(No Model.)

2 Sheets—Sheet 1.

D. S. CHAMBERS.

SHEEP SHEARING MACHINE.

No. 514,704. Patented Feb. 13, 1894.

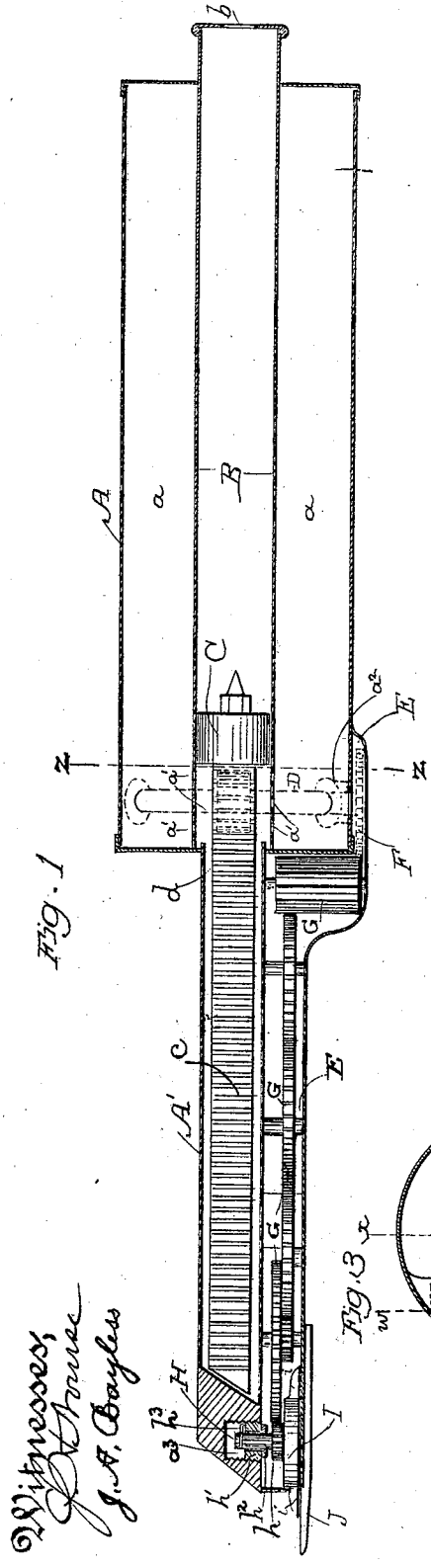

Fig. 1

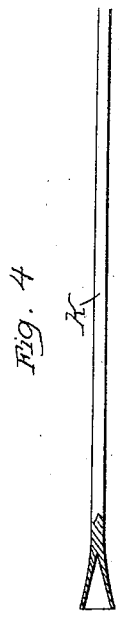

Fig. 4

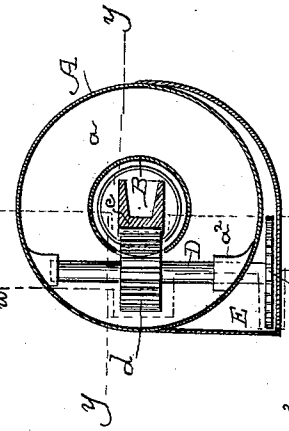

Fig. 3

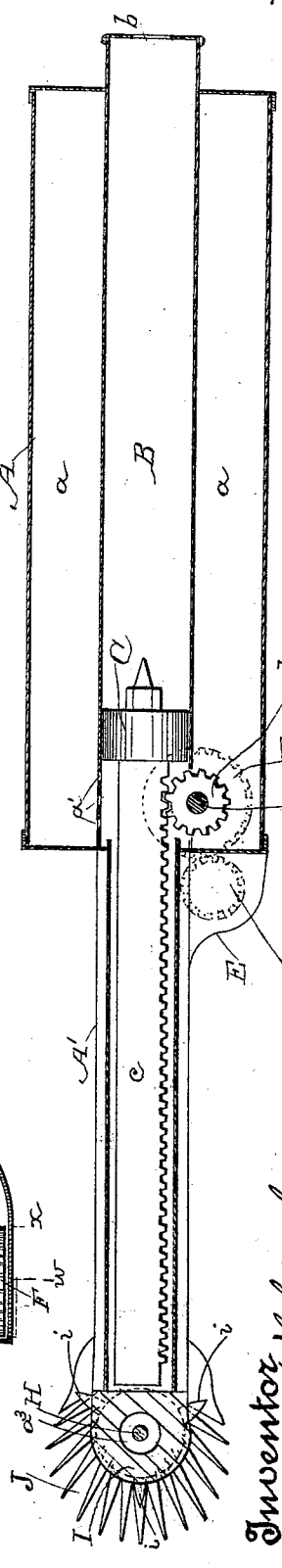

Fig. 2

Witnesses,
[illegible]
J. A. Boyles

Inventor
David S. Chambers
by Dewey & Co.
attys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

D. S. CHAMBERS.

SHEEP SHEARING MACHINE.

