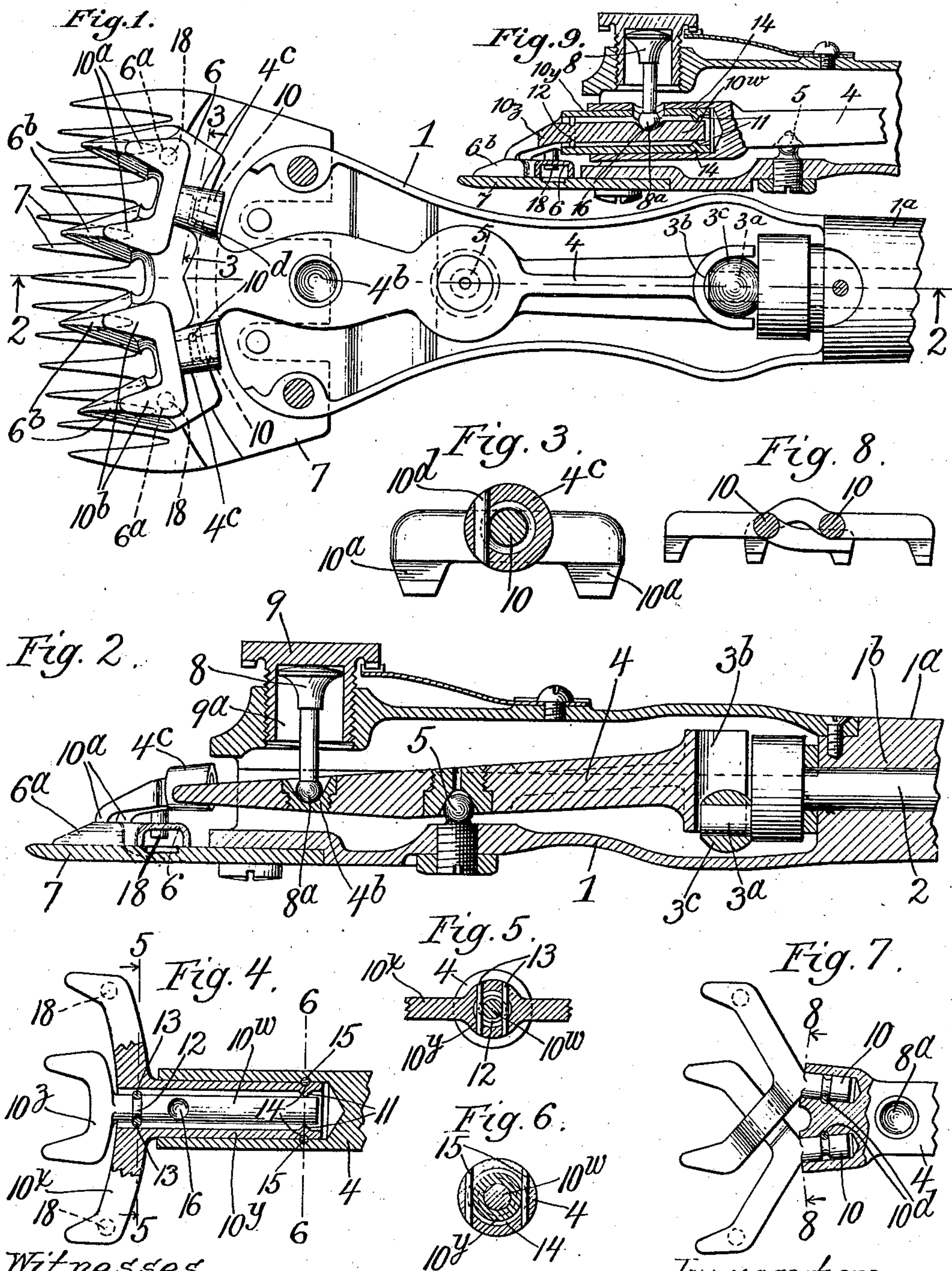


No. 860,159.

