No. 711,708. Patented Oct. 21, 1902.

C. M. PALMER.

ANIMAL SHEARING MACHINE.

(Application filed Sept. 23, 1901.)

(No Model.)

Fig 1.

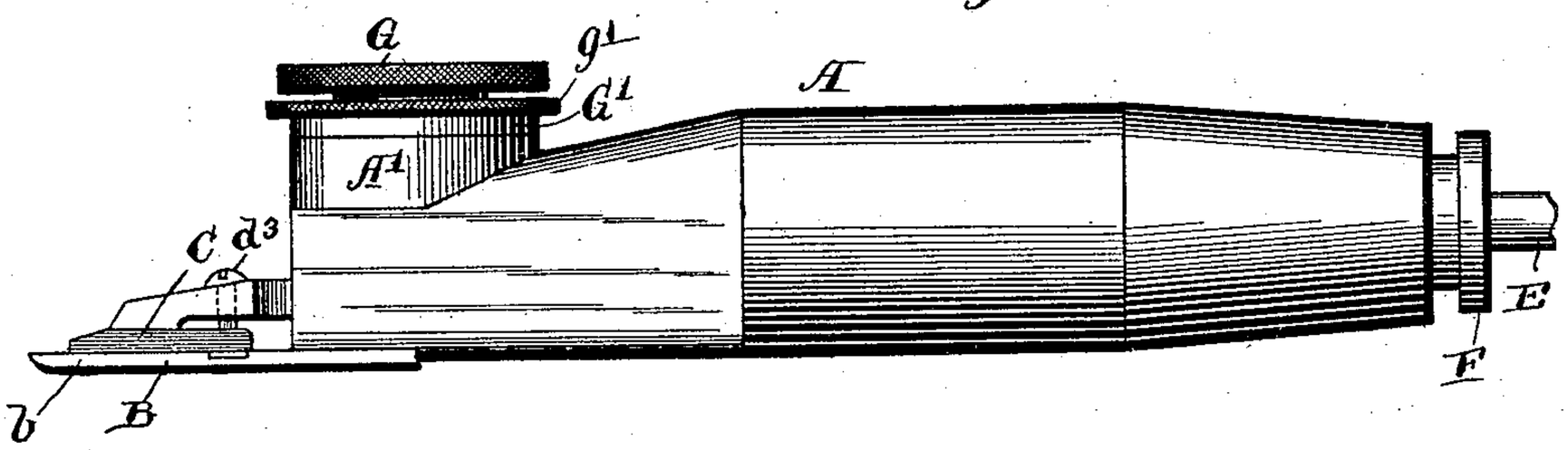


Fig 2.

