No. 631,057. Patented Aug. 15, 1899.

W. W. VIRTUE.

MACHINE SHEEP SHEARS.

(Application filed Jan. 11, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1

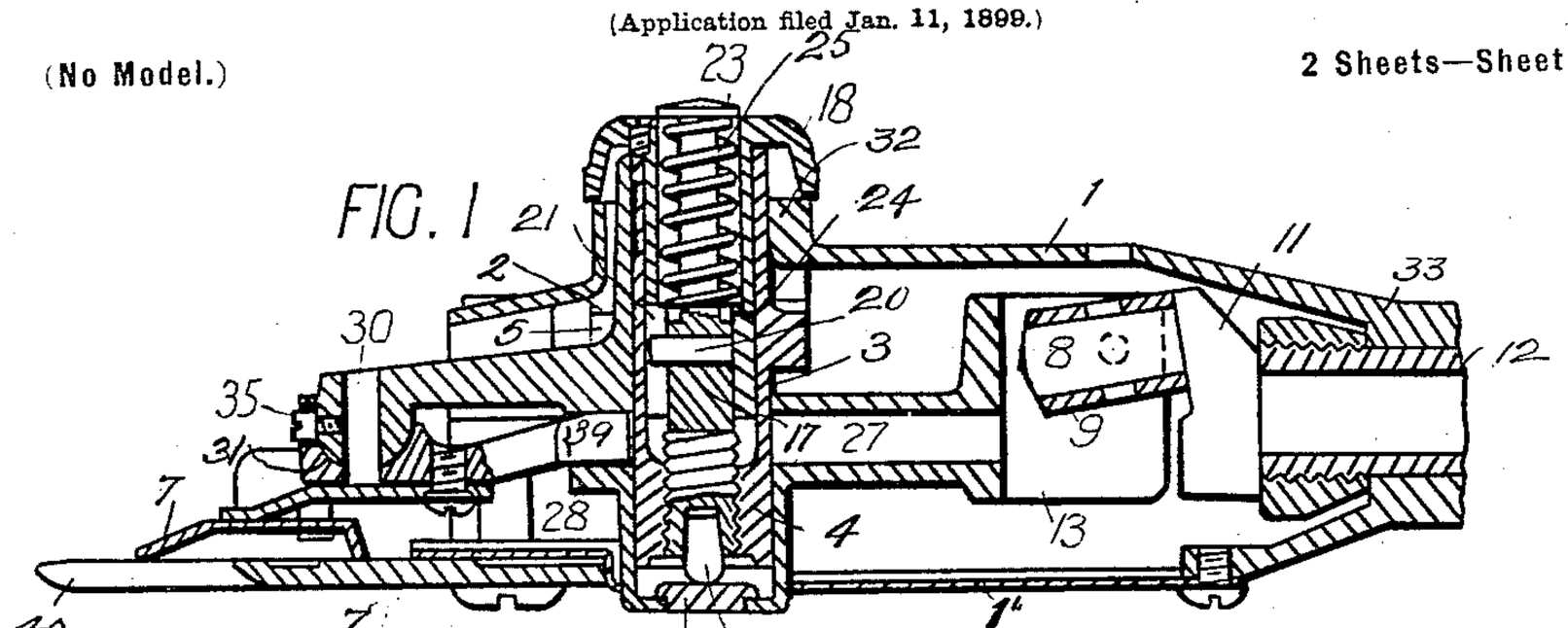

FIG. 2

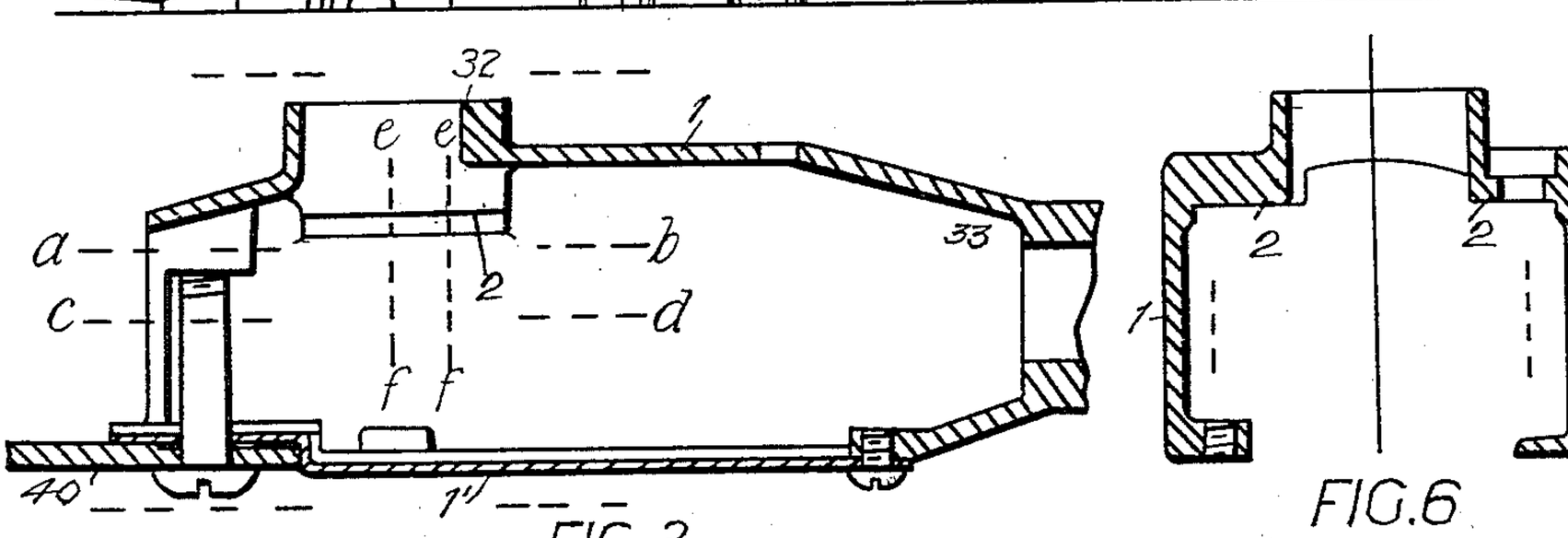

FIG. 3

FIG. 6

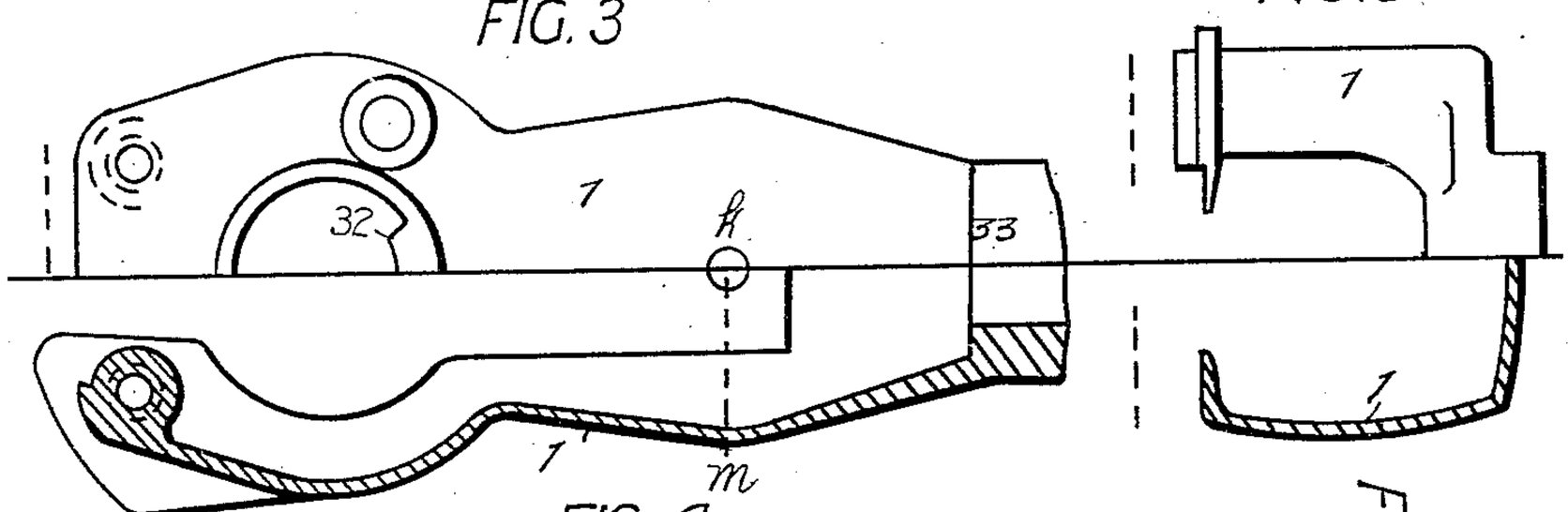

FIG. 4

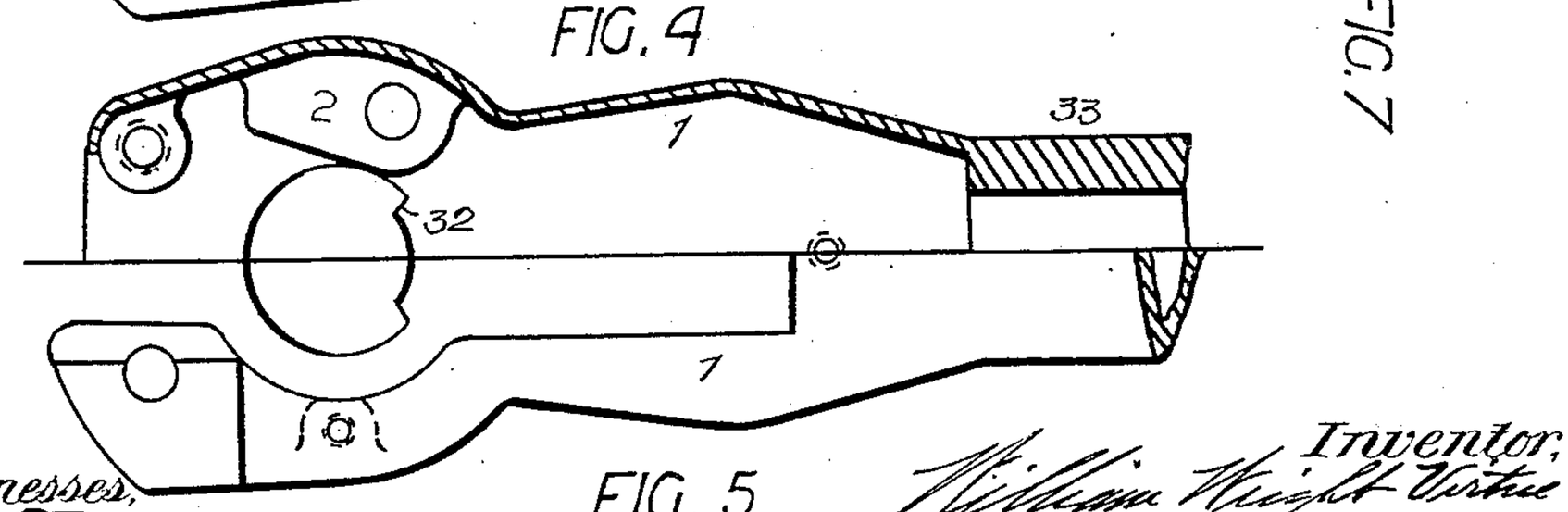

FIG. 5

FIG. 7

Witnesses,
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His Atty

No. 631,057. Patented Aug. 15, 1899.

W. W. VIRTUE.

MACHINE SHEEP SHEARS.