PATENTED JULY 16, 1907.

J. K. STEWART.  
ANIMAL SHEARS.

APPLICATION FILED NOV. 30, 1906.



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# UNITED STATES PATENT OFFICE.

JOHN K. STEWART, OF CHICAGO, ILLINOIS.

## ANIMAL-SHEARS.

No. 860,159.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed November 30, 1906. Serial No. 345,680.

*To all whom it may concern:*

Be it known that I, JOHN K. STEWART, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Animal-Shears, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to devices of the general class of animal shears which are hand-directed and adapted to be power-driven, and particularly to improvements in the class of shears especially adapted for sheep-shearing. It consists of the features of construction shown and described and set out in the claims.

In the drawings:—Figure 1 is a top plan view of a sheep-shearing machine embodying this invention, with the cap-plate removed. Fig. 2 is a section at the line 2—2 on Fig. 1 through the entire shear, with the cap-plate, pressure-pin and adjusting screw in place. Fig. 3 is a detail section at the line 3—3 on Fig. 1. Fig. 4 is a partly sectional plan view of a portion of the operating lever and pressure transmitting fingers of different form from that shown in the preceding figures, section being made in a horizontal plane axial in respect to the pressure fingers. Fig. 5 is a section at the line 5—5 on Fig. 4. Fig. 6 is a section at the line 6—6 on Fig. 4. Fig. 7 is a view similar to Fig. 4 showing another modification. Fig. 8 is a section at the line 8—8 on Fig. 7. Fig. 9 is a view similar to Fig. 2 of the modified form shown in Fig. 4.

The customary parts of a tool or machine of this class are shown in conventional or familiar form, comprising the housing or base, 1, including the handle-piece, 1<sup>a</sup>, inclosing the driving shaft, 2, said shaft having at its forward end a crank-plate, whose crank wrist or stud, 3<sup>a</sup>, engages a vertical slot, 3<sup>b</sup>, in the rear end of the cutter-operating lever, 4, which is fulcrumed intermediate its ends at the ball-and-socket joint, 5, permitting it free movement to a limited extent in all directions. The crank-wrist, 3<sup>a</sup>, has the customary anti-friction roll, 3<sup>c</sup>, for relieving the pressure of its engagement with the operating lever, 4.

7 is a comb or fixed cutter blade which is mounted rigidly upon the under side of the base or housing, 1, at the forward edge of the latter.

6 is a vibrating cutter, which is lodged upon the upper side of the comb or fixed cutter and provided with apertures, 6<sup>a</sup>, at which it is engaged by fingers of the operating arm hereinafter described. The vibrating cutter has four equally spaced shear teeth, 6<sup>b</sup>. It is necessary that all four of these teeth should be held with equal pressure upon the comb or fixed cutter, and it is not sufficient for this purpose that the vibrating cutter is itself rigid, because the spring of the cutting teeth of this cutter yielding separately and independently, would permit them to be individually crowded off from the fixed cutter if not individually held there-

