No. 648,759. Patented May 1, 1900.

J. KOENIG & N. DEDRICK.

COMB TOOTH BEVELING MACHINE.

(Application filed Oct. 30, 1899.)

(No Model.) 4 Sheets—Sheet 1

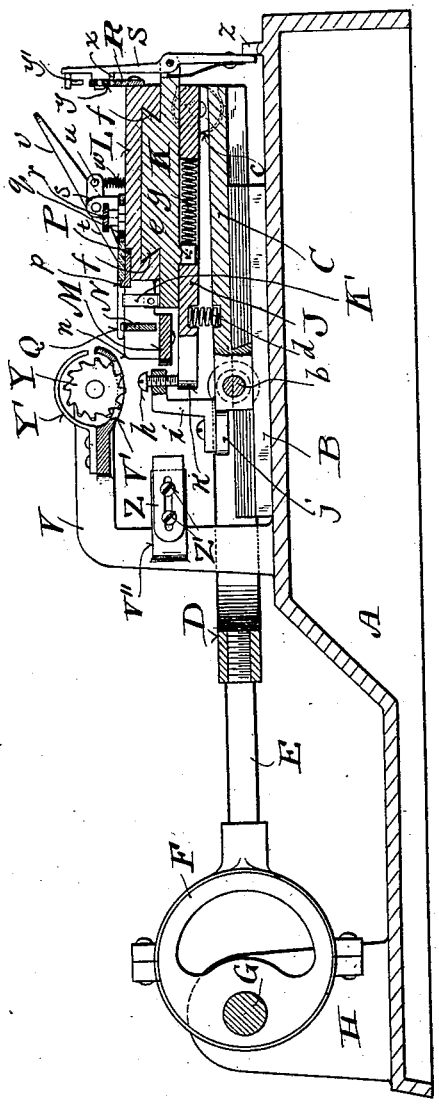

Fig. 1.

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N. E. Oliphant

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(No Model.) 4 Sheets—Sheet 2.

