2 Sheets—Sheet 1.

W. M. G. TURQUAND.

Device for Shearing Animals.

No. 206,650. **Patented July 30, 1878.**

Fig 1.

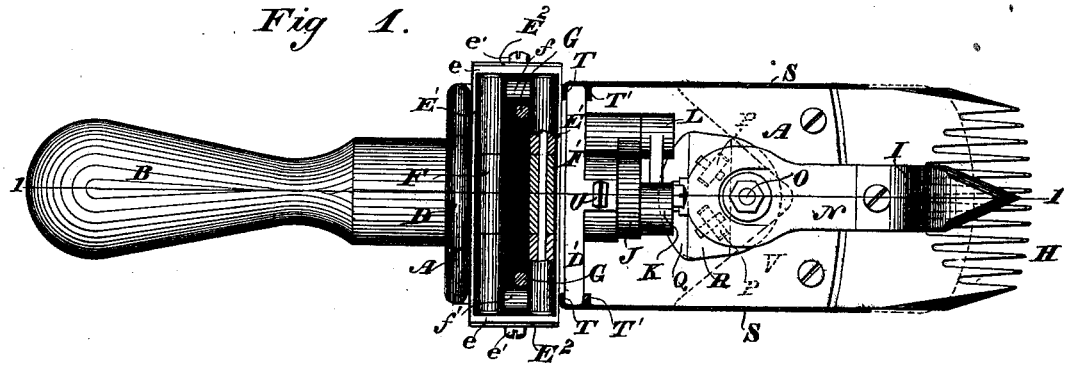
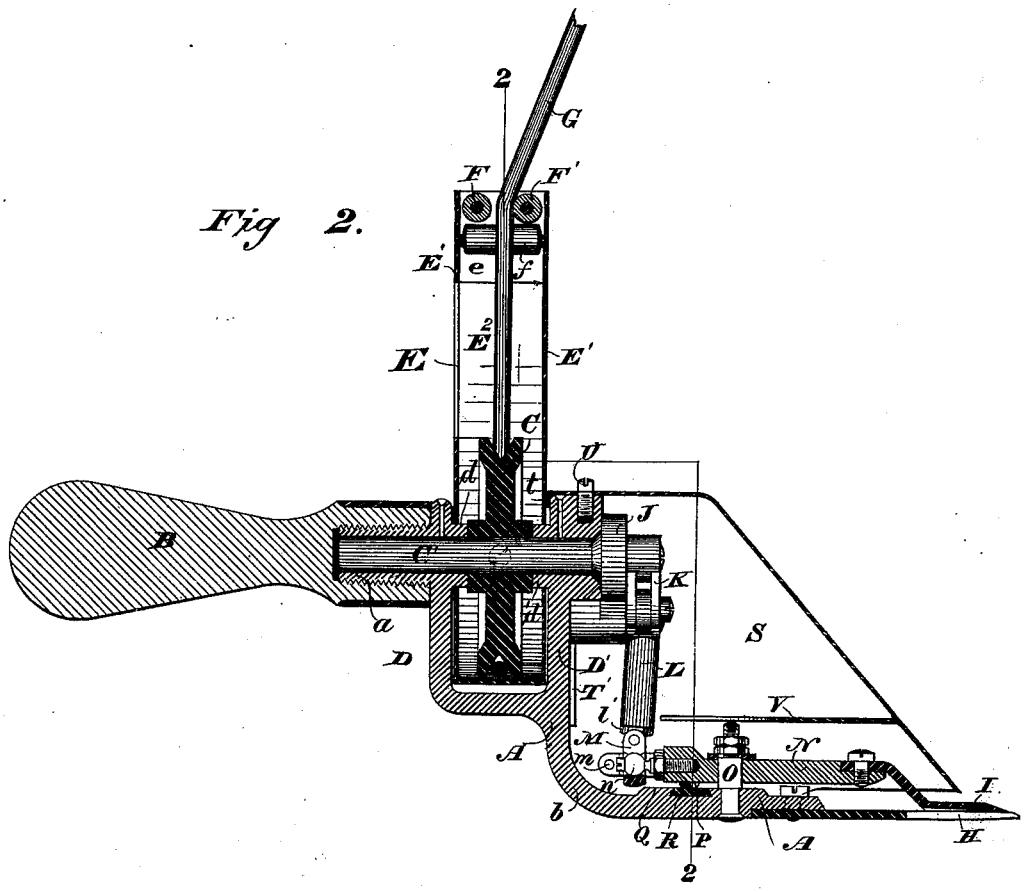


Fig 2.



