

(Model.)

2 Sheets—Sheet 1.

W. BELL, J. W. BROOMHEAD & W. A. JONES.
ANIMAL SHEARS.

No. 518,204.

Patented Apr. 10, 1894.

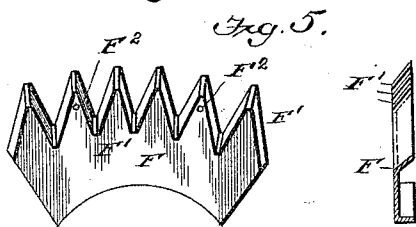
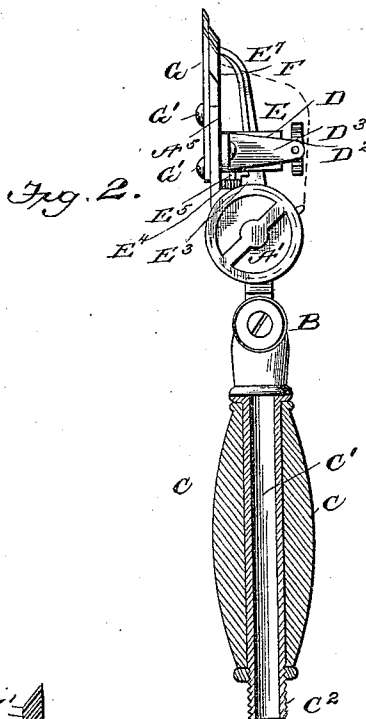
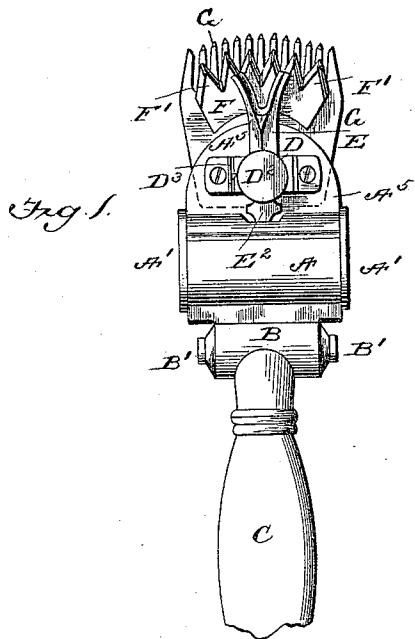


Fig. 3.

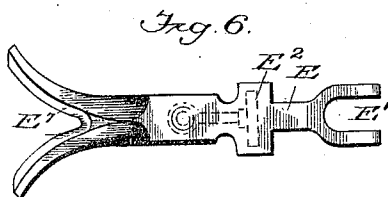
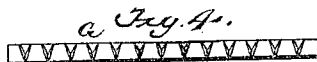
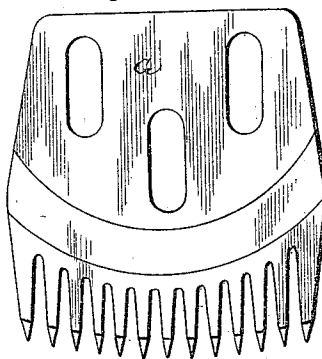


Fig. 6.

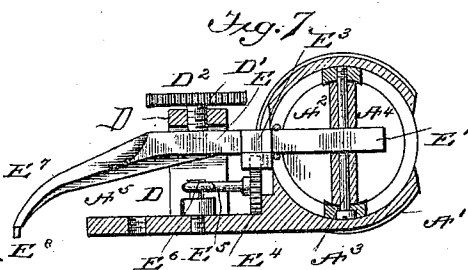


Fig. 7.

Fig. 8. Inventors
Wm Bell
John W Broomhead
Walter A. Jones
by Richard H. Co. Attorneys.