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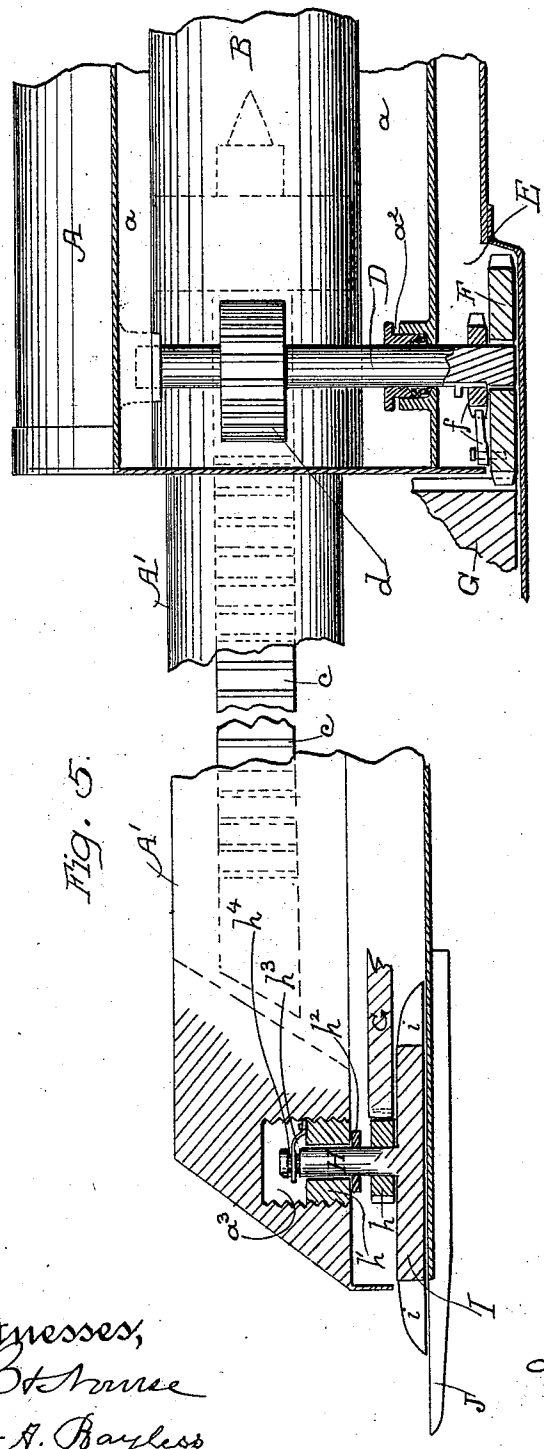

Fig. 5.

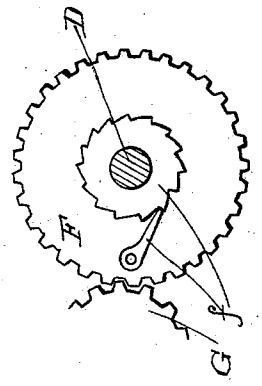

Fig. 6

Witnesses,
J. A. Bayless

Inventor,
David S. Chambers
By Dewey & Co.
Attys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DAVID SAMUEL CHAMBERS, OF SAUSALITO, ASSIGNOR OF ONE-TENTH TO HARRY LACY, OF SAN FRANCISCO, CALIFORNIA.

SHEEP-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 514,704, dated February 13, 1894.

Application filed November 1, 1893. Serial No. 489,692. (No model.)

To all whom it may concern:

Be it known that I, DAVID SAMUEL CHAMBERS, a citizen of England, residing at Sausalito, county of Marin, State of California, have invented an Improvement in Sheep-Shearing Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of cutting or clipping machines especially adapted for the shearing of sheep.