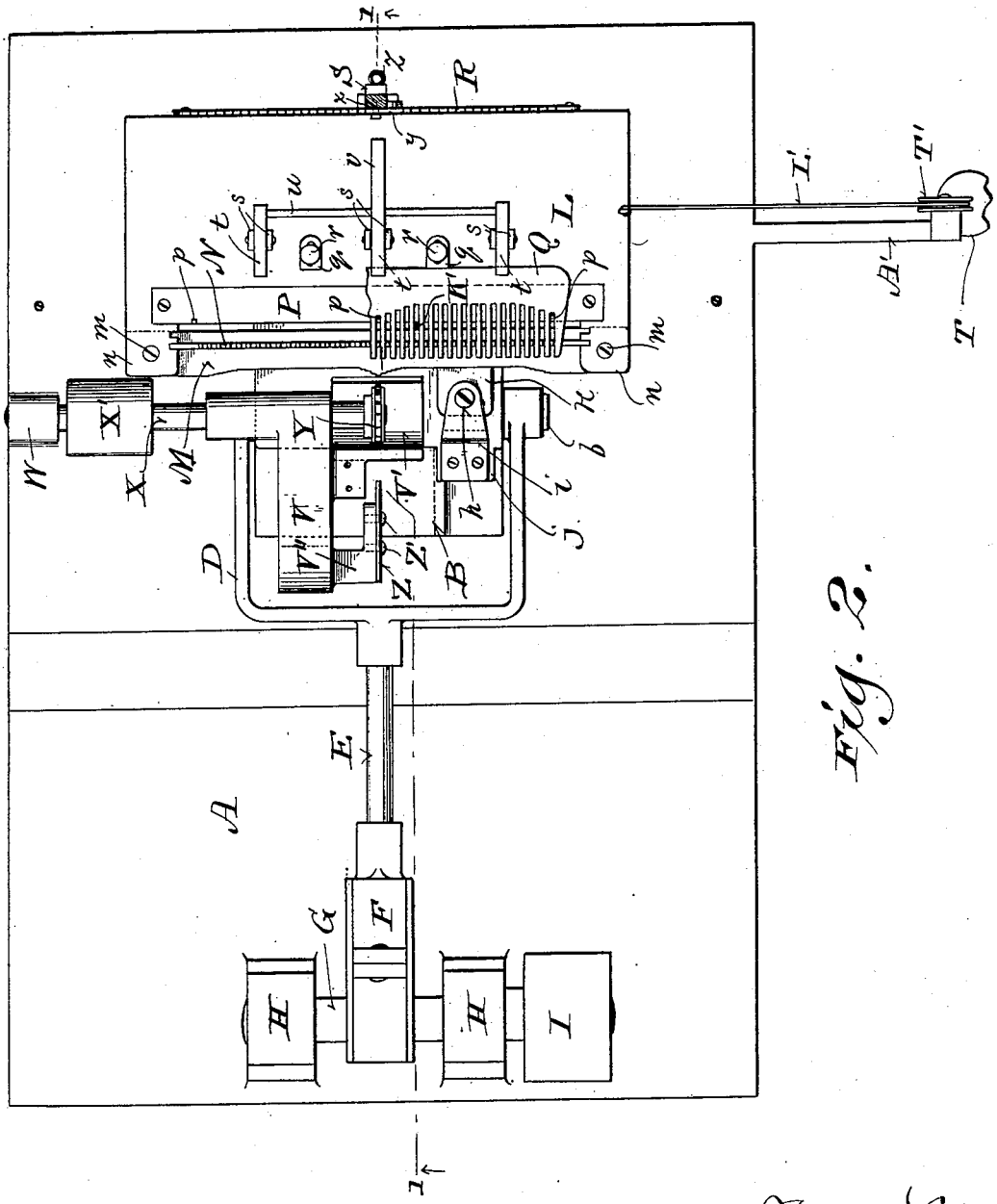

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

Fig. 3.

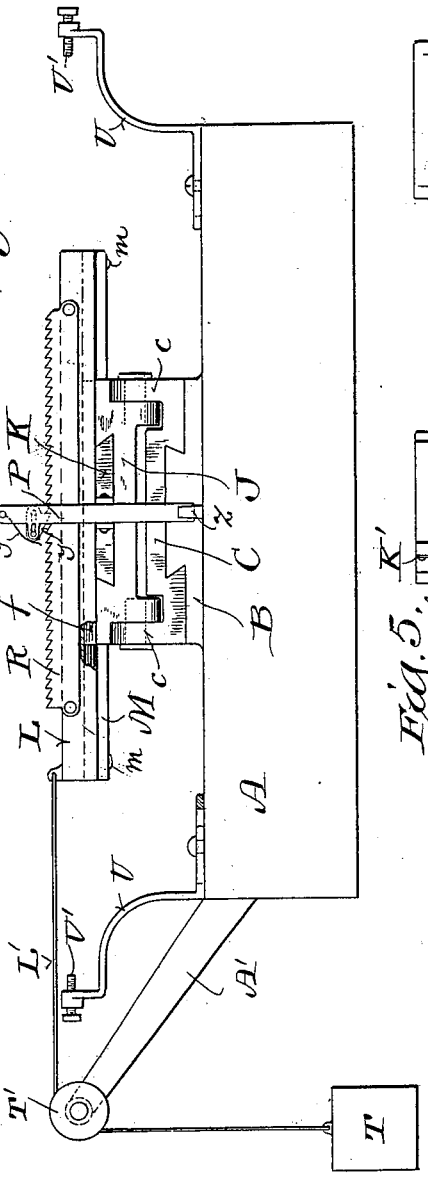

Fig. 7.

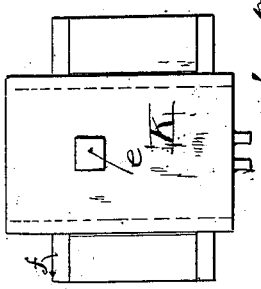

Fig. 6.

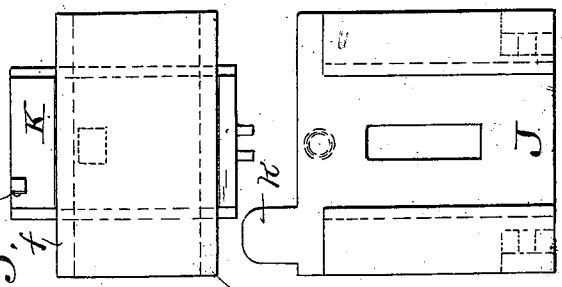

Fig. 5.

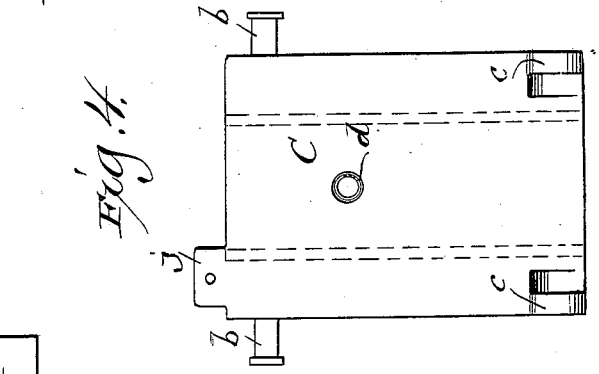

Fig. 4.