WITNESSES

Wm. a Skinkle

Geo W. Breck.

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Fig 3.

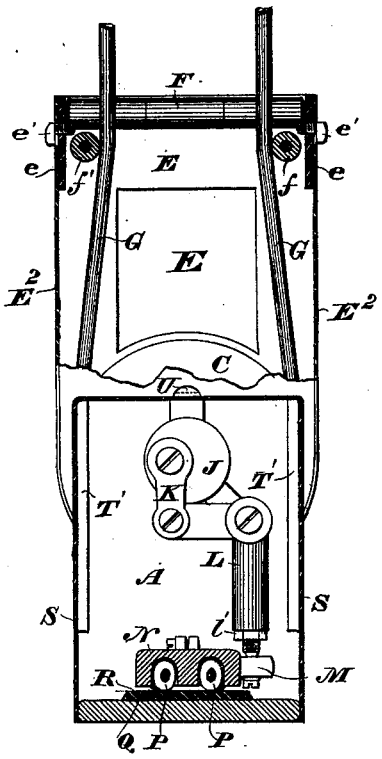
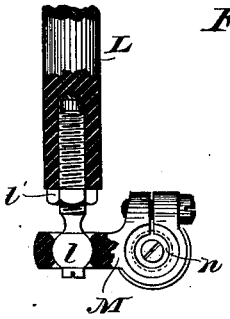


Fig 4.



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UNITED STATES PATENT OFFICE.

WILLIAM MICHAEL GLYNN TURQUAND, OF PIMLICO, ENGLAND.

IMPROVEMENT IN DEVICES FOR SHEARING ANIMALS.

Specification forming part of Letters Patent No. **206,650**, dated July 30, 1878; application filed January 21, 1878.

To all whom it may concern:

Be it known that I, WILLIAM MICHAEL GLYNN TURQUAND, of 18 Denbigh Place, Pimlico, in the county of Middlesex, England, but now residing temporarily at San Antonio, Bexar county, Texas, have invented certain new and useful Improvements in Sheep-Shearers and Animal-Clippers, of which the following is a specification:

My invention relates to apparatus for shearing sheep, clipping horses, &c., of the class in which the cutters are guided by hand and driven by connections with a band to which motion is imparted by any suitable motor.

My improvements are particularly adapted and designed for use in connection with an invention entitled "apparatus for securing sheep to be sheared," secured to me by Letters Patent of the United States, dated October 9, 1877, as No. 195,967.

My objects mainly are so to construct the apparatus as to allow of a free range of movement without interfering with the proper working of the parts, to prevent the binding of the driving-band and keep it properly connected with the vibrating knife or movable cutter-operating mechanism, and to protect the cutter-driving mechanism from clogging.

My improvements consist in certain peculiarities of construction of parts and in novel combinations of devices, which will first be described, and then specifically designated by the claims.

In the accompanying drawings, Figure 1 is a plan or top view of the apparatus, with the protecting shield or casing in section and parts of some of the belt guiding and controlling rollers broken away; Fig. 2, a vertical longitudinal section on the line 1 1 of Fig. 1; Fig. 3, a vertical transverse section on the line 2 2 of Fig. 2, showing a front elevation of some of the parts; and Fig. 4 a detail view, partly in section, showing a rear elevation of the bell-crank lever of the cutter-driving mechanism, illustrating the manner of connecting it with the heel of the vibrating knife or movable cutter.

A handle, B, for guiding and controlling the shearer, is rigidly united with a main supporting-frame, A, with which all the parts are connected. The handle is screwed upon a stud, *a*, cast with the main frame. This frame is of an angular form, one portion of it being vertical and the other horizontal, the two parts being united by the bend or curve *b*. A shaft, C′, to form the axis, about which a driving-pulley, C, revolves, is mounted in the upright part of the frame in line with the handle and in a plane parallel or nearly so with the horizontal portion of the main frame.

The upper part of the main frame is shown as bifurcated to receive and properly support the driving-pulley, whose hub turns between rounded shoulders or trunnions *d d′*, formed on the inside of the forks D D′ of the frame. A set-screw passing through the pulley and bearing against its shaft serves to detachably lock it to the shaft and prevent the pulley from turning independently of the shaft, as well as prevents accidental endwise movement of the shaft.

