No. 622,332.

Patented Apr. 4, 1899.

R. D. DIXON.

ANIMAL SHEARS.

(Application filed Jan. 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.

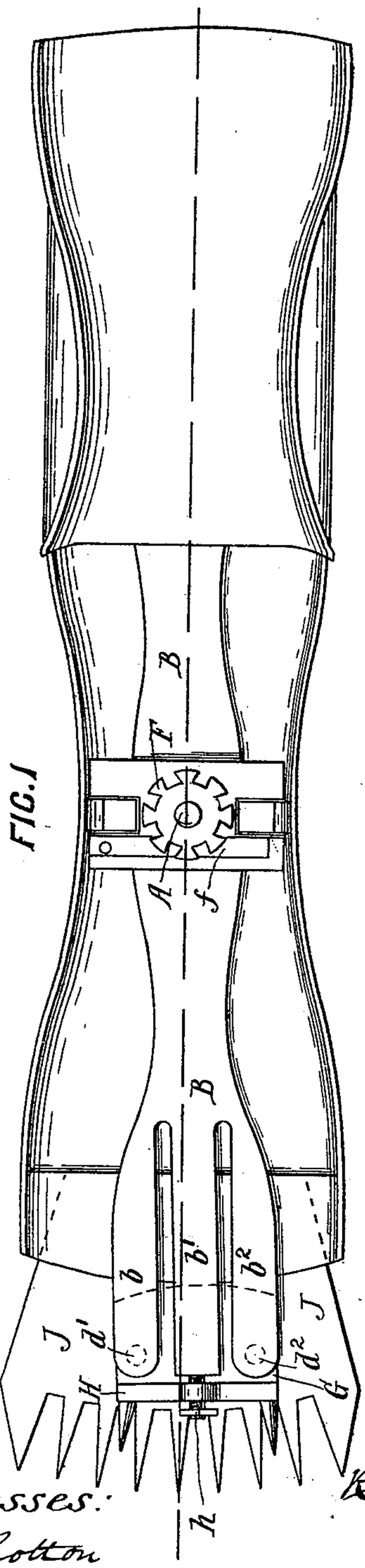


FIG. 1

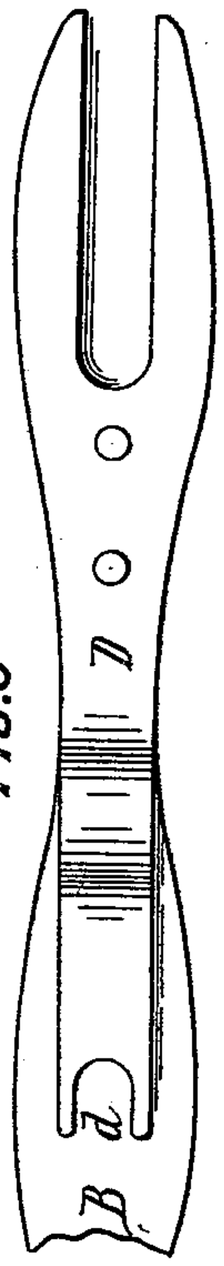


FIG. 3

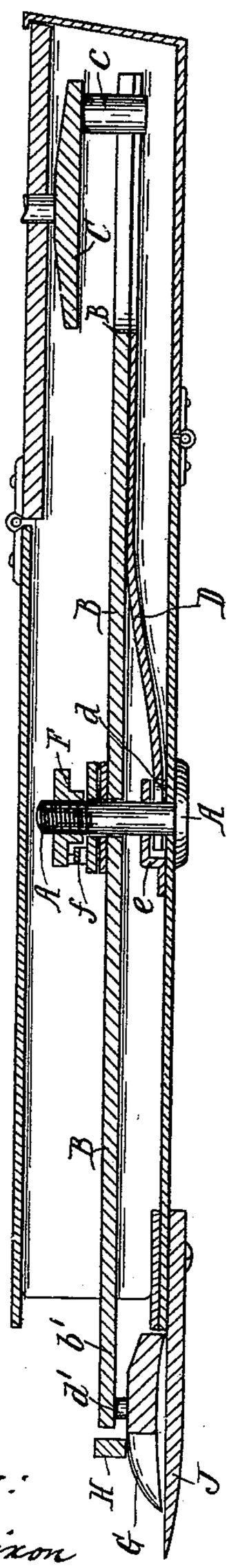


FIG. 2

Witnesses:
E. R. Bolton
Albert G. Davis

Inventor:
Robert Dangar Dixon
By Richards & R
his Attorneys.

No. 622,332. Patented Apr. 4, 1899.

R. D. DIXON.

ANIMAL SHEARS.