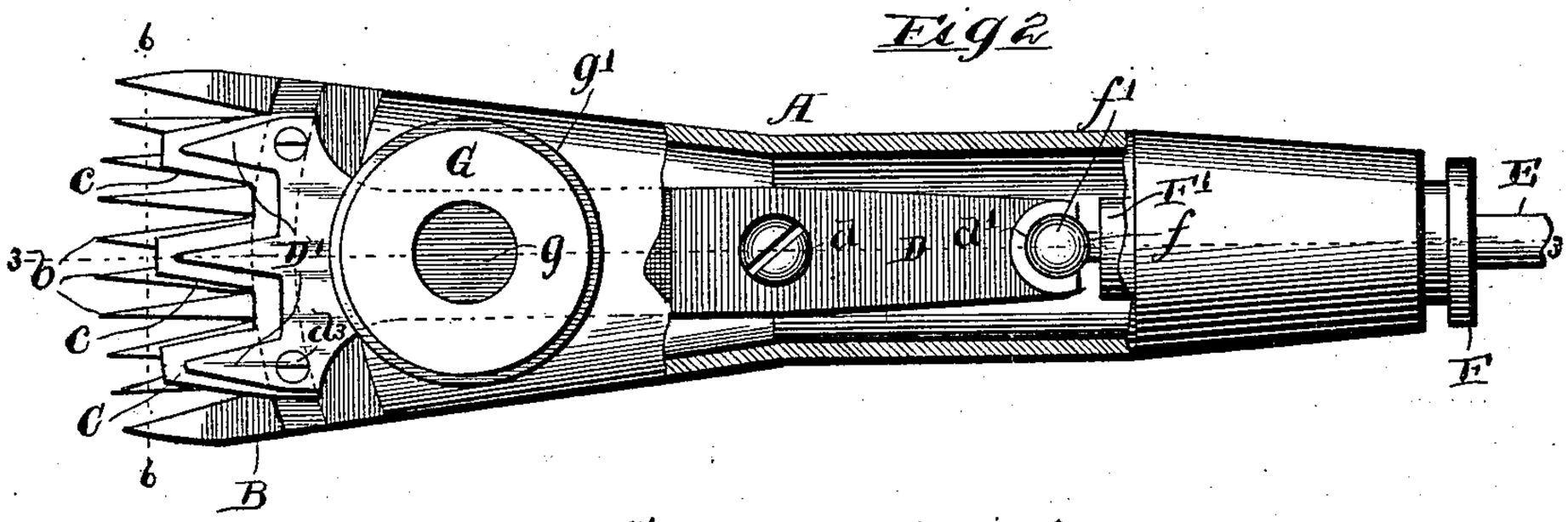


Fig 3.

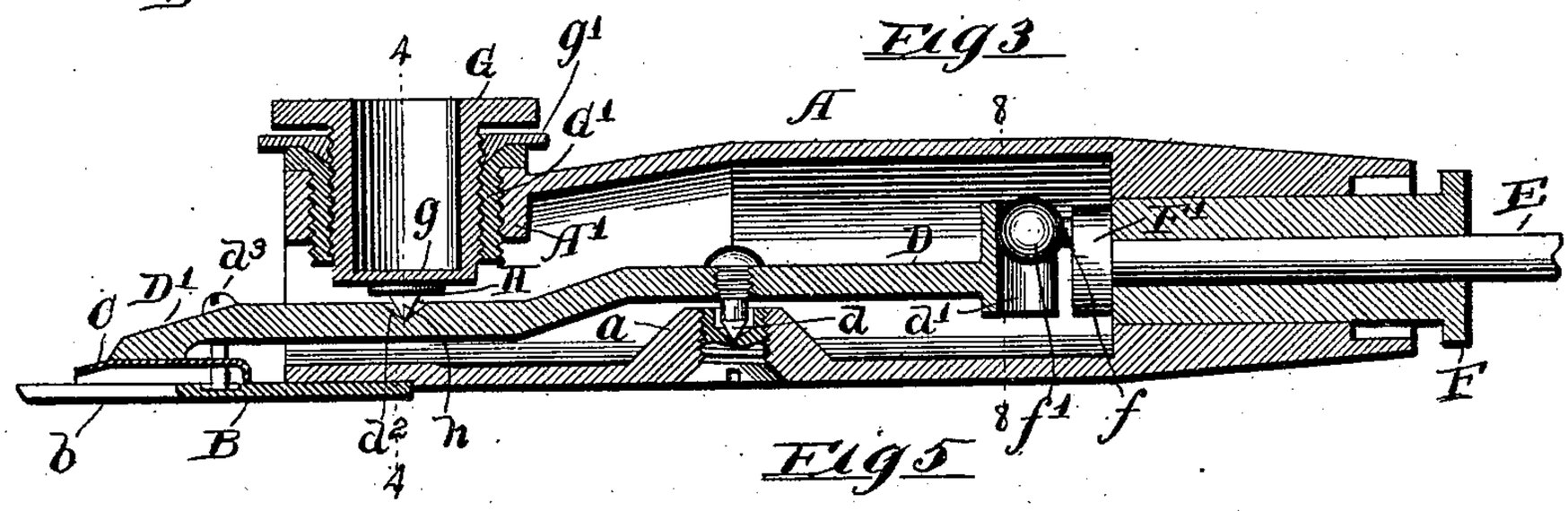


Fig 4.