Witnesses
John H. Jones
Walter A. Jones

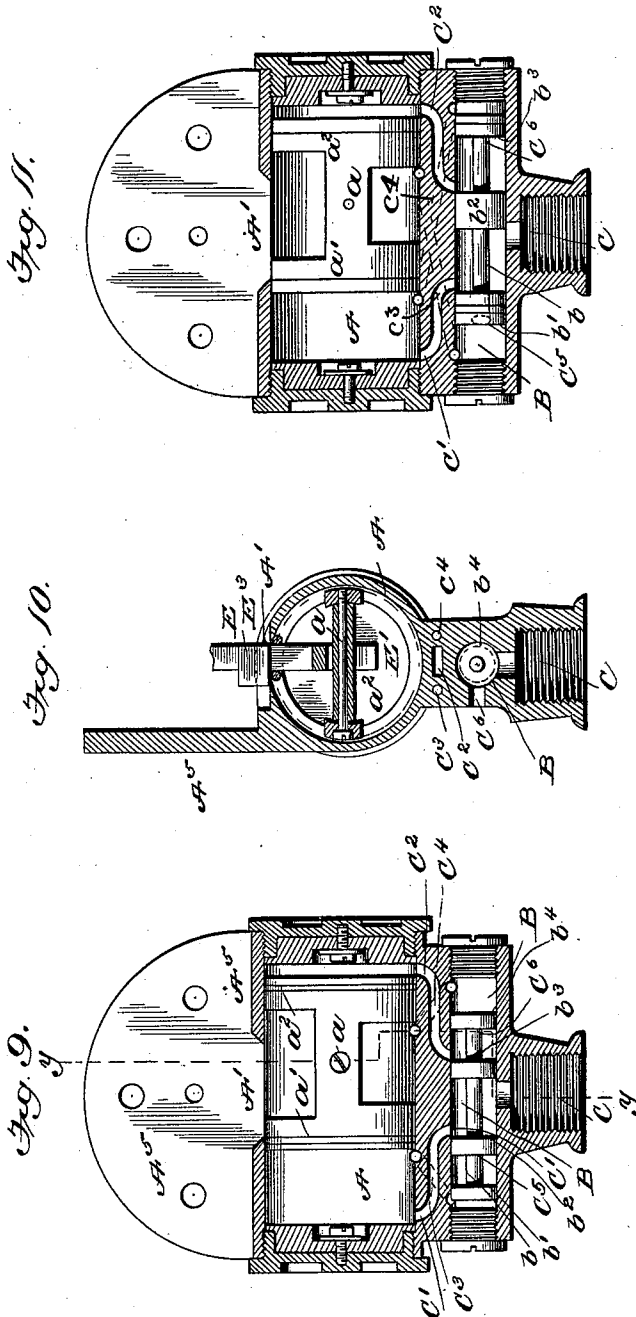
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2 Sheets—Sheet 2.

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Witnesses

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Walter Augustus Jones

Inventors

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UNITED STATES PATENT OFFICE.

WILLIAM BELL, OF MURRURUNDI, AND JOHN W. BROOMHEAD AND WALTER A. JONES, OF SYDNEY, NEW SOUTH WALES.

ANIMAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 518,204, dated April 10, 1894.

Application filed June 25, 1887. Serial No. 242,473. (Model.) Patented in Victoria April 23 1887, No. 5,032; in South Australia April 26, 1887, No. 796; in Tasmania April 28, 1887, No. 460; in New Zealand May 9, 1887, No. 2,332; in New South Wales July 30, 1887, No. 2,135, and in Queensland August 5, 1887, No. 262.

To all whom it may concern:

Be it known that we, WILLIAM BELL, engineer, residing at Murrurundi, and JOHN WILLIAM BROOMHEAD and WALTER AUGUSTUS JONES, mathematical instrument makers, residing at Sydney, in the British Colony of New South Wales, subjects of the Queen of Great Britain, have invented new and useful Improvements in Appliances for Shearing or Clipping Animals and for Cutting Hair, (for which we have obtained patents in New South Wales July 30, 1887, No. 2,135; in Victoria April 23, 1887, No. 5,032; in Queensland August 5, 1887, No. 262; in South Australia April 26, 1887, No. 796; in Tasmania April 28, 1887, No. 460, and in New Zealand May 9, 1887, No. 2,332,) of which the following is a specification.

This invention relates to appliances for shearing or clipping animals and for cutting hair in which a fingered knife bar or cutting plate is reciprocated in contact with a comb plate or finger bar in order to clip or shear the wool or hair and it has been specially devised in order to minimize the power required to be expended by the operator in working and guiding such appliances. By it power is provided to impart the reciprocating motion to the knife bar or cutting plate and thus leaving nothing for the operator to do but to guide the implement which guiding is in no way or in very little way interfered with by the construction of the machine.

The special features of improvement in which our invention consists will be pointed out particularly hereinafter in the claims. But in order that our invention may be clearly understood reference will now be made to the accompanying drawings showing various constructions of appliances for shearing or clipping animals and for cutting hair according to our improvements.

Figures 1 and 2 are plan and side views respectively of a sheep shearing machine with its dust cover removed. Figs. 3 and 4 are plan and front views of the comb or finger bar. Fig. 5 is a plan and an edge view of the cutter or knife bar. Fig. 6 is a plan of the connecting lever. Fig. 7 is a partial section through the center of the cylinder showing

also side view of the connecting lever in position. Fig. 8 is a front view of the friction roller. In these figures the details are shown about full size while Figs. 1 and 2 are about half size. Fig. 9 is a section of a cylinder and four flanged valve and Fig. 10 is a cross section of same on line *yy* in Fig. 9. Fig. 11 is a sectional view of a cylinder having a three flange valve.

Referring to Figs. 1 to 8, A is the cylinder, B the valve chest, C the hollow handle, D the bridge, E the connecting lever, F the cutter or knife bar, G the comb or finger bar. A' A' are cylinder covers, A² piston, A³ central cross pin, A⁴ thimble, A⁵ front flange or frame plate. B' are valve chest covers, C' supply pipe, C² screwed end. D' is screwed center pin, D² milled head, D³ spring pawl. E' is fork, E² bearing piece having flanges E³. E⁴ is friction roller, E⁵ radius rod, E⁶ fixed center. E⁷ are bifurcated ends, E⁸ pintles. F' are teeth, F² pin-holes. G' are fastening screws. To the screwed end C² is attached a flexible pipe from the reservoir of motive power and preferably with a universal joint as an intermediary.