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(No Model.) 4 Sheets—Sheet 4.

Fig. 9.

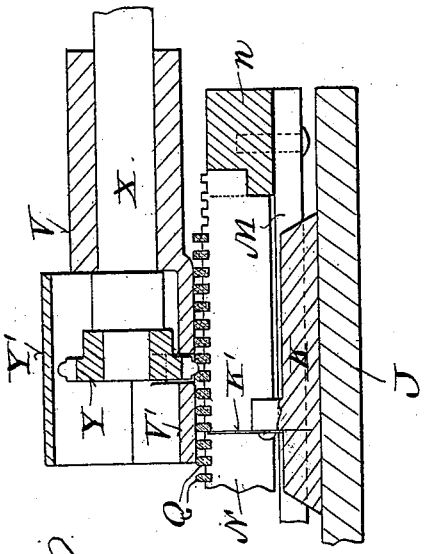


Fig. 10.

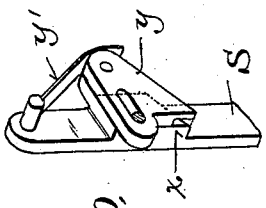


Fig. 8.

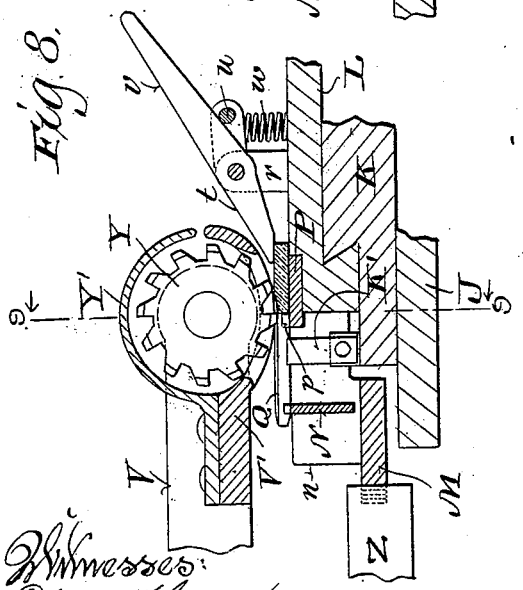
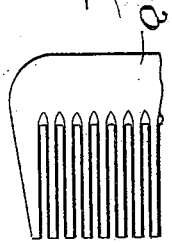


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOSEPH KOENIG, OF TWO RIVERS, AND NICHOLAS DEDRICK, OF MANITOWOC, WISCONSIN, ASSIGNORS TO THE ALUMINUM MANUFACTURING COMPANY, OF TWO RIVERS, WISCONSIN.

COMB-TOOTH-BEVELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,759, dated May 1, 1900.

Application filed October 30, 1899. Serial No. 735,201. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH KOENIG, a resident of Two Rivers, and NICHOLAS DEDRICK, a resident of Manitowoc, in the county of Manitowoc and State of Wisconsin, citizens of the United States, have invented certain new and useful Improvements in Comb-Tooth-Beveling Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention has especial reference to the manufacture of aluminium combs; and its object is to provide simple economical self-feed machines for bevel-finishing of comb-teeth corners, said invention consisting in certain peculiarities of construction and combination of parts hereinafter particularly set forth, with reference to the accompanying drawings, and subsequently claimed.

Figure 1 of the drawings represents a vertical longitudinal section of a machine in accordance with our invention, this view being indicated by line 1 1 in the succeeding figure; Fig. 2, a plan view, partly in horizontal section; Fig. 3, a rear elevation of the machine; Figs. 4, 5, 6, and 7, detail parts of said machine; Fig. 8, a detail sectional view similar to part of the first figure, except as to position of the comb-carrier therein; Fig. 9, a detail sectional view indicated by line 9 9 in the preceding figure; Fig. 10, a perspective view illustrating part of an escapement-movement embodied in said machine, the slip-dog in this view being moved back against an opposing spring; and Fig. 11, a plan view of a finished comb.