It consists in a stock, carrying at one end the shearing mechanism and formed with a reservoir for compressed air, a piston seated in the stock and actuated by the expansion of said air, and suitable power transmitting connections between the piston and the shearing mechanism whereby the latter is operated.

It also consists in the several constructions and combinations hereinafter fully described and specifically claimed.

The object of my invention is to provide a shearing instrument, the cutting mechanism of which is adapted to be actuated by the expansion of a permanently confined store of compressed air, the parts being so arranged that the return of the air propelled piston under suitable extraneous force will restore the air to initial compression, ready for a repetition of the operation.

Referring to the accompanying drawings for a more complete explanation of my invention,—Figure 1 is a longitudinal section on the line *x—x* of Fig. 3. Fig. 2 is a longitudinal section on line *y—y* of Fig. 3. Fig. 3 is a cross section on line *z—z* of Fig. 1. Fig. 4 is a view of the push rod K. Fig. 5 is an enlarged section on line *w—w* of Fig. 3. Fig. 6 is a view of the pawl and ratchet mechanism at *f*.

The stock comprises an enlarged rear portion A, and a reduced forward portion A′. The former portion is hollow and forms a reservoir *a* which is an annular one, encircling a central cylinder B, the rear end of which is apertured at *b*, and its forward end communicates with the forward portion A′, which latter is also hollow. These parts may be constructed and assembled in any suitable manner.

Within the cylinder B is seated a piston C, which has a rod *c* in the form of a rack bar, said rack bar being seated and adapted to slide within the hollow portion A′ of the stock.

The reservoir *a* has communication with the cylinder B, through small holes *a′*, said communication being only on that side of the piston toward the hollow portion A′, whereby said reservoir, the hollow portion A′ and the adjacent and communicating portion of the cylinder constitute a space within which the compressed air, to which I shall presently refer, is permanently confined.

D is a shaft journaled transversely within the stock and crossing the cylinder B. This shaft carries a pinion *d* with which the rack bar *c* of the piston engages. The lower end of the shaft passes through a suitable stuffing box a^2, into an exterior housing E, and carries loosely upon it a gear F which, through the intervention of a pawl and ratchet at *f*, is adapted to turn with the shaft in one direction and to remain stationary when the shaft turns in the other direction. Within this housing E, is a train of gears, represented by G, which is shown as adapted, toward the outer end of the housing, to multiply the speed in the usual manner. The final gear of this train meshes with a pinion *h* on a vertical shaft H, the lower end of which carries a cutter head I, provided with blades *i* in suitable number, and playing over a fixed comb J, secured to the forward end of the stock. This shaft H with its cutter head is a removable and adjustable one, the face plate or some other part of the forward portion of the stock being removable, or other provision being made for the removal of the shaft and its adjuncts, the said shaft and cutter head being mounted as follows. In the forward end of the stock is an internally threaded socket a^3, in which is seated a nut *h′*. The shaft H passes up into this nut and it has a collar h^2 upon which the base of the nut bears. The degree of pressure or bearing of the cutter head on the comb is regulated by the nut, and in order to keep this constant, even under the high rate of speed of the cutter head, which would tend to increase its pressure, I have the spring h^3, secured to the nut and engaging a groove h^4 in the upper end of the shaft, said spring tending to keep the shaft up with its collar against the nut.

The operation of the machine is as follows:

Air, under pressure, is confined within the reservoir *a* and in the hollow portion A'. Now, supposing the piston to be at the forward limit of its stroke, the compressed air expanding, will drive it backwardly, and this movement through the mechanism described will operate the rotary cutter at the front of the stock. The movement of the piston is slow, but the speed is multiplied at the cutter, and the length of the stroke of the piston is sufficient to continue the operation for a time long enough for practical purposes. When the piston has reached its back limit, the operation of the device ceases. In order to throw it into action again, the operator takes a push rod, such as is represented by K, and inserts it in the apertured rear end of the cylinder B. It bears against and centers accurately on the piston C, by the simple constructions shown, and thereupon by forcing it in, the piston C will be pushed forward to its initial position, in which movement the ratchet and pawl device at *f* will slip and allow the gearing to remain at rest. As the piston is thus forced forward it will restore the confined air to its initial degree of compression and the machine is then ready for a second use. There is no waste of air except by leakage and whenever necessary this waste can be made good.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a shearing machine, the combination of a stock formed with an interior space for confining air under pressure, a piston within said space and exposed on one side to the compressed air whereby it is moved in one direction, by the expansion of the air, suitable cutting mechanism, power transmitting connections from the piston to the cutting mechanism, and means engaging the opposite side of the piston for returning the piston to restore the body of confined air to its initial compression, substantially as herein described.