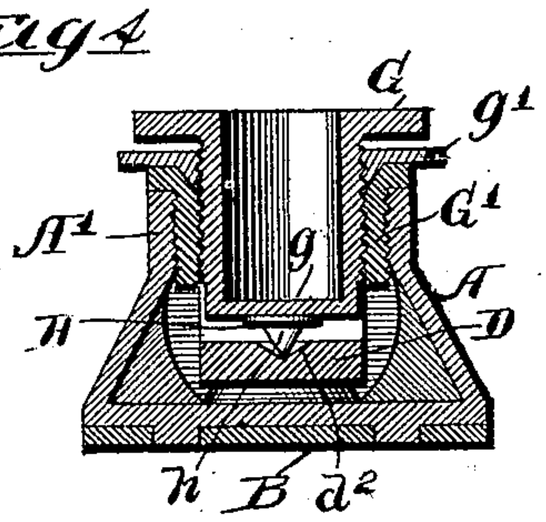


Fig 5.

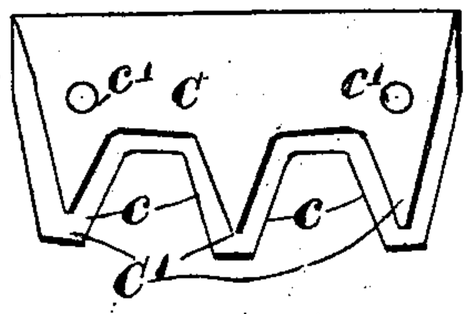


Fig 6.

Fig 7.

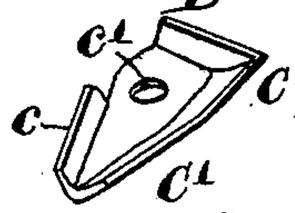
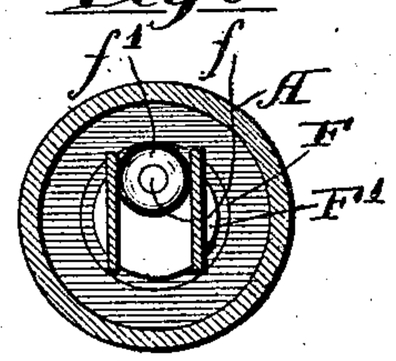


Fig 8.



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UNITED STATES PATENT OFFICE.

CHESTER M. PALMER, OF FOND DU LAC, WISCONSIN.

ANIMAL-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,708, dated October 21, 1902.

Application filed September 23, 1901. Serial No. 76,293. (No model.)

To all whom it may concern:

Be it known that I, CHESTER M. PALMER, a citizen of the United States, and a resident of Fond du Lac city, county of Fond du Lac, and State of Wisconsin, have made new and useful Improvements in Animal-Shearing Machines, of which the following is a specification.

This invention relates to improvements in animal-shearing machines of that class embracing a frame provided at its forward end with guard-fingers and with a cutter movable on and coöperating with said guard-fingers in a manner to produce a shearing action between the same.

Among the objects of the invention is to provide an improved cutter whereby a proper shear pitch of the teeth of the cutter to the fixed guard-fingers throughout the cutting length of the teeth is maintained, and, further, to improve the tension device whereby the cutter is held in proper coacting relation with respect to the guard-fingers.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a shearing-machine embodying the improvements constituting my invention. Fig. 2 is a plan view of the same with parts of the casing broken away to show the actuating mechanism. Fig. 3 is a longitudinal vertical section taken on line 3 3 of Fig. 2. Fig. 4 is a transverse section taken on line 4 4 of Fig. 3. Fig. 5 is a detail plan view of the cutter removed from the machine. Fig. 6 is a transverse section of said cutter, taken on line 6 6 of Fig. 2. Fig. 7 is a perspective view of the under side of one of the teeth of the cutter. Fig. 8 is a transverse vertical section taken on line 8 8 of Fig. 3.