(Application filed Jan. 7, 1899.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 5

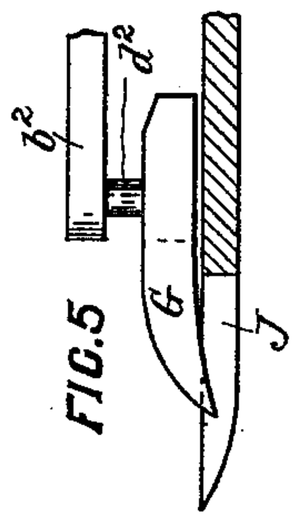


FIG. 6

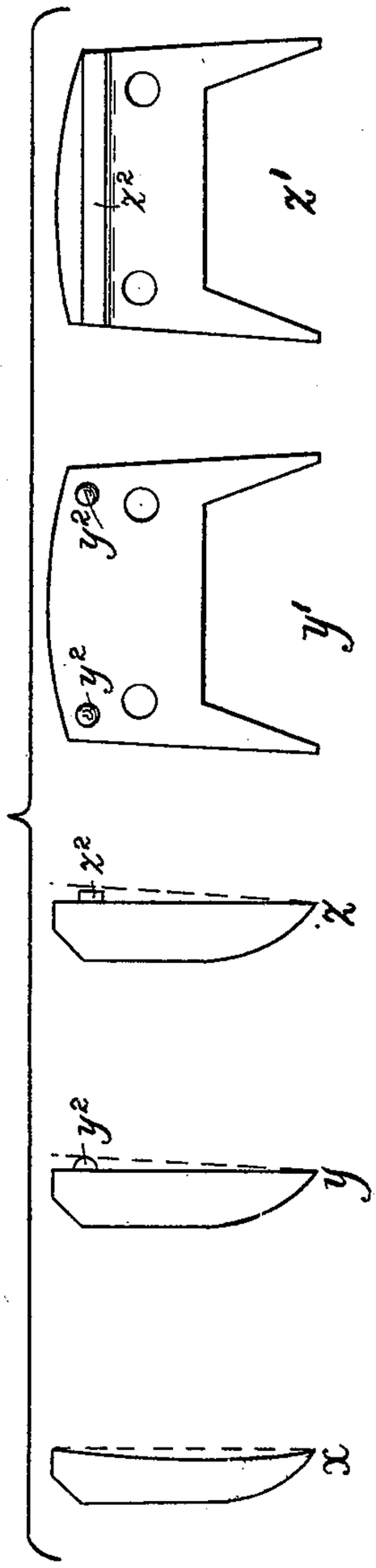
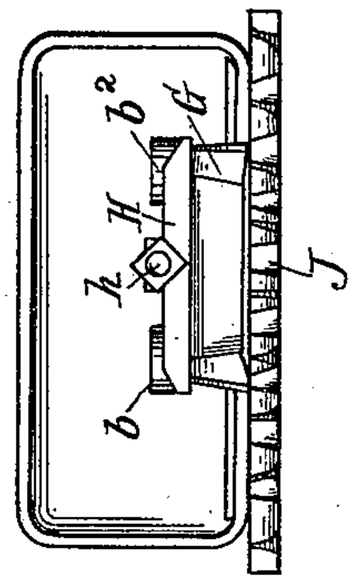


FIG. 4



Witnesses:

E. B. Bolton

Inventor:

Robert Dangar Dixon.

By Richards & R

his Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT DANGAR DIXON, OF SYDNEY, NEW SOUTH WALES.

ANIMAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 622,332, dated April 4, 1899.

Application filed January 7, 1899. Serial No. 701,438. (No model.)

To all whom it may concern:

Be it known that I, ROBERT DANGAR DIXON, a subject of the Queen of Great Britain and Ireland, and a resident of Sydney, in the county of Cumberland and Colony of New South Wales, have invented a certain new and useful Animal-Shears, of which the following is a specification.

Hitherto, owing to the way in which the combs and cutters of machine sheep-shears have been made and ground, the cut that they effect has not been a true cut, but has been merely a breaking of the fiber by percussion. In order that the percussive action of the cutter upon the fiber may be effective, it has been found necessary to drive the machines at a very high rate of speed, and this, together with the excessive tension that is required to be applied to the cutter, necessitates a much higher degree of power to drive the machines than should be necessary were the cut a true cut.

This invention has been specially devised with a view to obtain a true cut of the fiber by causing the cutting edges of the cutter to work along the cutting edges of the comb in the same way as the two cutting edges of a pair of scissors or a pair of hand-shears work together.

In the accompanying drawings, Figure 1 is a plan of the sheep-shears, the cover being laid open. Fig. 2 is a longitudinal vertical section of the same, taken through the central longitudinal axis of the machine. Fig. 3 is an underneath plan of part of the main actuating-lever and the tension-spring. Fig. 4 is a front elevation of the comb and cutter, showing the tension-bar. Fig. 5 is a section through the comb, showing the action of the cutter with the comb. Fig. 6 shows several alternative modes of making the cutter whereby the scissors cut may be effected.