on by means operative to so hold them to an extent independently of the other teeth. For this purpose the operating lever, 4, carries four pressure fingers bearing upon the four teeth, 6<sup>b</sup>, respectively. The necessary pressure is transmitted to the fingers through the operating lever by means of the pressure pin or dolly, 8, having its spherical terminal, 8<sup>a</sup>, at the lower end stepped in the socket, 4<sup>b</sup>, of the operating lever forward of the universal joint fulcrum of the latter. The operation of this pressure pin for transmitting pressure and permitting the oscillation of the cutter is familiar and need not be further described beyond indicating that its head or upper end is slightly curved and bears against the top of the socket, 9<sup>a</sup>, in the tension screw, 9, which is screwed down through the cap for applying and varying the pressure for holding the two cutters in contact. In order that the pressure transmitted thus from the foot of the dolly stepped in the operating lever may be distributed equally to the four fingers, the operating lever is fulcrumed, as described, so that it is free to rock slightly about a fore-and-aft axis through its said universally pivotal bearing and the pivotal step of the dolly pin upon it. If there were but two pressure fingers this rocking movement of the operating lever would suffice to transmit the pressure equally to such two fingers providing they were equally spaced at opposite sides of the axial line. When a third finger only is employed in the axial line this rocking movement is still sufficient to transmit the pressure when that finger itself is pivotally connected to the operating lever for vertical movement, as in many familiar forms of tools of this class; but when there are four pressure fingers it will be evident that if two of them, being either the extreme or the intermediate pair, are carried rigidly with the operating lever, the other two being upon a lever pivoted only for swinging vertically, the lateral oscillation or rocking of the operating lever will be defeated by the fact that such pivotal member carrying the two fingers has, by means of its two fingers, two points of bearing, and therefore cannot serve as a pivot for the oscillating or rocking movement by which the pressure would be equalized. In order, therefore, that the pressure of four fingers may be equalized, I form and arrange them in pairs, the two of each pair being rigid and integral with each other, the part having each pair thus formed being mounted pivotally on the operating lever with capacity for rocking about a fore-and-aft axis intermediate the two fingers which it carries.

In the form shown in Figs. 1, 2, 3 and 4, the fingers are made in two pairs, one comprising the two right-hand fingers, 10<sup>a</sup>, 10<sup>a</sup>, and the other the two left-hand fingers, 10<sup>b</sup>, 10<sup>b</sup>, each pair being rigid and projecting from a cross-head on a spindle or stem, 10, the two spindles, 10, being mounted for rocking in sleeves or bearings, 4<sup>c</sup>, 4<sup>c</sup>, situated at the end of the operating



lever, 4, symmetrically with respect to the fore-and-aft vertical plane through the fulcrum and point of application of pressure. By this construction, it will be seen that the operating lever is adapted to transmit equal pressure to the two spindles or stems, 10, 10, and from them pressure is transmitted equally to their two respective fingers, 10<sup>a</sup>, 10<sup>a</sup> and 10<sup>b</sup>, 10<sup>b</sup>, so that the entire pressure is distributed equally among all four of the fingers. For convenience, to retain the spindles, 10, in their sleeve bearings, 4<sup>c</sup>, while permitting them to rock in them the slight amount required, they are secured by means of a key-pin, 10<sup>d</sup>, set in at one side transversely to the axis of the spindle, 10, which is transversely grooved, the groove extending around the spindle a sufficient distance to allow it the necessary rocking movement. (Obviously, the groove may complete the circle of the spindle, if desired.)

In the form shown in Fig. 7, the construction is substantially similar to that already described, except that each pair of fingers consists of the extreme and one intermediate finger; and the cross-heads from which the two fingers of the two pairs respectively project are formed so that one may reach over the other as is necessary in view of the distribution of the fingers to the two cross-heads. In this construction it will be noticed that the bearings for the spindles, 10, are in line with the intermediate fingers respectively in order to be respectively intermediate between the two fingers of the respective pairs.

In the form shown in Figs. 4, 5 and 6, the fingers are distributed into two pairs, one of which comprises the extreme fingers and the other the intermediate fingers. The extreme fingers project from a longer cross-head, 10<sup>x</sup> having at its middle point a spindle or stem, 10<sup>y</sup>, and the intermediate fingers project from a shorter cross-head, 10<sup>z</sup>, having at its middle point a spindle, 10<sup>w</sup>. The spindle, 10<sup>y</sup>, is hollow, and the spindle, 10<sup>w</sup>, seats and is journaled in it, the larger spindle being in turn journaled in the forward end of the operating lever, 4, so that both spindles rock about a common pivotal axis. In this construction it is not necessary that the operating lever have any rocking movement of its own, since both pairs of fingers are adapted to rock about a fore-and-aft line through the pivot of, and the point of application of pressure to, the operating lever. This lever is, however, shown with the same form of fulcrum in these figures as in the others. In this form it is necessary to provide against either pair of fingers taking all the pressure to the exclusion of the other pair, and for this purpose the pressure is applied not directly to the operating lever, 4, but to the stem of one pair of fingers, being transmitted through that stem to the other pair,—an expedient which is analogous to a familiar construction employed when there are only three fingers. A convenient method of accomplishing this is that shown in the drawings, in which the spindle, 10<sup>y</sup>, of the longer cross-head is bored out from both ends with a taper-pointed drill, the two bores meeting so as to leave an annular D-shaped interiorly protruding bead or seat, 11, the aperture through which corresponds to the diameter of the spindle, 10<sup>w</sup>, of the shorter cross-head, so that the latter spindle is free to oscillate in all directions to the limit of the full diameter of the bore in the spindle, 10<sup>y</sup>. To limit this oscil-

