No. 614,078. Patented Nov. 15, 1898.

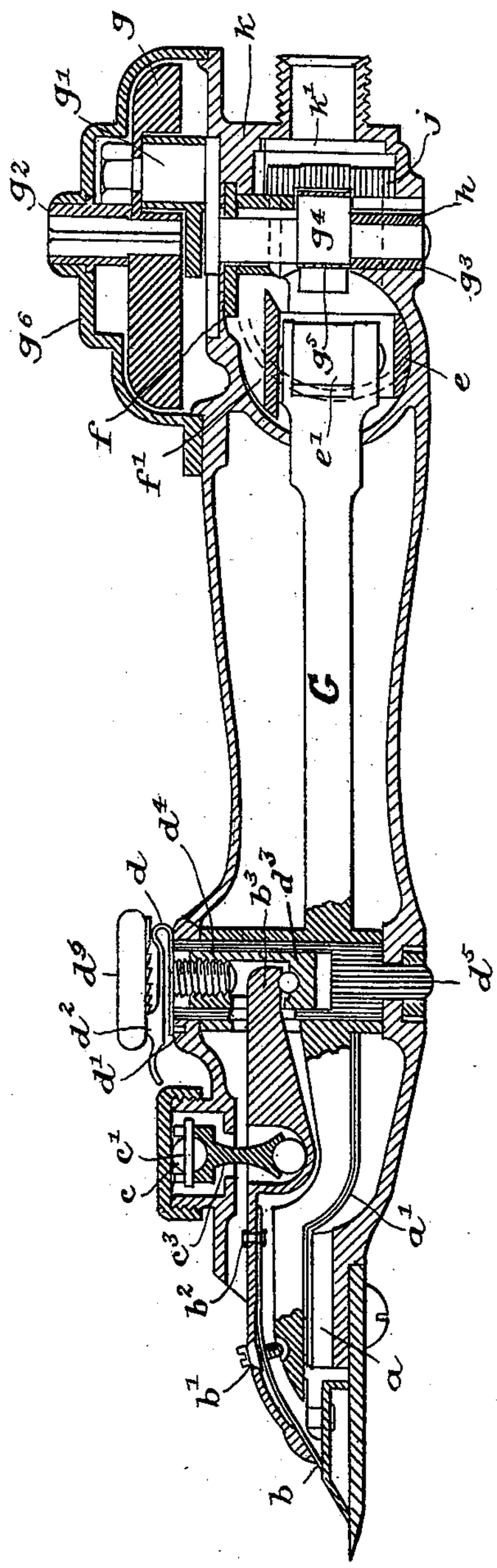
H. BLAND.

SHEEP SHEARS.

(Application filed Sept. 21, 1897.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

E. B. Bolton

O. D. Munk

INVENTOR

Henry Bland

BY Richards & R

ATTORNEYS

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H. BLAND.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