2. In a shearing machine, the combination of the stock comprising the hollow communicating portions, and cylinder forming a space in which a store of air under pressure may be confined, the piston in the cylinder exposed on one side to the compressed air whereby it is moved by the expansion of the air, the rod or bar of the piston seated in the hollow forward portion of the stock, suitable cutting mechanism at the forward end of the stock, and intervening power transmitting connections between the piston rod or bar and the cutting mechanism whereby the latter is operated by the movement of the former, substantially as herein described.

3. In a shearing machine, the combination of the stock comprising the hollow communicating portions, and cylinder forming a space in which a store of air under pressure may be confined, the piston in the cylinder exposed on one side to the compressed air whereby it is moved by the expansion of the air, the rod or bar of the piston seated in the hollow forward portion of the stock, suitable cutting mechanism at the forward end of the stock, and intervening power transmitting connections between the piston rod or bar and the cutting mechanism whereby the latter is operated by the movement of the former, and means applied to the piston for forcing it to return whereby the confined air is restored to its initial compression, substantially as herein described.

4. A shearing machine consisting of a stock formed with the communicating hollow portions, and the interior cylinder communicating at one end with stock portions and having its other end open, the piston in the cylinder adapted to be moved back by the expansion of air confined under pressure in the hollow stock, and to be forced forward again by means inserted in the open end of the cylinder whereby the confined air is restored to its initial compression, suitable cutting mechanism carried by the stock and power transmitting mechanism from the piston to operate the cutting mechanism, substantially as herein described.

5. A shearing machine consisting of a stock formed with the communicating hollow portions, and the interior cylinder communicating at one end with stock portions and having its other end open, the piston in the cylinder adapted to be moved back by the expansion of air confined under pressure in the hollow stock, and to be forced forward again by means inserted in the open end of the cylinder whereby the confined air is restored to its initial compression, suitable cutting mechanism carried by the stock and power transmitting mechanism from the piston to operate the cutting mechanism, consisting of the rack bar of the piston, the shaft H with its pinion engaging the rack bar, the gear on the outer end of the shaft and the train of gears to the cutting mechanism, substantially as herein described.

6. In a shearing machine, the combination of the stock comprising the annular reservoir, the hollow front portion and the interior cylinder communicating at its forward end with the hollow front portion and with the annular reservoir and having its rear end apertured, said parts forming a space for confining air under pressure, the piston in the cylinder exposed on one side to the confined air whereby it is moved back by the expansion of the air, the rack bar of the piston in the hollow front portion of the stock, a rotary cutter-head with blades and a comb over which the blades work, located at the front of the stock, and power transmitting connections from the rack bar of the piston to drive the rotary cutter-head, substantially as herein described.

7. In a shearing machine, the combination of the stock comprising the annular reservoir, the hollow front portion and the interior cylinder communicating at its forward end with

the hollow front portion and with the annular reservoir and having its rear end apertured, said parts forming a space for confining air under pressure, the piston in the cylinder exposed on one side to the confined air whereby it is moved back by the expansion of the air, the rack bar of the piston in the hollow front portion of the stock, a rotary cutter-head with blades and a comb over which the blades work, located at the front of the stock, and power transmitting connections from the rack bar of the piston to drive the rotary cutter-head, consisting of the shaft H with its pinion and gear, and the train of gears to the cutter-head, substantially as herein described.

8. In a shearing machine, the combination of a stock having an internally threaded socket, the nut seated in said socket, the shaft having a collar bearing under the nut, a cutter head at the lower end of the shaft, the comb over which the cutter head plays, and the spring for lifting the shaft and keeping the pressure of the cutter head on the comb constant, substantially as herein described.

9. In a shearing machine, the combination of the comb, the rotating cutter head, the shaft of said head having a collar, an adjustable nut bearing on said collar, to press the cutter head upon the comb, and a spring tending to lift the shaft, to hold its collar against the nut substantially as herein described.

In witness whereof I have hereunto set my hand.

DAVID SAMUEL CHAMBERS.

Witnesses:
WM. F. BOOTH,
H. F. ASCHECK.