In operation the motive power, preferably compressed air is supplied to the valve chest B through handle C and the valve (as herein after described) causes the piston to reciprocate from end to end of the cylinder. The fork E' taking around thimble A⁴, is thus moved to and fro around central screw D' and gives a reciprocating motion to the ends E⁷ which having their pintles E⁸ in pin holes F², move the cutter or knife bar F to and fro over the comb plate or finger bar G giving a cutting or shearing motion to the teeth F' against the teeth or fingers of said plate G. The lever E has its bearings at the front end by the cutter F on the plate G and at the back by the bearing piece E² upon the roller E⁴ over frame A⁵. This roller E⁴ moves around center E⁶ to minimize friction. The stiffness of movement or friction of the lever E is regulated by turning milled head D² the spring pawl D³ retaining the head D² and the center D' in the position desired. The cutter F may be released for sharpening by unscrewing the center pin D' until pintles E⁸ are clear of their holes F². The cutter hav-

ing the reciprocating motion above the comb as described the operator grasps the handle C and guides the appliance over the animal and the wool or hair entering between the teeth of both cutter and comb is cut or sheared off.

Referring to Figs. 9 and 10, A is the cylinder, B the valve chest or cylinder and C the socket for the hollow handle. A' is the opening for the movement of the connecting lever, a is pin or thimble across the open space of the piston and a' and a² are piston ends, B' is valve stem, b' b² b³ b⁴ are valve pistons, c is main supply entrance, c' and c² are supply and exhaust ports of cylinder and c³ and c⁴ are supply ports (shown by dotted lines) from cylinder to valve c⁵ and c⁶ are exhaust ports (through valve cylinder). It is preferred that packing rings be fitted in the main and valve pistons and also that elastic packing or buffers be fixed in the ends of the main cylinder.

Starting with the pistons in the positions shown in the figures the mode of operation is as follows:—Compressed air is entering through opening c valve chest B and port c' into the cylinder behind piston end a' and the contents of the other end of cylinder are exhausting through port c² valve chest B and port c⁶ into the atmosphere. As shown the piston has just completed one stroke and has opened port c³ allowing the compressed air which has entered the cylinder to pass into the valve chest just behind piston b'; at this moment the valve being moved by the pressure behind piston b' to the other end of the valve chamber opens the cylinder behind piston a' through port c' valve chest B and port c⁵ to the atmosphere and also supplies power to the cylinder behind piston a² by opening port c² allowing the compressed air to enter across the valve chest and move the piston a' a² to the other end of the cylinder when passage c⁴ will allow the power to again reverse the valve (to that position shown on the drawings) and supply the power to again move the main piston a' a². Similar reciprocating movements will take place until the supply of power is discontinued and this movement is transmitted to the cutter or knife bar of the shears preferably by means of the forked lever hereinbefore described the fork of which takes around pin or thimble a.

Referring to Fig. 11, A is the cylinder, B the valve chest or cylinder and C the socket for the hollow handle. A' is the opening for the movement of the connecting lever—a is the pin or thimble across the open space of the piston—a' and a² are piston ends—b is valve stem—b' b² and b³ are valve pistons. c is main

supply entrance—c' and c² are supply and exhaust ports to main cylinder. c³ and c⁴ are supply ports (shown by dotted lines) from cylinder to valve—c⁵ and c⁶ are exhaust ports (through valve cylinder).

The operation will be easily understood for it will be seen that the main piston alternately opens ports c³ and c⁴ to reverse the position of the valve and by this means allows valve piston b' to alternately close and open port c' and close and open port c⁵ allows valve piston b³ to render the same service for ports c² and c⁶; and causes valve piston b² to alternately open ports c' and c² to the supply c all in proper order and as required to produce a reciprocating motion of the main piston a' a².

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim as improvements in appliances for shearing or clipping animals and for cutting hair is—

1. In combination, the comb plate, the reciprocating knife over the same, the lever carrying said knife, the cylinder and piston for operating the knife lever, the hollow handle, the fluid conduit extending longitudinally through the same, and the valve chest interposed between said handle and the piston cylinder, substantially as described.

2. In combination, the comb plate, the knife, the lever carrying the same, the bridge D extending over the lever, the adjustable pivot screw extending through the bridge and engaging the knife lever, the roller E⁵ upon which the lever bears, the swinging arm carrying said roller, and the means for operating the knife lever, substantially as described.

3. In combination, the comb plate, the knife resting thereon, the lever connected to said knife and consisting of the forked arms E⁷ detachably connected with the knife plate, the bridge extending over the knife lever, the lower bearing for the lever, the adjustable pivot screw passing through the bridge to engage the knife lever and force the same down so that it will engage the knife plate securely and force the same against the comb plate, substantially as described.

Dated at Sydney, in the Colony of New South Wales, this 26th day of April, 1887.

WILLIAM BELL.
J. W. BROOMHEAD.
W. A. JONES.

Witnesses:

FRED WALSH,
HENRY P. CHATER.