(Application filed Jan. 11, 1899.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 8

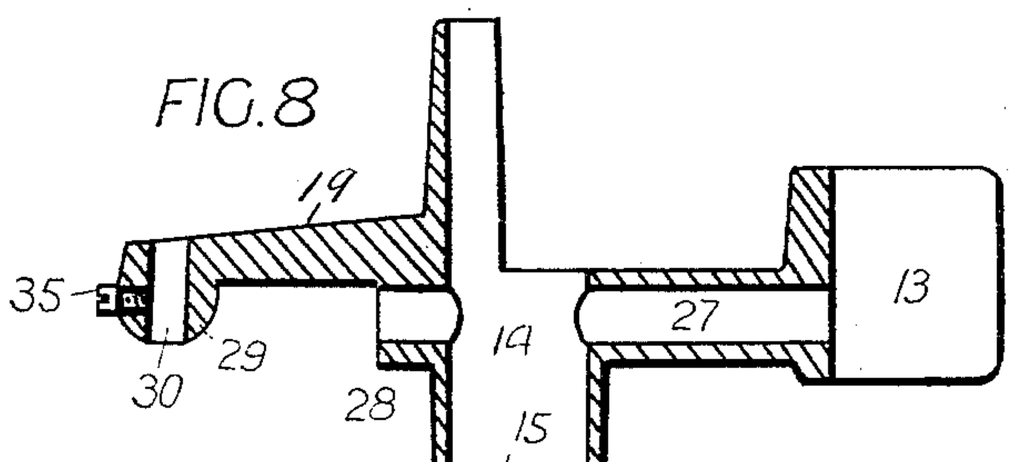
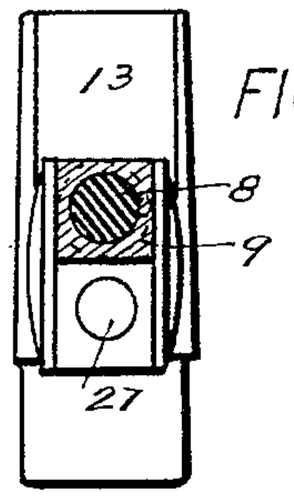


FIG. 10



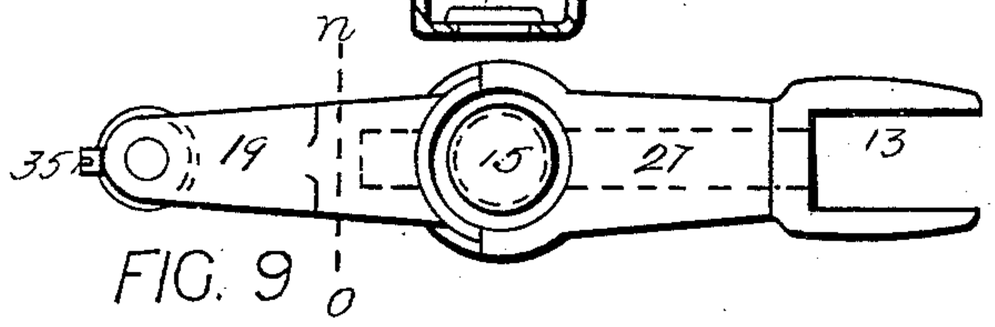


FIG. 9

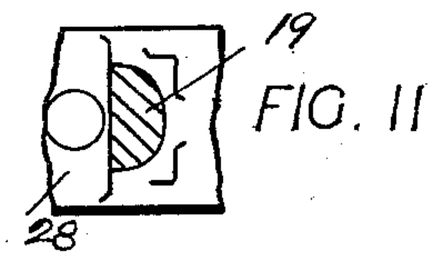


FIG. 11

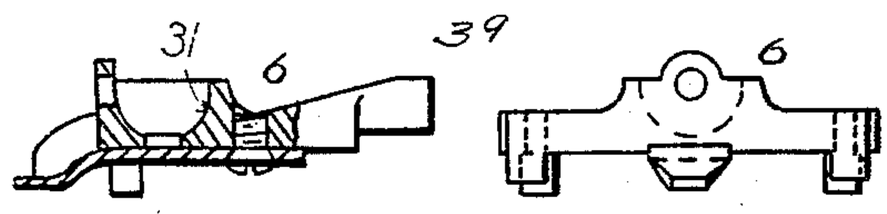
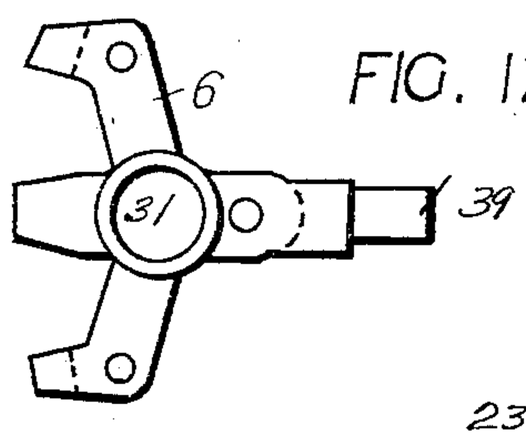