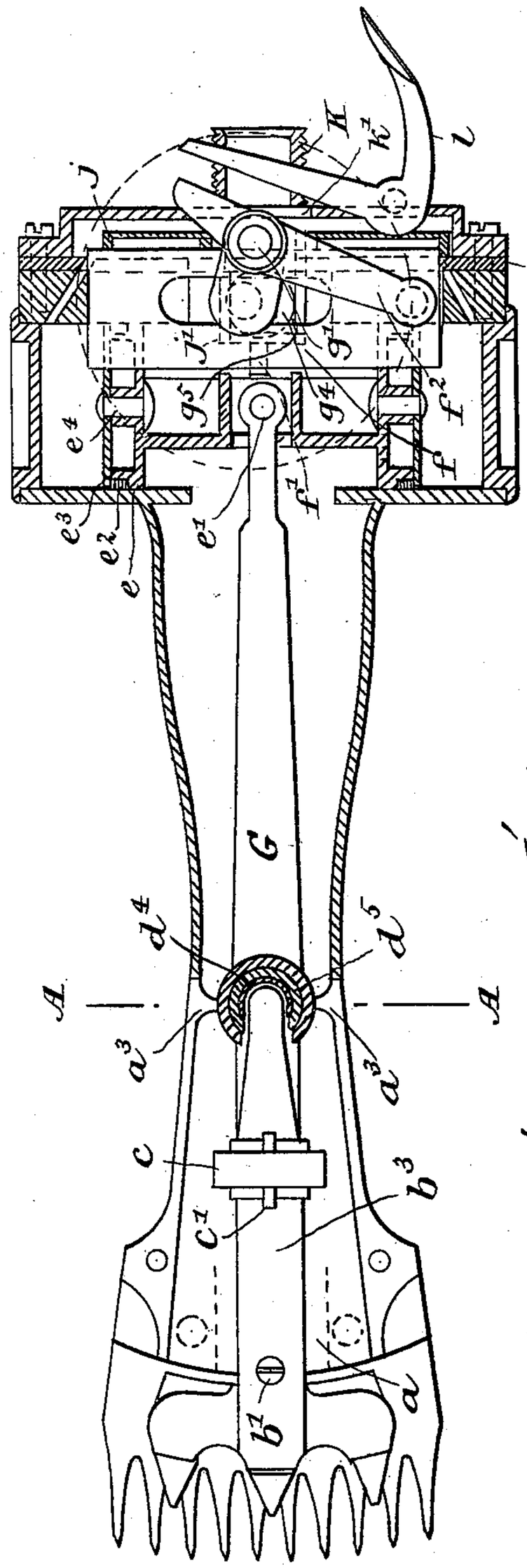


Fig. 13.

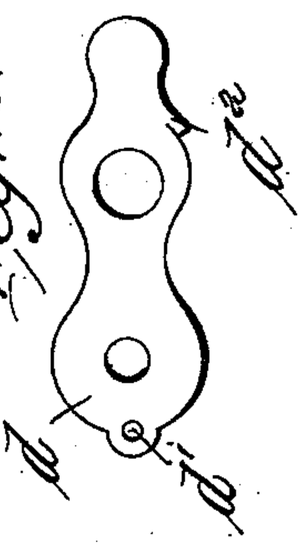


Fig. 11.

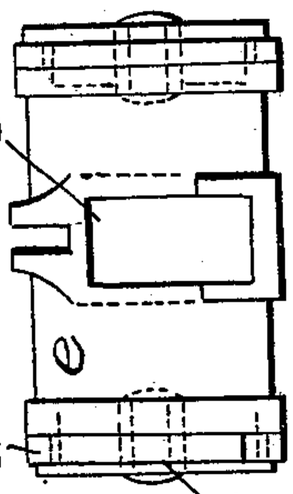
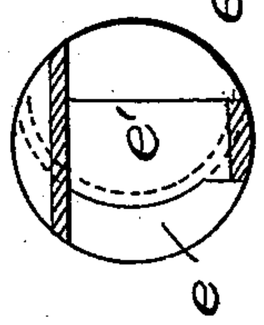


Fig. 12.



WITNESSES:

E. B. Bolton

Otto Munn

INVENTOR

Henry Bland

BY Richards & Co

ATTORNEYS

No. 614,078. Patented Nov. 15, 1898.

H. BLAND.

SHEEP SHEARS.

(Application filed Sept. 21, 1897.)

(No Model.) 3 Sheets—Sheet 3.