A belt-guiding frame, E, hinged or pivoted to the main frame upon the trunnions *d d′*, carries two pairs or sets of rollers at top, one set being arranged at right angles to the other. The rollers F and F′ are arranged on parallel shafts, which are at right angles with the handle and pulley-shaft, and the set *f f′* are arranged on shafts parallel with each other and with the handle and pulley-shaft. The shafts of the rollers F F′ span the frame E in the direction of its greatest width, and the rollers are preferably made in sections, as shown, so that friction of that part of the band moving in one direction and in contact with one portion or section of a roller will not interfere with the free revolution in the opposite direction of another portion of the roller by frictional contact with the part of the band moving in the contrary direction.

The endless band G, it will be observed, is of a size small enough to have slight play and the requisite freedom of movement between the guiding-rollers F F′. This driving-belt is elastic, and is, by preference, made of vulcanized india-rubber. It is of such a length as to be distended more or less by the weight of the apparatus in whatever position it may be held while in operation relatively to the driving-rollers, such as described in my beforementioned patent, or to such other suitable means for imparting motion to the belt as may be employed.

At the extremity of the lower and horizon-

tal portion of the bent or angular plate constituting the main frame A are a series of comb-like teeth, H, forming the stationary part of the cutter, as usual. These teeth are formed on a plate detachably but firmly secured to the main frame, the under surfaces of the toothed plate and of the main frame being flush with each other and smoothly joined together.

The vibrating knife or movable cutter I (several of which may be employed, if desired,) is operated by connections with the revolving pulley-shaft C'.

The hinged frame E, ordinarily, is kept upright or sufficiently nearly so for the proper transmission of the driving power by the tension of the band, while the main frame A is free to be rocked relatively thereto about the trunnions *d d'* by the handle B to any desired extent, to give the requisite range of movement to the cutter to adapt it to the work to be done; and the apparatus may also be tilted or inclined longitudinally to any required extent, in the usual manner, the stretching of the band admitting of all necessary movements being given the apparatus to cause the cutter to work properly. The band controlling and guiding rollers, it will be seen, always conduct the band to the driving-pulley C, while preventing binding and injurious friction. The hinged guiding-frame is prevented from rocking about the main frame to an injurious extent by contact of one side or the other of the driving-belt with its respective roller *f* or *f'*, (see Figs. 1 and 3,) while the band within the hinged frame is kept in proper position relatively to the pulley C, and disengagement therefrom prevented by the rollers F F' (to whatever extent the apparatus may be rocked longitudinally) by contact of the belt with the rollers. (See Fig. 2.)

The hinged-band guiding-frame is made in sections, the sides E^1 being united at top by connecting-pieces *e*, and the edges or ends being closed by a detachable bent band, E^2, held in place by buttons *e'*, working in elongated slots in the tops of this band. In this way free access may be had to the driving-pulley for inspection or adjustment of the driving-band by removing the edge cover or bent band, which, when in place, protects the pulley, its shaft, and the band from becoming clogged by the wool, hair, or other matter. An opening in the back or rear side of the swinging frame E, out of the way of clogging matter, may be made, to give a view of the driving-pulley.

The movable cutter is vibrated by connections with the revolving pulley-shaft C', as follows: A crank-wheel, J, is formed with or secured upon the end of the shaft, and with the crank or wrist pin of this wheel is connected one end of a forked link or short pitman, K. At its opposite end and between its forks the short arm of a bell-crank lever, L, is pin-jointed. This bell-crank is pivoted to a stud projecting from the vertical part of the main frame, and its long end is connected, by means of a ball-and-socket joint, with one end of a doubly-pivoted short arm or link, M, swivel-jointed at both ends, to connect the bell-crank with the heel of the vibrating lever N, to which the movable cutter is attached. A ball, *l*, is formed upon a screw, which is adjustably secured in the end of the elbow-lever L, (see Fig. 4,) a nut, *l'*, serving to secure the screw and ball in the required position. A split bearing or socket for the ball is provided in one end of the link M. A screw, *m*, serves to adjust the socket to receive and hold the ball. A similar socket, at right angles at the opposite end of the link M, receives the ball *m*, adjustably secured to the heel of the lever N in the same manner as the ball *l* is secured to the elbow-lever. A universal joint between the elbow-lever and cutter-lever is thus formed, as the doubly-jointed link rocks or swivels freely in all directions to the extent necessary to prevent binding or cramping of the parts and to transfer the vibratory motion of the elbow-lever to the cutter.