FIG. 12



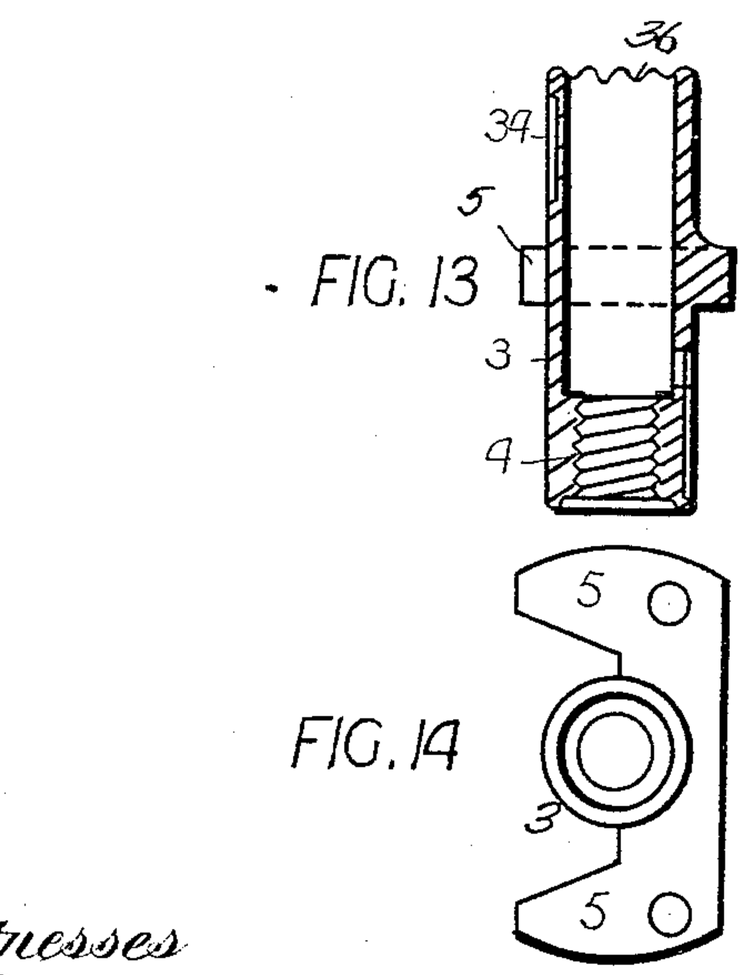


FIG. 13

FIG. 14

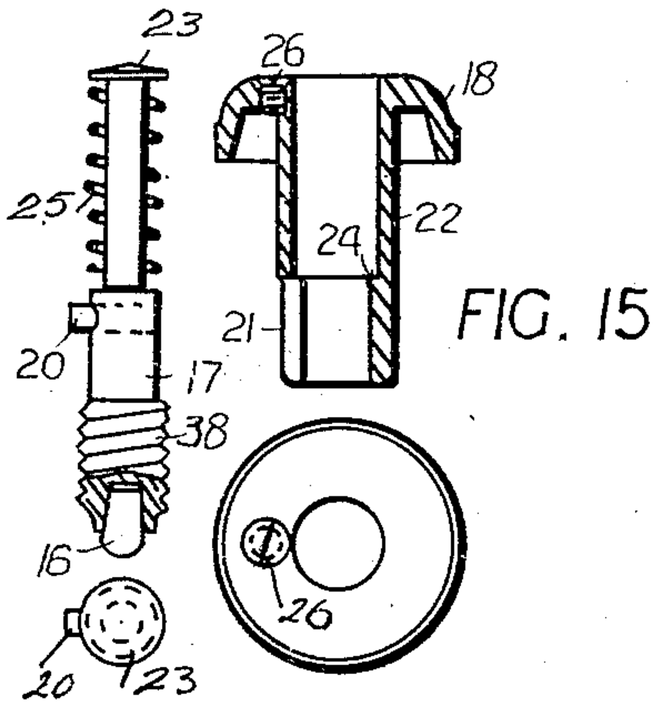


FIG. 15

Witnesses
F. F. Dawes
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By Lemuel C. Dowell
His Atty

UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT VIRTUE, OF SYDNEY, NEW SOUTH WALES.

MACHINE SHEEP-SHEARS.

SPECIFICATION forming part of Letters Patent No. 631,057, dated August 15, 1899.

Application filed January 11, 1899. Serial No. 701,863. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WRIGHT VIRTUE, a subject of the Queen of Great Britain and Ireland, residing at Sydney, in the Colony of New South Wales, have invented new and useful Improvements in Machine Sheep-Shears, of which the following is a specification.

Machines constructed according to the present invention are characterized by a casing which is not divided and by certain improvements in the mounting of the cutter-bar and in the mechanism for applying "tension" to the cutter.

Referring to the annexed drawings, Figure 1 is a longitudinal section through the machine; Fig. 2, a half top plan of same; Fig. 3, a longitudinal section through the casing; Fig. 4, a half top plan and horizontal section, taken on line *a b*, of the casing; Fig. 5, a half bottom plan and horizontal section, taken on line *c d*, of the casing; Fig. 6, a transverse section of the casing on lines *e f;* Fig. 7, a half front elevation and transverse section of the casing on the line *k m;* Fig. 8, a longitudinal section of the main lever; Fig. 9, a top plan of same; Fig. 10, a back end elevation of same, together with a cross-section of a certain pin and sleeve; Fig. 11, a transverse section on line *n o;* Fig. 12, a detail view, in longitudinal section, front elevation, and top plan, of the tension-adjusting fork; Fig. 13, a vertical section through the tubular pillar on which the lever works; Fig. 14, a top plan of same; Fig. 15, a detail view of parts for supplying tensional pressure to the lever.

The casing 1 consists of a single casting, which is closed on the lower part by a light plate 1′, which is pinned on. In the upper inside part of the casing two shoulders 2 are made and their horizontal faces trued in the lathe to parallel with the comb-seating. The pillar 3 is tubular and is screwed internally in a contracted ring 4 at its lower end. Its top edge is serrated, as shown at 36 in Fig. 13, and it is provided with a pair of lugs 5, which are trued off in the lathe to perpendicular with the axis of the pillar. These lugs fit the shoulders 2, to which they are pinned by screws, the slotted head of one of which appears at 37 in Fig. 2. The pillar is thus firmly supported from its center by the two lugs together forming a bridge in such a way that it cannot get out of true as regards the comb-seating, and this great advantage is secured with a minimum of expense for machining and fitting and with parts of extremely simple design. It is highly necessary for smooth running that the axis of oscillation of the lever should be precisely at right angles to the face of the comb 40, on which the cutter 7 works. The tubular pillar, with central lugs for mounting it in the case, is not broadly novel. It is described in the specification of patents previously granted to me. What is novel is the combination, with such tubular pillar, of a lever the planes of oscillation of which are always parallel and no part or attachment of which has a fore-and-aft-canting adjustment. In previously-designed machines in which the tubular lugged pillar is used the lever is made to oscillate in a plane which is invariably fixed, and the tension is applied by means of an auxiliary lever mounted in the fore end of the main lever and capable of pivotal motion in a vertical plane relatively thereto, canting fore and aft for the purpose of pressing on the cutter more or less without altering the vertical position of the main lever relatively to the comb-face.

In the construction illustrated in the accompanying drawings a tension-adjusting fork 6 is provided, which is capable of settling itself between the cutter and the lever for the purpose of equalizing tension transversely on the two outer knives of the cutter 7. In consequence of the unequal grinding of the cutter it is necessary to provide means for equalizing pressure over all parts of the same. It is not novel to provide for this purpose a fork capable of partial rotation on a center radial to the axis of oscillation of the main lever; but the particular and advantageous construction of parts in my present invention by which this result is obtained is novel.