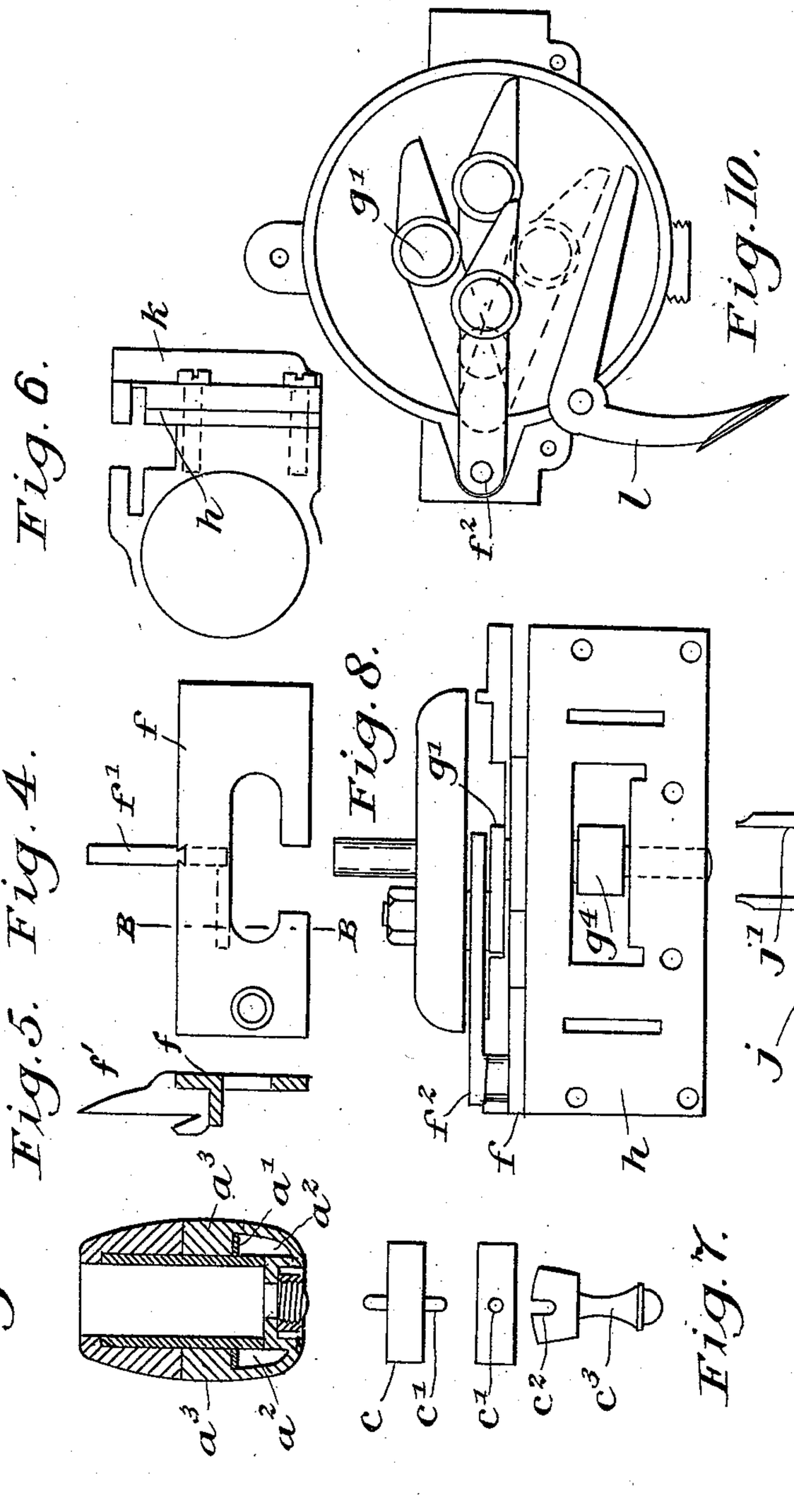


Fig. 6. Fig. 10. Fig. 8. Fig. 4. Fig. 5. Fig. 3. Fig. 9.

Fig. 7.

WITNESSES:

E. B. Bolton

O. Bowman

INVENTOR

Henry Bland

BY Richards & Q

ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY BLAND, OF WAVERLY, NEW SOUTH WALES, ASSIGNOR TO JAMES MARTIN, OF SYDNEY, NEW SOUTH WALES.

SHEEP-SHEARS.

SPECIFICATION forming part of Letters Patent No. 614,078, dated November 15, 1898.

Application filed September 21, 1897. Serial No. 652,460. (No model.)

To all whom it may concern:

Be it known that I, HENRY BLAND, a subject of the Queen of Great Britain and Ireland, residing at Ashley street, Waverly, near Sydney, in the Colony of New South Wales, have invented certain new and useful Improvements in Sheep-Shears, (for which I have obtained patents in New South Wales, No. 6,749, bearing date July 28, 1896; in Queensland, June 16, 1897, No. 3,508, and in Victoria, No. 13,442, dated August 29, 1896,) of which the following is a specification.

The objects of my invention are to provide improvements in sheep-shears.

The invention consists in the construction and arrangement of parts hereinafter described, and particularly set forth in the claims.

I will now proceed more particularly to describe my invention, which the accompanying drawings will illustrate, the same letters of reference indicating corresponding parts in all the figures.