The cutter is detachably secured to the outer end of the lever N by its bent or angular shank, and this lever is fulcrumed or pivoted near its heel, and so as to give a wide sweep to the knife or cutter I, and thus enable a single movable cutter to traverse to and fro over all the teeth or fingers of the stationary member of the cutters. The cutter-lever vibrates on a vertical fixed stud, O, projecting from the horizontal portion of the main frame. The upper portion of this stud is threaded, and nuts and washers serve to adjust the pressure upon the lever to keep the knife down to its work and compensate wear. Anti-friction rollers P P, working in slots in the heel of the cutter-lever on each side of its longitudinal axis and on axes radial to the pivot-post O, project slightly below the under surface of the lever and bear upon a raised portion, Q, of the horizontal part of the main frame. A steel bearing-plate, R, is by preference provided for the rollers to work upon, and thus avoid injurious wear of the frame, while preserving a level surface for the rollers to move upon as the lever is vibrated. By the employment of these rollers the required pressure may be exerted upon the lever to keep the knife down to its work without producing injurious frictional contact between the heel of the lever and its supporting plate or frame.

A sheet-metal incasing hood or shield, S, to protect the mechanism for driving the cutter from wool, hair, &c., is detachably secured to the main frame. This casing is open at the back, and provided at its vertical rear edges with lips or flanges T T. Near these flanges and parallel with them are ribs T' T'. Guide-ways or grooves to fit and slide upon the edges of the upright part of the plate constituting the main frame are thus formed. A flange, *t*, projecting downward from the top rear edge of the casing, fits over the top of

the main frame and serves to strengthen the casing. A turn-button or screw, U, with an oblong head, serves, in connection with an elongated slot in the top of the casing, to secure it in position and admit of its ready removal. The casing when in position covers the parts connecting the pulley-shaft and cutter-lever.

An internal plate, V, secured to the inner sides and front of the casing, prevents the wool or hair from working upward beneath the front part of the casing, which, as shown by Fig. 2, terminates at and near its front a sufficient distance above the comb-plate and movable cutter to allow free movement and proper working of the cutter.

While I prefer to employ the elastic driving-band, in connection with the long driving-rollers shown and described in my patent referred to, it is yet obvious that a non-elastic band might be employed, in connection with a driving-wheel mounted upon a swinging arm free to move in all directions, while keeping a strain upon the band by means of springs or weights, as is well understood.

It is further obvious that the roller-carrying and belt-guiding frame may be hinged to the main frame in a manner differing from that herein set forth, and that the forking of the main frame may be avoided. I, however, prefer the construction of apparatus shown by the drawings, the operation of which will readily be understood from the foregoing description.

It will be seen that when driving-rollers, mounted in stationary bearings, as in my before-mentioned patent, are employed to impart motion to the belt, the hinged frame E will readily assume a position of inclination about corresponding to that which may be given the band by sidewise movement of the apparatus to either side of the vertical plane of the driving-roller.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the main frame, the driving-pulley, and the hinged belt-guiding frame.

2. The combination of the hinged belt-guiding frame, the pulley revolving in said frame, and the two sets of rollers, the one set mounted on axes at right angles to those of the other set, substantially as set forth.

3. The combination, substantially as hereinbefore set forth, of the angular forked main frame, the handle, the pulley-shaft mounted in the frame in line with the handle, the band-pulley, and the belt-guiding frame, hinged so as to be capable of rocking about the axis of the pulley.

4. The hinged sectional belt-guiding frame, constructed, substantially as set forth, of united side pieces and a detachable bent edge piece.

5. The combination, substantially as hereinbefore set forth, of the main frame, the movable cutter, its vibrating lever, the pivot-post upon which the lever is mounted, and the rollers at the heel of the lever, whereby the pressure upon the lever to keep the knife down to its work and compensate wear may be regulated, as set forth.

6. The combination of the pulley driving-shaft, the crank-wheel, the short pitman, the bell-crank lever, the doubly-pivoted link, connected at one end with the bell-crank lever by a ball-and-socket joint, and the vibrating cutter-lever, similarly connected to the other end of said link, these members being constructed and operating substantially as hereinbefore set forth.

7. The combination, with the main frame, of the detachable casing, having the internal protecting plate to keep out clogging matter, as set forth.

8. The combination of the angular main frame and the casing detachably connected therewith and provided with flanges and ribs to slide upon the vertical portion of the frame, as set forth.

In testimony whereof I have hereunto subscribed my name.

WILLIAM MICHAEL GLYNN TURQUAND.

Witnesses:

WILLIAM H. BURR,

GEO. W. CALDWELL.