A is the central axial pin, which also serves as a tension-screw.

B is the main actuating-lever, which is forked at its rear end to receive the antifriction-roller *c* of the driving-disk C, which is caused to rotate by any suitable means. Below the lever B is riveted the tension-spring D, the forward end of which is forked, as at *d*, so as to allow of the passage of the axial pin A. The forked part *d* of the spring D is inserted into a step-socket *e*, which is bored to permit of the passage of the pin A, the upper end of which is threaded to receive the tension-nut F, which when it is screwed down tight will be retained in that position through the instrumentality of a stop upon the spring *f*, which will engage with one of the peripheral notches in the nut F in a manner well known and understood. The forward end of the lever B is shaped like a fork, with three prongs *b b'* b^2, the two outside prongs *b* b^2 being provided underneath with studs d' d^2, which engage with corresponding recesses in the cutter G. It is by means of the studs d' d^2 that the reciprocatory movement of the lever B is communicated to the cutter G. The cutter G is of the two-pronged type, as may be seen by referring to Figs. 1, 4, and 6. Bearing down upon the cutter G is the tension-bar H, which is pivoted to the central prong *b'* by the screw *h*. By means of this tension-bar H the tension is evenly distributed upon the two teeth of the cutter. The comb J is preferably ground perfectly flat on its upper side, but it may be made curvilinear or flat saucer-shaped for reasons to be hereinafter explained. The under side of the cutter G is hollow-ground, as shown in Fig. 5 and by the figure *x* of Fig. 6. The curve has been exaggerated in the drawings to render it more apparent. By grinding the cutter hollow the result will be that the points of its teeth will drop into the spaces between the teeth of the comb, and the cutting edges of the cutter-teeth will grind against the cutting edges of the comb-teeth, thus producing a true cut or shear on anything that is placed between. The effect is precisely similar to the shearing effect produced by the two blades of a pair of scissors or shears while they are in process of being closed together.

Instead of hollow-grinding the cutter, as shown at *x*, Fig. 6, a very similar effect may be produced by slightly raising the heel of the cutter upon studs y^2, Fig. 6, *y y'*, or upon a thin strip of metal z^2, Fig. 6, *z z'*, or the cutter may be flat-ground and the comb hollow or saucer ground on its upper surface. Either of these methods would produce the same effect—viz., that of depressing the points of the teeth of the cutter into the spaces between the teeth of the comb—resulting in a shear-

ing action between the cutting edges of the teeth of the cutter and the comb; but the shearing action would not eventuate if the teeth of the comb were made parallel to one another, as is generally the case. I have therefore found it necessary to construct the teeth of the comb and of the cutter on lines radiating from the center of the axial pin A. When the cutter reciprocates to and fro, it will always be parallel with the comb, and the shear or cut will always be the same no matter at what part of the comb the cut takes place.

Owing to the dip of the points of the teeth of the cutter into the spaces between the teeth of the comb the traverse of the cutter would necessarily be somewhat undulatory, which but for the special devices employed could not fail to materially affect the efficiency of the tension. Referring to Fig. 2, it will be seen that the spring D would have a tendency to elevate the rear end of the lever B, and thereby to depress the forks b b' b^2 at the forward end of the same, and if the cutter were rigidly secured to the forks the tension could not be evenly distributed over the cutter. This objection is obviated by the tension-bar H, which is articulated to the central fork b' by the screw h, so as to be susceptible of movement only in a plane at right angles to the plane of movement of the lever, and therefore, no matter what may be the position of the lever B, the tension will always be evenly distributed over the cutter.

It is obvious that the principle of the hollow-ground cutter may be applied with equal facility to horse-clippers and other appliances of an analogous type.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination, in animal-shears, a comb having teeth and a cutter having teeth which dip between the teeth of the comb, substantially as described.

2. In combination in animal-shears, the comb having teeth, and a cutter having a concaved under side with its teeth dipping between the teeth of the comb, substantially as described.

3. In combination, the comb, a cutter and a pivoted lever carrying the same, the said cutter and comb having their teeth radiating from the pivotal point of the lever and the teeth of the cutter dipping in between those of the comb, substantially as described.

4. In combination, the comb, the cutter having the teeth, a lever for operating the cutter and a tension-bar pivoted to the central part of the forward edge of the lever to move in a plane at right angles to the plane of movement of the cutter-lever, the ends of the tension-bar bearing upon the outer portions of the cutter, substantially as described.

5. In combination, the comb, the cutter, the lever for operating it connected thereto, the axial pin about which the lever turns, the tension-spring connected to the lever at its rear end and forked at its front end to embrace the axial pin, the stepped socket e inclosing the forked end of the lever, and the tension-bar at the front of the lever bearing on the cutter, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ROBT. DANGAR DIXON.

Witnesses:

MANFIELD NEWTON,

JAS. T. HUNTER.