Figure 1 is a sectional elevation. Fig. 2 is a plan with the front cover removed, the rear portion in section broken away around the slide. Fig. 3 is a section on line A A of Fig. 2. Fig. 4 is a plan of the piston-slide. Fig. 5 is a section of the same through line B B, Fig. 4; Fig. 6, a side view of case, showing the beds of the slide; Fig. 7, improvements in the roller-tension. Fig. 8 is a back end view of the port-face, slide, connecting-rod, and governing-wheel; Fig. 9, a side view of the valve, showing spurs; Fig. 10, a view of the mechanical starter with the connecting-rod and crank in different positions; Fig. 11, an elevation of the piston; Fig. 12, a central section of same; Fig. 13, a plan of keep-spring before it is folded.

a is the emission-port shown in Figs. 1 and 2; a', muffle-plate shown in Fig. 1; a^2, air-passages shown in Fig. 3; a^3, webs at side of lever-stud shown in Fig. 2.

b is the finger-spring shown in Fig. 1; b', its conical screw and seating; b^2, its rivet.

b^3 is cutter-driver; c, the tension-bar shown in Fig. 7; c', the position-pin; c^2, slots in wings of rocker.

c^3 is the rocker.

d is the keep-spring shown in Figs. 1 and 13; d', its holding-pin; d^2, its locking-tooth.

d^3 is the tubular nut.

d^4 and d^5 are the adjusting-screw and tubular stud.

e is the piston shown in Figs. 1, 2, 11, and 12; e', the lever-joint; e^2, the piston-ring; e^3, its flanges; e^4, its central rivets.

f is the piston-slide shown in Figs. 1, 2, 4, and 8; f', its coupling-feather; f^2, the connecting-rod, Figs. 2, 8, and 10; g, the governing-wheel shown in Figs. 1 and 8; g', its crank and spindle, Figs. 1, 2, 8, and 10; g^2 and g^3, steel bearings; g^4, its eccentric; g^5, eccentric-sleeve; g^6, the wheel-cover.

h is the port-plate shown in Figs. 1, 2, and 6.

j is the valve shown in Figs. 1, 2, and 9; j', its driving-spurs.

k is the air-chest cover shown in Figs. 1, 2, and 6.

k' is the recess for flange of air-joint.

l is the mechanical starter shown in Figs. 2 and 10.

The particular kind of motor that I prefer to use to operate the actuating-lever G in this combination is the early type (known as the "cross-cylinder," whose power is applied direct to the operating or rear end of the actuating-lever) consisting of a pair of single-acting cylinders, whose pistons, being connected by a bridge-piece, are situated one on each side of the lever.

In the space between my cylinders at the rear of actuating-lever G, I place vertically a steel bearing g^3, Fig. 1, which I will hereinafter call the "lower" bearing. This carries the lower end of my crank-spindle, the governing-wheel g, Figs. 1 and 8, being situated just above the cylinders. Its upper end is also carried in a similar steel bearing g^2, Fig. 1, placed in the wheel-cover, which I shall hereinafter call the "upper" bearing. This crank-spindle g', Figs. 1, 2, 8, and 10, rotates within the port-plate on the cylinder side and carries upon its body an eccentric g^4, Figs. 1, 2, and 8, to operate the valve. My valve j, Figs. 1, 2, and 9, is of a peculiar kind, being provided at its center with two steel spurs j', Figs. 2 and 9, that project from its inner face through a slot in the port-plate aforesaid.

These spurs embrace a loose sleeve g^5, Figs. 1 and 2, that fits upon the eccentric, receiving motion therefrom as the spindle rotates, moving the valve without the usual connection through the air-chest, the motion being thus quite sealed from the air-pressure.

The peculiar "slide" f, Figs. 1, 2, 4, and 8, that I use is flat in form and slides in two horizontal grooves, Fig. 6, one on the cylinder side, the other situate in the air-chest cover. This slide is slotted at its center, Figs. 2 and 4, so as to surround the crank-spindle and is equal in length to the crank-stroke. Attached crosswise at its center on the cylinder side is a feather, Figs. 1, 4, and 5, descending a suitable distance into the bore of cylinder to engage a slot provided to receive it near the center of connecting bridge-piece, Fig. 11. Thus it will be obvious that as the pistons are alternately propelled from side to side they must carry this slide with them, and in its motion it becomes, as it were, part of the pistons, although sliding outside the cylinder-bore. At one extreme end of this slide I place a suitable steel bearing to receive the pin of connecting-rod, Figs. 2 and 4. The other end of this rod embraces the crank. Both the crank and connecting-rod fit into a recess in the governing-wheel and are securely attached to said wheel by a nut on its upper side. Thus the governing-wheel receives its motion direct from the slide, which is operated by the pistons and efficiently controls their motion by preventing knocking at the cylinder ends, also preventing the loss of time, as heretofore, at the ends of their stroke and insuring a steady even motion, capable of very high speed, as the momentum received from the pistons at the instant of their greatest acceleration is available at the ends of their stroke, efficiently controlling and starting their return, permitting the fullest power development, less only the slight friction of the moving slide. The very small space occupied by this thin slide, connecting-rod, and crank renders it a most compact and durable motion.