lation to a vertical plane but at the same time to retain the spindle, 10<sup>w</sup>, in the spindle, 10<sup>y</sup>, the spindle, 10<sup>w</sup>, has an annular groove, 12, and two pins, 13, 13, are set parallel to each other vertically through the spindle, 10<sup>y</sup>, taking into the annular groove, 12, at opposite sides of the spindle, 10<sup>w</sup>, and serving both as keys to prevent the withdrawal of the spindle and also as guides between which the spindle may oscillate vertically while it is prevented from oscillating laterally. The spindle, 10<sup>y</sup>, is retained in its bearing in the operating lever by a similar expedient, an exterior annular groove, 14, being made in the spindle and key pins, 15, 15, being set through the bearing, taking into said groove leaving the spindle free to turn for preventing it from withdrawing. The dolly pin, 8, in this construction is stepped at 16, on the stem of the shorter cross-head at substantially one-fourth of the distance from the pivotal bearing of the stem, 10<sup>w</sup>, on the annular bead, 11, to the points of the pressure fingers which,—in view of the position of the fulcrum, 5, one-half of the same distance rearward from the step bearing, 16,—causes the pressure to be transmitted equally to all four fingers.

In all the forms, any two,—preferably the outer two,—fingers have each a stud, 18, engaging the holes in the vibrating cutter for actuating it.

I claim:—

1. A shear comprising a comb or fixed cutter and a vibrating cutter; an operating lever for vibrating the vibrating cutter; means for oscillating the lever and means for applying pressure to it to press the vibrating cutter upon the fixed cutter, two pairs of pressure fingers for transmitting said pressure, each pair being pivotally mounted on the operating lever for oscillation about a fore-and-aft axis midway between the two fingers of the pair, the pivotal bearings of said pairs in the operating lever being symmetrically disposed with respect to a fore-and-aft line through the pivot of the vibrating lever and the point of application of pressure thereto.
2. A shear comprising a comb or fixed cutter and a vibrating cutter; an operating lever for vibrating the vibrating cutter; means for oscillating the lever and means for applying pressure to it to press the vibrating cutter upon the fixed cutter; two pairs of pressure fingers for transmitting said pressure, each pair being pivotally mounted on the operating lever for oscillation about a fore-and-aft axis midway between the two fingers of the pair, the pivotal bearings of said pairs in the operating lever being symmetrically disposed at opposite sides of a fore-and-aft line through the pivot of the vibrating lever and the point of application of pressure thereto.
3. A shear comprising a comb or fixed cutter and a vibrating cutter; an operating lever for engaging and vibrating the vibrating cutter; means for oscillating the lever for applying pressure thereto to press the vibrating cutter upon the fixed cutter; two pairs of fingers by means of which such pressure is transmitted, the two right-hand fingers being in one pair and the two left-hand fingers in the other pair, each pair having a spindle or stem by which it is pivotally mounted on the operating lever for oscillation about a fore-and-aft axis midway between the two fingers of the pair, the bearings for said spindles in the operating lever being symmetrically disposed at opposite sides of a fore-and-aft line through the fulcrum of the operating lever and the point of application of pressure thereto.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 21st day of November, A. D. 1906.

JOHN K. STEWART.

Witnesses:

M. GERTRUDE ADY,  
J. S. ABBOTT.