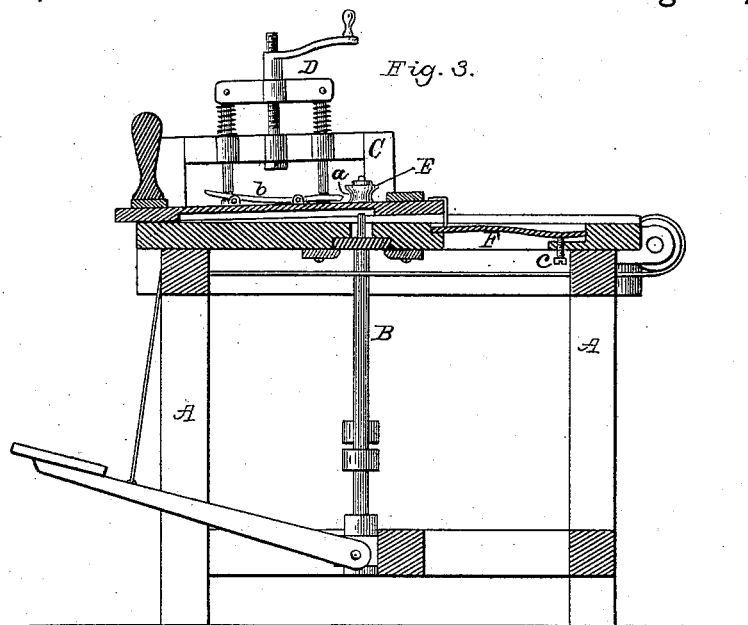
2 Sheets—Sheet 2.

A. C. ESTABROOK.

MACHINE FOR MILLING BONE BLANKS FOR HANDLES.

No. 347,699.

Patented Aug. 17, 1886.



Attest:
Philip F. Larnes.
H. Barth

Inventor:
Alanson G. Estabrook.
By: *Wm. C. Ford*
attorney.

UNITED STATES PATENT OFFICE.

ALANSON C. ESTABROOK, OF FLORENCE, MASSACHUSETTS, ASSIGNOR TO
THE FLORENCE MANUFACTURING COMPANY, OF SAME PLACE.

MACHINE FOR MILLING BONE BLANKS FOR HANDLES.

SPECIFICATION forming part of Letters Patent No. 347,699, dated August 17, 1886.

Application filed July 9, 1884. Serial No. 137,191. (No model.)

To all whom it may concern:

Be it known that I, ALANSON C. ESTABROOK, of Florence, (Northampton,) in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Machines for Milling Bone Blanks for Tooth-Brushes; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description of my invention.

My said improvements are especially intended for rounding the edges of tooth-brush blanks, and they are applicable to such machines as are shown and described in my prior Letters Patent No. 260,376, dated July 4, 1882, and No. 279,728, dated June 19, 1883. In my said prior machines no provisions were made for performing the special service indicated, which of necessity involves concave-faced milling-heads which can impart to the blanks beveled or rounded convex edges. It is well known that bone tooth-brush blanks have various longitudinal curves or bends due to the original form of the bone; but, as will be understood from my said prior Letters Patent they are classified by me, so that all of any one class will have substantially the same bends or curves. Heretofore the edges of these blanks have either been rounded by hand-tools or by a single concave-surfaced milling-head, against which the blank is held by hand and moved along, thus rounding one edge of the blank at a time. I have now for the first time organized a machine with which both edges of any blank may be rounded, whether it be a straight blank or one having the most radical curves or bends, it being obvious that each blank must be presented to the milling-heads in a progressively-varying vertical plane corresponding more or less closely to the variation of the blank from a straight line. I accomplish this end by the combination of a pair of concave-faced milling-heads and a sliding carriage having a clamp for properly holding a bone and presenting it to the milling-heads and bed-forms, which vary the vertical position of the bone with relation to the milling-heads, or, as an equivalent thereof, which vary the vertical position of the milling-heads to the bone as carried by its clamp.

To more particularly describe my invention, I will refer to the accompanying drawings, in which Figure 1, Sheet 1, is a side elevation of a machine embodying my invention in its best form. Fig. 2 is a top view of the same. Fig. 3, Sheet 2, is a longitudinal vertical section of the same on line *x*, Fig. 2. Figs. 4 and 5 illustrate in top view and section a modification of said machine.

The frame A, milling-head spindles B, sliding carriage C, forms for varying the positions of the milling-heads in a horizontal plane during the sliding movement of the carriage, and bone-clamp D on said carriage are substantially as shown and described in my said prior Letters Patent, to which reference may be had if need be.

The milling-heads E cannot have straight faces, as in my prior machines, but must have concave faces *a*, so that when a bone blank held firmly in the clamp is passed between them by the forward sliding movement of the carriage its edges will be simultaneously beveled or rounded from end to end with practical uniformity. It will be understood that the working-faces of the heads will be concave whether the bone-blank edge is to be rounded or beveled, the contour of said faces being correspondingly shaped. In thus beveling or rounding the edges of a straight blank the carriage will operate like those described in my said prior Letters Patent; but it will be obvious that for operating upon a blank which is not straight either the milling-heads must be lifted or lowered, or both, or the bone be lifted or lowered, or both, during the advancing movement of the bone-clamp. As shown in Figs. 1, 2, and 3, the bone-clamp containing a bone blank *b* is thus moved in a vertical plane by means of the bed-forms F, which correspond in surface contour with the bone, and constitute novel features in this combination. These bed-forms support the sliding carriage, and therefore its longitudinal movement will be accompanied by movements vertically in exact conformity with the bearing-surface of the bed-forms, and it therefore will properly present the edges of the bone to the concave heads. These bed-forms are each mounted upon screws *c*, by which they can be accurately adjusted vertically for imparting to the bone-clamp the

precise horizontal and vertical movements desired, and they are readily detachable, a special set of them being required for each radial variation in the longitudinal character of the bone blanks to be worked. In working some blanks one pair of these bed-forms will be sufficient, there being one at each side of the machine; but two on each side will enable general results to be obtained, because either of said two pairs can sometimes be relied upon without using the other pair, or both can be used when requisite.

In Figs. 4 and 5 the sliding carriage has no vertical movement; but the milling-head spindles are mounted in a vertically-sliding step-block suspended on rods *d*, forced downward by springs, and having a yoke at their upper ends containing a roller, *e*, which bears upon a bed-form, *F*, one of which is located on each side of the sliding carriage *C*, so that as the carriage is moved to and fro the milling-heads are lifted and lowered in exact conformity

with the upper surface of the bed-forms by which the suspending-rollers and the spindles are supported. Owing, however, to the rapid rotation of the milling-heads and the importance of avoiding a liability of undue vibration thereof, I prefer to use the bed-forms as organized in Figs. 1 to 3, inclusive.

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

The combination, substantially as hereinbefore described, of the concave-faced milling-heads, the sliding carriage, the bone-clamp mounted on said carriage between said heads and the bed-forms which vary the relative positions in a vertical plane of the concave faces of the milling-heads, and a bone blank held by the clamp, during the sliding movements of said carriage.

ALANSON C. ESTABROOK.

Witnesses:

H. K. PARSONS,

FRANK N. LAAK.