As shown in said drawings, A designates a hollow cast-metal casing, which incloses parts of the mechanism of the device and is constructed to form a handle by which the device may be manipulated. The lower wall of said casing is flat at its front end, and to said front end of said lower wall is attached a guard-plate B, having forwardly-extending horizontally-disposed guard-fingers *b*.

C designates a horizontally-movable cutter, which rests upon the upper surface of the guard-plate and the fingers and coöperates with said fingers to produce the shearing or cutting action. Said cutter is herein shown as provided with three forwardly-projecting teeth C′, each formed to provide at its side margins two cutting edges or blades *c;* but the number of teeth may be varied as desired.

D designates an oscillatory actuating-lever, which is contained within the casing and is pivoted between its ends upon a conical-pointed bearing-screw *d*, which latter is seated in a cup-shaped or step bearing *a*, affixed in the bottom wall of the casing. As herein shown, said bearing is formed in the upper end of a screw which extends upwardly through the bottom wall of the said casing. The forward end of the actuating-lever D is provided with three forwardly-extending prongs D′, which are located over and bear downwardly against the teeth C′ of the cutter, as shown in Fig. 2, whereby the cutting edges of said cutter are maintained in proper contact with said guard-fingers. In order to establish a positive connection between said actuating-lever and the cutter, said lever is provided near the bases of said arms D′ with downwardly-projecting pins or studs d^3, which enter suitable apertures *c′* in the body of the cutter. The said actuating-lever is given oscillatory movement through the medium of a rotative shaft E, which is journaled in a bushing F, secured in a suitable opening in the rear end of the casing, and is provided at its front end with a crank-disk F′, having a crank-pin *f*, on which is mounted an antifriction-ball *f′*, which engages a parti-cylindric vertical socket or recess *d′* in the rear end of said lever. A suitable tension device is provided for maintaining proper pressure of the cutter on the guard-fingers, so as to insure the desired cutting action of said cutter.

The tension device herein shown embodies one feature of my present invention and is made as follows: G designates a tension-screw, shown as made hollow, which fits within and has screw-threaded engagement with a bushing G′, seated within and having screw-threaded engagement with a short tubular socket A′ in the forward end of the upper wall of the casing A, said parts being located a distance in rear of the cutter. The lower face *g* of

said tension-screw is parallel with the upper face of the guard-plate B. H designates a horizontal friction-plate, which is loosely interposed between the bottom of said tension-screw and the actuating-lever D and bears against the lower face of the tension-screw G. Said plate is provided with a conical-pointed supporting-stud *h*, which enters a like-shaped upwardly-opening notch or recess d^2 in the upper face of said actuating-lever D. The screw G is provided with an inwardly-facing lock nut or ring *g'*, adapted to bear against the upper face of the bushing G', by which the screw may be locked in an adjusted position. With this construction the friction bearing-plate H is free to adjust itself to the bearing-surface *g* of the tension-screw notwithstanding slight irregularities in the movement of the actuating-lever D which may be occasioned by unequal wear of the bearing parts thereof. Manifestly if the tension-screw be made to bear directly against the upper face of the lever D and the action of the lever D becomes irregular the tension-screw would not bear against the friction-lever on all parts alike, thereby producing unequal pressure on the cutter C. With my device, on the other hand, when such derangement of adjustment occurs in the lever D the plate H, by reason of the construction of the supporting-stud *h* thereof, is free to adjust itself to the lever so as to maintain said bearing-plate parallel with the lower surface of the tension-screw.