The axis of the hollow overhung pin 8, on which the square sleeve 9 is mounted, is radial to the axis of oscillation of the main lever. This hollow pin is set eccentrically on the disk 11, in which the driving-spindle 12 terminates, and by the rotation of the said disk

conveys motion to the lever. The sleeve 9 works neatly between jaws 13 on the back end of the lever and converts the conical circular motion of its pin 8 into plane reciprocating motion. The middle part 14 of the lever is tubular, forming a hub, and is fitted to work on the tubular pillar. The rear half of its upper portion is cut away to provide clearance for setting and working it on the said pillar. The foot of its bored central part 14 is provided with a hardened plate 15, on the center of which the footstep-point 16 of the tension-pin 17 bears. When the thumb-nut 18 is rotated, the point 16 rises or falls and applies or relieves pressure on the lever. It is important that the thumb-nut should not vary its vertical position relatively to the casing of the machine, and it is also desirable that while the center bearing on which the oscillation of the lever takes place should be of liberal length the height of the machine should not be unduly increased. A uniform shape of casing convenient for handling facilitates work with the machine. The pin 17 is screwed at its lower part 38 to work in the tapped part 4 of the pillar 3 and is provided with a feather-pin 20 to work in the vertical slot 21 in the sleeve 22 of the thumb-nut 18. The top end of the pin 17 is formed with a cap 23, between which and the internal shoulder 24 of the sleeve 22 a spiral spring 25 in compression is set. 26 is a pin entered through thumb-nut 18, and whose point is adapted to engage in the serrated top 36 of the tubular pillar. The tubular-pillar footstep-bearing construction has many advantages. Bearings of liberal area are obtained by forming the lever with a hub-center which incases the pillar, while the upward thrust due to the reaction of the tension is taken on a frictionless point at the center of oscillation. The hub-lever principle is not broadly novel; but the adaptation of a design in which that principle is used to combine therewith tension mechanism operating by sliding the lever-hub along the tension-pillar vertically and a rocking fork for equalizing tension on the cutter is novel. The rear wing of the lever is bored (27) to obtain lightness while preserving rigidity, and the boring is extended through the lug 28, which makes a seating for the rounded rear end 39 of the fork 6. The end of the forward wing 19 of the lever terminates in a hemispherical part 29, which is cored out (30) for lightness. This hemispherical part 29 fits into a cup 31 on the back of the fork.

The rear part of the upper end of the tubular pillar 3 is supported by a pillar-piece 32 on the upper part of the case, and its rigidity is thereby insured. The design of the case is such that it is well adapted for handling. The shank 33 is little more than an inch in width and forms an oil-bath for the spindle 12, and the girth increases gradually toward the cutter, contracting somewhat rearward of the pillar 3 to make a good hand-grip.

34 is an oil-gutter.

35 is a pin screwed into the hemispherical part 29 and loosely engaging an opening in the front side of the cup 31 to prevent the fork from falling out of place when the thumb-nut is eased back or the cutter withdrawn.

The interior of the tubular pillar forms an oil-reservoir from which all parts of the center bearing are oil fed.

There is a maximum of simplicity in the design and a minimum number of parts. When the machine is taken adrift, there are only five removable parts exclusive of the comb and cutter—viz., the square sleeve 9, the lever, the fork 6, the tubular pillar 3, and the tension-pin 17. The pin 17, thumb-nut 18, and spring 25 are not adapted to be taken apart except in the workshop.