My reliance finger-spring b, Fig. 1, is provided with a novel adjustment. The finger-spring is carried in the recess of cutter-driver similar to my Letters Patent No. 6,749, dated July 28, 1896, but is much longer. At the extreme rear end I rivet it firmly to the cutter-driver. About midway from this rivet to the toe of spring I provide a screwed hole. Into this I fit a screw of peculiar form b', Figs. 1 and 2, rising from the square shoulder. Next to the spring is a short conical portion or body. The head from this portion is continued sufficiently for the usual nick for turn-screw.

In the body of the cutter-driver a corresponding conical seating is formed, the screw being placed in the screwed hole in the spring, which fits the curvature of the grooved bed in the cutter-driver and is riveted at the rear end. The tension of this rivet presses the conical body of the screw into the seating, so that when a greater degree of tension is required it is slightly unscrewed from the spring, thence pressing down the toe upon the cutter, while the conical head is pressed more firmly into its seating. Thus it is held firmly from turning in either direction, and as it is contained within the recess it cannot become detached while the spring remains riveted and intact. Although so easy of adjustment, it is very reliable.

My improved keep-spring d, Figs. 1 and 13, has a circular base fitting the cover of machine, with a small hole to fit over a holding-pin to prevent it turning. At the center of this base a hole is provided for the passage of the tension or adjusting screw, the shoulder of screw bearing upon it. The upper portion is folded over and is provided with a larger hole, through which the shoulder of thumb-screw freely passes. The front portion extends sufficiently forward and is turned down just behind the rocker-cap. This gives facility for its release by the pressure of the thumb or finger. At one side of this projection a tooth or catch is formed d^2, Figs. 1 and 13, and turned upward so as to engage a series of ratchet-teeth formed upon the under side of the head of tension-screw, so that as the tension-screw is screwed downward this spring engages its teeth and securely locks or prevents its running back except when released.

My improved piston e, Figs. 1, 2, 11, and 12, is designed to give the greatest strength per weight of metal and to provide facility for placing the rings without springing on, and is formed as follows: The flanges are connected by a bridge-piece of peculiar form. At its center is a square frame to receive the joint of actuating-lever, permitting freedom of adjustment therein, while giving the best wearing-surfaces. The flanges are connected to this by semicircular pieces, which facilitate the use of a central rivet e^4, Fig. 2, in each flange to attach a washer after the rings are placed in position. This gives a piston of a durable and more perfect form. The groove to receive the feather of slide is placed centrally, Fig. 11, and above the square framing hereinbefore referred to.

My improved muffle-plate a', Fig. 1, is placed at the front end of machine-case, the rear portion of case being closed. The exhaust-air is directed downward by a web a^3, Fig. 2, at each side of the stud of actuating-lever and open only at the bottom a^2, Fig. 3. From thence it passes under this thin plate that fits into the front part of case to a passage formed between the comb-screws, this being the emission-port a, Figs. 1 and 2, so that the blow of the air is wholly concentrated upon and under the heel of cutter and upon the comb, keeping them much cooler than heretofore, while the surplus oil that passes away in spray will be made available to lubricate the cutter and comb much better than here-

tofore, and the noise of escaping air is very much deadened or subdued.

The construction of my improved tension is as follows: I place in the upper part of case a suitably-supported round steel bar, which I will hereinafter call the "tension-bar" *c*. This bar carries at its center a crossway tooth or pin *c'*. Below this tension-bar is placed a segmental rocker c^3, provided with a semicircular grooved or bifurcated edge corresponding to and fitting the bar. In the wings of this rocker slots c^2 are formed to receive the positional tooth, (or pin if preferred,) which maintains it in correct position longitudinally upon the bar and permits it to roll freely sidewise to the recession-curve without other support. It receives its adjustment in the following manner: The tail end of the cutter-driver extends rearward to the center bolt or pivot of the actuating-lever G. A nut d^3 fits within this bolt, which is tubular. These are both, together with the boss of the actuating-lever, slotted upon the front side, so as to permit the tail end of cutter-driver to be passed into the axial center. This tail end is formed hemispherical and fits into a corresponding cup formed in the bottom of nut d^3. The upper part of this nut is screwed internally, and into this is fitted a thumb-screw, the shoulder of which rests upon the keep-spring on top of case hereinbefore described. When the nut d^9 is raised by turning the thumb-screw, the tail of cutter-driver is drawn upward, the rocker receiving the pressure and transferring it to the resistance-bar, which becomes the fulcrum of this tension, the cutter-driver therefrom pressing down the cutter upon the comb to the necessary degree of tension as may be desired.