The teeth of the cutter are specially constructed with a view to give flexibility to the margins or blades *c* thereof throughout their cutting length, and thereby maintain the proper shearing pitch between said teeth and the guard-fingers. The said cutter is constructed of thin sheet-steel, and the teeth C are made hollow or concave on their under sides, as indicated in Fig. 6, while the upper sides of said teeth are made generally convex, so that the side margins or blades of the teeth on either side thereof incline downwardly and outwardly from the center to the margins of the said teeth. Said blades or margins of said teeth are separated throughout their entire cutting length, as clearly shown in Fig. 7, so that the blades formed by the right-hand margins at the respective teeth are free to flex from one end thereof to the other independently of the blades formed by the left-hand margins of said teeth and are therefore free to adjust themselves accurately to the guard-fingers. The ends of said teeth are cut square, as herein shown, so that the front ends of the blades at their cutting edges are entirely unconnected and as free to flex as in any other part thereof. This construction is of considerable importance, as it provides a uniform shearing action for the blades throughout their cutting length and insures that the blades will have proper contact with the guard-fingers. In a construction of this character, where the forward ends of the teeth are made solid, such flexibility of the side margins or blades of the teeth would not be possible, as the blades while free to flex at their rear ends would be rigid at their front ends, and therefore the shearing action of the blades in different parts of their cutting length would be irregular. The exact cross-section of the blades herein shown is not material so long as the construction affords the desired flexibility in the blades and maintains the proper shearing relation of the blades to the guard-fingers.

The construction of the cutter-teeth, and the consequent flexibility of the blades, enables the effective cutting width of the machine to be increased over prior machines for this purpose, for the reason that the action of the tension device thereon is more sensitive than if the blades possess less flexibility. Moreover, by reason of the fact that the blades of the teeth accommodate themselves readily to the guard-fingers it is not essential that the tension device be so accurately adjusted as in prior machines of this character.

I claim as my invention—

1. In an animal-shearing machine, the combination with guard-fingers, of a cutter movable on said guard-fingers, said cutter being provided on its opposite margins with cutting-blades, inclined to the plane of the guard-fingers, each of said blades being free to flex throughout its cutting length independently of the others.

2. In an animal-shearing machine, the combination with guard-fingers, of a cutter movable on said guard-fingers, the teeth of said cutter being provided on opposite margins thereof with cutting-blades inclined to the plane of the guard-fingers, and each of said blades being free to flex throughout its cutting length independently of the others.

3. In a shearing-machine, the combination with the guard-fingers, of a cutter having teeth concavo-convex in cross-section and each of substantially an even thinness from one to the other side margin, said margins of the teeth constituting the blades, which are unconnected at the point ends of the teeth.

4. In an animal-shearing machine, the combination with the guard-fingers, of a cutter movable on said guard-fingers, the teeth of said cutter being hollowed on their inner sides to the extreme outer ends thereof, and the opposite margins of said teeth constituting separate cutting-blades, each free to flex independently of the others.

5. A cutter for animal-shearing machines, having a plurality of teeth, the margins of which are inclined downwardly and outwardly from the longitudinal center of the teeth, to constitute cutting-blades, said blades being disconnected at their outer ends and free to flex throughout their cutting length.

6. A cutter for animal-shearing machines, having plurality of teeth, said teeth being hollowed on their inner sides to the outer ends thereof, and being abrupt or pointless

at their outer ends, whereby the said margins of the teeth, constituting the cutting-blades, are unconnected at said outer ends.

7. In a shearing-machine, the combination with a casing, guard-fingers at the front end thereof, a cutter movable on said guard-fingers, and a vibratory operating-lever, connected with and pressing said cutter upon the guard-fingers, of a tension device embracing a friction-plate, interposed between said operating-lever and an opposing part of the casing, said friction-plate having oscillatory movement with respect to the parts on which it is supported.

8. In an animal-shearing machine, the combination with a casing, guard-fingers at the front end thereof, a cutter movable on said guard-fingers and an oscillatory actuating-lever connected with and pressing said cutter against said guard-fingers, of a tension device embracing a screw extending through said casing and provided with an inwardly-facing bearing-surface and a friction-plate on the lever coacting with the friction-surface of the screw, said friction-plate having oscillatory movement with respect to the lever.

9. In an animal-shearing machine, the combination with a casing, guard-fingers at the front end thereof, a cutter movable on said guard-fingers and an oscillatory actuating-lever connected with and pressing said cutter against said guard-fingers, of a tension device embracing a screw extending through said casing and provided with an inwardly-facing bearing-surface, and a friction-plate on the lever coacting with the friction-surface of the screw, said plate being provided with a stud which fits loosely in a recess in the adjacent face of the lever.

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