Referring by letter to the drawings, A indicates the base of our machine, a portion of the same being higher than the remainder. On the higher level of the base is a guide-block B for a carriage C, that reciprocates in a direction longitudinally of said base, this carriage being provided with lateral studs *b*, engaged by boss ends of a yoke D, in union with a pitman E, by which it is connected to an eccentric F on a shaft G, that turns in standards H, rising from the lower level of the aforesaid base, said shaft being provided with a pulley I for a driving-belt.

In pivotal connection with ears *c* of carriage C is a plate J, provided with a central slot in a direction longitudinally of the machine, and this plate rests on a spiral spring *d*, seated in said carriage. Engaging the plate-slot is a lug *e*, depending from a superimposed cross-plate K, the upper portion of this plate being a guide *f* for a carrier L, at right angles to the one aforesaid, and a spiral spring *g* is supported between said lug and superimposed plate. A set-screw *h* is arranged in a bracket *i* on a lug extension *j* of carriage C to bear against a similar extension *k* of slotted plate J, and by adjustment of the screw the normal tilt of this spring-opposed pivotal plate and parts in connection therewith is regulated.

By means of screws *m* a templet M is detachably connected to the under sides of lugs *n*, that extend from carrier L, and engaging vertical inner grooves in the lugs is a spacing-rack N, said lugs being shown provided with two sets of the vertical grooves in order that the position of the spacing-rack may be varied. Back of the spacing-rack the carrier L is provided with a recess, in which a plate P is made fast flush with the top of said carrier, and extending up from this plate are stop-lugs *p*, that come in interstices between the teeth of a comb Q, supported on the aforesaid carrier. The comb is held snug against the stop-lugs *p* by slotted plates *q*, secured in adjusted position on the top of carrier L by set-screws *r*, engaging their slots, and in pivotal connection with ears *s*, rising from said carrier, is a comb-clamp comprising angle-dogs *t*, connected by a rod *u* with an intermediate hand-lever *v*, that also constitutes part of the clamp, said angle-dogs being opposed at their ends farthest from the comb by spiral springs *w*, seated on the aforesaid carrier.

By the means above specified a comb is accurately positioned on the carrier L, the spacing-rack serving to correctly aline the comb-teeth, and a feed-rack R in detachable connection with said carrier coöperates with fast and slip dogs *x y*, supported parallel to each other by a spring-controlled lever S, fulcrumed between its ends to the superimposed plate K, above specified, the lower end of this lever being in opposition to a lug *z*, ris-

ing from the machine-base. The slip-dog is in slot-and-pin connection with the fast dog on lever S, and a leaf-spring y' is suspended from the upper portion of said lever to oppose one end of said slip-dog.

The mechanism set forth in the preceding paragraph constitutes an escapement for the comb-carrier L, and a flexible runner L', attached at its ends to said carrier, and a weight T is supported by a pulley T', suspended from an arm A' of the machine-base, the latter being provided with brackets U, that support stop-screws U' in opposition to said carrier, whereby the limit of movement on the part of this carrier in either direction may be accurately determined.

A right-angle bracket V and a standard W on the machine-base serve as bearings for a spindle X, provided with a driving-pulley X', and a head Y, provided with transverse peripheral blades, is made fast on one end of the spindle to constitute a cutter, the blades of which extend through a slot in a shield V', that constitutes part of said bracket, a cover Y' for the cutter-head being detachably connected to the shield. An arm V'' constitutes another part of bracket V, and a longitudinally-slotted plate Z is adjustably secured to the arm by set-screws Z' in the path of the templet M, above specified.

As shown in Figs. 1 and 2, a comb is positioned on carrier L, and the latter has had longitudinal movement a distance equal to one tooth of the feed-rack R, whereby an interstice between comb-teeth is brought in line with the cutter of the machine. By continued revolution of the eccentric F the carriage C and parts in connection therewith are moved in the direction necessary to feed the comb to said cutter. By contact with shield V' the clamped comb is depressed and carried tangentially to the cutter just within the periphery of same for the length of cut, the depth of this cut being equal to the exposure of said cutter through the shield-slot, whereby, owing to proper shaping of the cutter-blades, as best shown in Fig. 9, the otherwise right-angle corners of a pair of comb-teeth are accurately beveled. The length of cut in every instance is determined by the templet M, and when the latter comes in abutment against the stop-plate Z the superimposed guide-plate K and comb-carrier thereon will remain stationary, while plate J and carriage C continue to travel incidental to a completion of throw on the part of eccentric F aforesaid, the spring g being compressed when this operation takes place.