The mechanical starter *l*, Fig. 10, I place at the rear of the machine immediately under the governing-wheel. In form it is similar to a bell-crank lever, having as its fulcrum a long stem which is riveted therein. This stem fits in a small socket provided on the outside of air-chest. The center of this socket coincides with the circle of the wheel-cover. The long arm of the bell-crank lever being equal in thickness to the arm of connecting-rod, it operates under the wheel in the same space. The outside arm of lever is broadened at the end for the thumb-rest.

Its operation is as follows, (see Fig. 10, where the crank *g'* is shown in different positions, two being straight with the moving slide, the crank being shown upon its centers:) When the starter is pressed in by the thumb, its inside limb will push the crank over to starting position *g'*, and as soon as the thumb is withdrawn it flies back to clear by the action of a suitable spring. (Not shown.) This I prefer should be done (when the machine stops upon its center) before the air is turned on. In other styles of machines this difficulty is only partially overcome by pushing the cutter over the comb. Previously it was often necessary to apply blows to start the crank over its center.

Some of these improvements are applicable to steam or other power-driven machines, the automatic oiler, and the universal air-joint; to other styles of compressed-air machines; also to any intermittent pneumatic or elastic fluid-driven machines, such as rock-drills, coal-cutters, and in gunnery, where the pressure is supplied by means of rubber hose, and to these extended purposes I claim their use.

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

1. In combination, the frame or casing, the cylinder arranged transversely thereof, the actuating-lever pivoted in the casing, the cutting mechanism operatively connected with said lever, the piston moving in said cylinder and having a connection with said rocking lever, the governing-wheel journaled above the piston, and the pitman connected with the governing-wheel and piston, substantially as described.

2. In combination, the frame or casing the transversely-arranged cylinder, the cutting mechanism, the actuating-lever pivoted in the casing and operatively connected with the cutting mechanism, the piston connected with the actuating-lever, the crank-shaft journaled in rear of the cylinder, the governing-wheel carried on the said shaft, the sliding plate connected with the piston and moving therewith, and the pitman connected to said plate and to the crank-shaft, substantially as described.

3. In combination, the casing the transverse cylinder, the cutting mechanism, the actuating-lever for operating the same, the piston connected with the lever, the governing-wheel the pitman connected with the governing-wheel and piston, and the bell-crank starting-lever pivoted in the casing and adapted to contact with said pitman to push it into starting position, substantially as described.

4. In combination, the casing the transverse cylinder, the cutting mechanism, the actuating-lever, the piston connected therewith, exhaust-ports opening from said cylinder into the forward portion of the casing, and the muffle-plate located in the forward portion of the casing beneath the rocking lever, substantially as described.

5. In combination, the casing the transverse cylinder at the rear end, the cutting mechanism, the actuating-lever, the cutter-driver located above the actuating-lever, the cylinder connected with the rear end of the actuating-lever, the spring-finger having its rear end riveted to the under side of the cutter-driver, and the adjusting-screw threaded into said spring and having a conical head engaging a conical recess in the under side of the cutter-driver, the slotted portion of said head projecting through said recess, substantially as described.

6. In combination, the casing, the actuating-lever pivoted therein, with means for operating the same, the tubular nut located at the axis of said actuating-lever, the set-screw for adjusting said nut, the cutter-driver having its rear end pivotally supported in a recess in said nut, and the rocking support for said cutter-driver in advance of said pivotal connection comprising the rocker having a rounded lower end bearing resting in a socket in the cutter-driver, and having a bifurcated upper end, and the tension-bar located in said slotted portion and having a transverse position-pin resting in slots in the upper edges of the rocker, substantially as described.

7. In combination, the casing the transverse cylinder, the cutter, the actuating-lever for operating the same, and the piston within the cylinder for operating said actuating-lever, said piston comprising a central bridge-piece, the thin circular webs connecting the same, and having flanges, the washers, the rings holding the same and the central rivets for holding said rings, substantially as described.

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

HENRY BLAND.

Witnesses:
F. HARPER,
F. S. LACK.