The mode of operation of the machine is as follows: Cutting is performed, as is usual, by the reciprocation of the cutter over the comb, said reciprocation being performed by the lever, which converts the rotary motion of the shaft into reciprocating motion. The conical pendular motion of the square-sleeved crank-pin is not novel. The necessary pressure on the cutter, usually termed "tension," is obtained by screwing round the thumb-nut 18. This movement does not alter the height of the nut relatively to the casing; but it does alter the vertical position of the pin 17 in the tubular pillar 3 by screwing it up or down in the tapped collar 4 in the lower end of the said pillar. The rotation of the nut 18 and its sleeve 22 is communicated to the pin 17 by the feather 20, which works in the vertical slot 21 in the sleeve 22. The screwing down of the pin 17 causes the point 16 to bear upon the hardened plate 15 and press the lever down to a lower plane and support it there inflexibly. The lever is free to fall lower when the depth at the cutter is reduced; but it cannot rise until the thumb-nut 18 is eased back. The distribution on the three tines of the cutter of the tensional pressure thus applied to the lever is effected by the fork 6, whose fingers are constructed in the usual way and provided with dowels. The middle finger is formed of a flat spring. The rear end of the shank of this fork rests in the seating 28 and its forward part presses up against the hemispherical end 29 of the lever.

The machine is taken adrift readily, and almost as quickly set up again by a reverse action, by screwing out the tension-pin 17 and removing the closure-plate 1′ and the comb and cutter and taking out the two pins 37, by which the wings 5 of the tubular pillar 3 are fastened to their seatings 2.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter; of a tubular pillar fixedly associated with the case, a main lever journaled upon said pillar with provision for longitudinal movement, a tensioning device in-

terposed between the said lever and the cutter, and tension-adjusting means in the tubular pillar, substantially as described.

2. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter; of a tubular pillar fixedly associated with the case, a main lever journaled upon said pillar with provision for longitudinal movement, a fork loosely engaged with the said lever and bearing upon the cutter, and tension-adjusting means in the tubular pillar, substantially as described.

3. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter, of a tubular pillar fixedly associated with the case, a main lever journaled upon said pillar with provision for longitudinal movement and having a hemispherical portion at the forward end, a fork having a cup engaging said hemispherical portion of the lever and loosely engaged with the latter, said fork bearing upon the cutter, and tension-adjusting means in the tubular pillar, substantially as described.

4. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter, of a tubular pillar fixedly associated with the case, a main lever journaled upon said pillar with provision for longitudinal movement and having a hemispherical portion at the forward end, a fork having a cup engaging said hemispherical portion of the lever and a rear end portion or stem seating in a recess of the lever, and tension-adjusting means in the tubular pillar.

5. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter; of a tubular pillar fixedly associated with the case and having an interiorly-screw-threaded portion, a lever journaled upon said pillar with provision for longitudinal movement, an adjusting-pin engaging said interiorly-screw-threaded portion of the pillar and having a bearing-point engaging the lever, and a tensioning device interposed between the lever and the cutter, substantially as described.

6. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter; of a tubular pillar fixedly associated with the case and having an interiorly-screw-threaded portion, a lever journaled upon said pillar with provision for longitudinal movement, an adjusting-pin engaging said interiorly-screw-threaded portion of the pillar and having a bearing-point engaging the lever, an adjusting-nut interlocked with the pin with provision for relative longitudinal movement, and a tensioning device interposed between the lever and the cutter.

7. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter; of a tubular pillar fixedly associated with the case and having a serrated upper end and an interiorly-screw-threaded portion, a lever journaled upon the pillar with provision for longitudinal movement, an adjusting-pin engaging said interiorly-screw-threaded portion of the pillar and having a bearing-point engaging the lever, an adjusting-nut interlocked with the pin with provision for relative longitudinal movement and having a projection engaging the serrated end of the pillar, a spring interposed between the nut and the pin, and a tensioning device interposed between the lever and the cutter.

8. In a shearing-machine, the combination with a suitable case having a comb-seat, a comb, and a cutter; of a tubular pillar fixedly associated with the case, a main lever journaled upon said pillar with provision for longitudinal movement and having a bearing-plate extending under the pillar, an adjusting-pin in the latter having a point engaging said bearing-plate, means for fixing said pin at different positions of adjustment, and a tensioning device interposed between the lever and the cutter.

In witness whereof I have hereunto signed my name, this 14th day of February, 1898, in the presence of two subscribing witnesses.

WILLIAM WRIGHT VIRTUE.

Witnesses:
CHARLES G. HEPBURN,
WILLIAM J. DAVIS.