When the comb-carrying mechanism moves toward the cutter, the spring-controlled lever S has automatic movement to bring the fast dog x into engagement with the feed-rack R and the slip-dog y clear of said rack. At the same time there is contraction of the previously-expanded spring y' to move the slip-dog a distance equal to one tooth of the feed-rack. Now upon reverse movement of the comb-carrying mechanism the lever S is caused to tilt on its fulcrum (against spring resistance) by contact with lug z on the machine-base, whereby the fast dog x is moved out of engagement with the feed-rack and the slip-dog y brought into engagement with the same, thus permitting partial descent of weight T to move the comb-carrier a distance equal to one tooth of said feed-rack, the spacing of the latter being similar to that of the comb-teeth.

To compensate for lost motion and accurately center the comb with respect to the cutter, we provide a spring-detent K', made fast to a lug on the superimposed guide-plate K to come in the path of the comb-teeth.

While we have shown and described one form of a machine for our purpose, its organization may be somewhat varied without departure from our invention.

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

1. A comb-tooth-beveling machine comprising a cutter consisting of a head having transverse peripheral blades, a comb-carrier, feed-regulating mechanism in conjunction with the carrier, means for causing operation of the cutter on and between teeth of a comb upon said carrier, the comb being tangential to said cutter just within the periphery thereof the whole length of each cut, and templet and stop mechanism for regulating the length of cuts.

2. A comb-tooth-beveling machine comprising a cutter consisting of a head having transverse peripheral blades, a comb-carrier, feed-regulating mechanism in conjunction with the carrier, a spacing-rack for teeth of a comb upon said carrier, means for causing operation of the cutter on and between teeth of the comb, the latter being tangential to said cutter just within the periphery thereof the whole length of each cut, and a templet and stop mechanism for regulating the length of cuts.

3. A comb-tooth-beveling machine comprising a slotted shield, a cutter consisting of a head having transverse peripheral blades exposed through the shield-slot, a pivotal spring-controlled support, a comb-carrier having regulated feed connection with the support, and means for causing operation of the cutter on and between teeth of a comb upon said carrier, the comb being tangential to said cutter just within the periphery thereof the whole length of each cut, said comb being for a time opposed to the shield, and a templet and stop mechanism for regulating length of cuts.

4. A comb-tooth-beveling machine comprising a slotted shield, a cutter consisting of a head having transverse peripheral blades exposed through the shield-slot, a pivotally-adjustable spring-controlled support, a comb-carrier having regulated feed connection with the support, means for causing operation of

the cutter on and between teeth of a comb upon the carrier, the comb being tangential to said cutter just within the periphery thereof the whole length of each cut, said comb being for a time opposed to the shield, and a templet and stop mechanism for regulating length of cuts.

5. A comb-tooth-beveling machine comprising a cutter consisting of a head having transverse peripheral teeth, a comb-carrier, feed-regulating mechanism in conjunction with the carrier, a spring-detent engageable with a comb on the carrier, means for causing operation of the cutter on and between teeth of the comb, the latter being tangential to said cutter just within the periphery thereof the whole length of each cut, and a templet and stop mechanism for regulating length of cuts.

6. A comb-tooth-beveling machine comprising a slotted shield, a rotary cutter consisting of a head having transverse peripheral blades exposed through the shield-slot, a reciprocative carriage a spring-controlled plate in pivotally-adjustable connection with the carriage, a superimposed plate having spring-controlled slip connection with the plate aforesaid, a comb-carrier in intermittent feed connection with the superimposed plate at right angles to said carriage, a templet in connection with the comb-carrier, and a stop in opposition to the templet, the relative arrangement of the cutter and carriage being such that a comb upon the carrier is moved tangentially past and just within the periphery of said cutter the whole length of each cut.

7. A comb-tooth-beveling machine comprising a slotted shield, a rotary cutter consisting of a head having transverse peripheral blades exposed through the shield-slot, a reciprocative carriage, a spring-controlled plate in pivotally-adjustable connection with the carriage, a superimposed plate having spring-controlled slip connection with the plate aforesaid, a comb-carrier in intermittent feed connection with the superimposed plate at right angles to said carriage, a templet in connection with the comb-carrier, a stop in opposition to the templet, and a spacing-rack for teeth of a comb on said carrier, the relative arrangement of the cutter and carriage being such that the comb is moved tangentially past and just within the periphery of the cutter the whole length of each cut.

In testimony that we claim the foregoing we have hereunto set our hands, at Two Rivers, in the county of Manitowoc and State of Wisconsin, in the presence of two witnesses.

JOSEPH KOENIG.
NICHOLAS DEDRICK.

Witnesses:
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P. N. KORNELY.