

D. M. SMYTH.

Feeding-Mechanisms for Sewing-Machines.

No. 151,801.

Patented June 9, 1874.

Fig. 1.

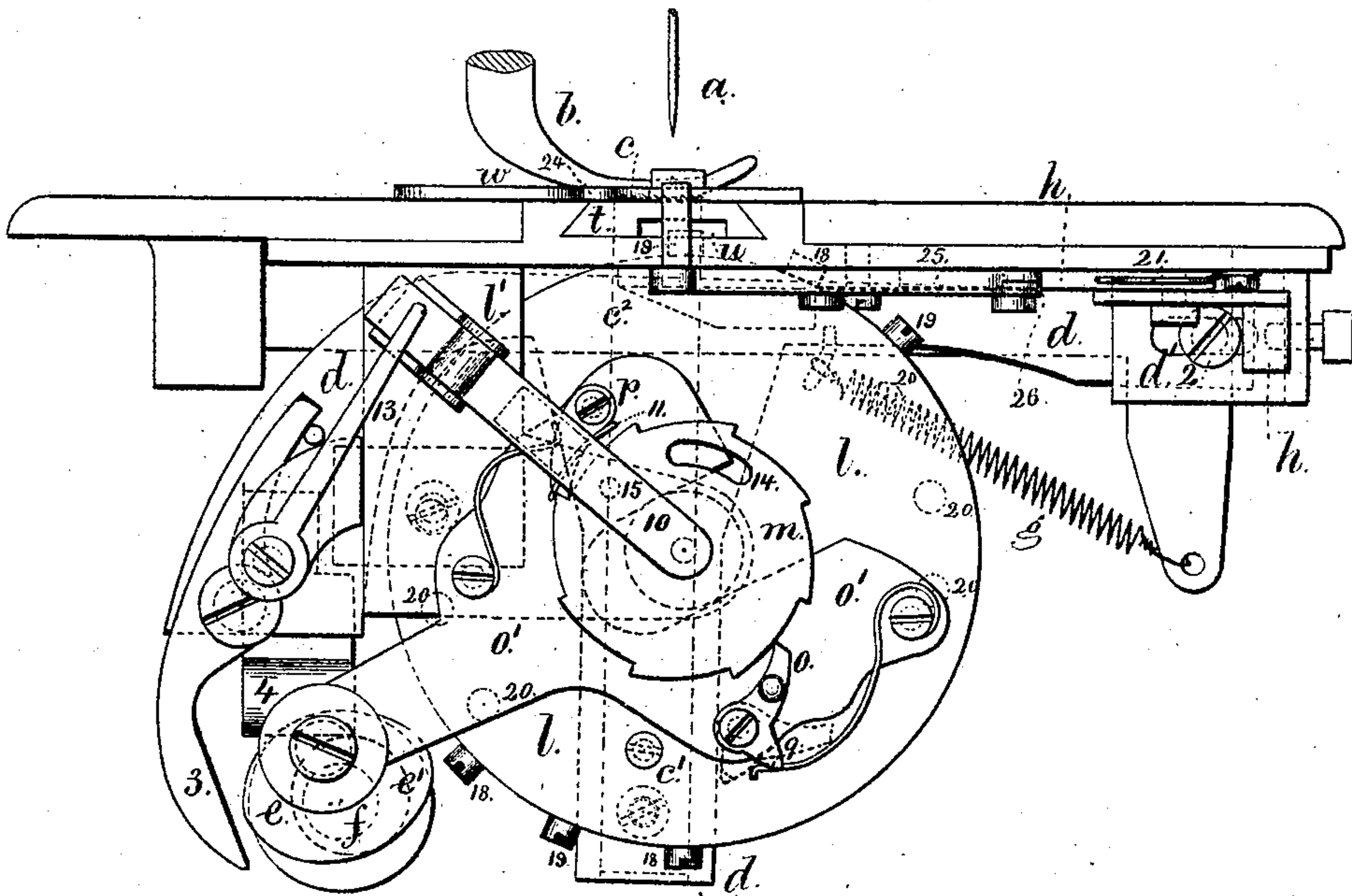


Fig. 2.

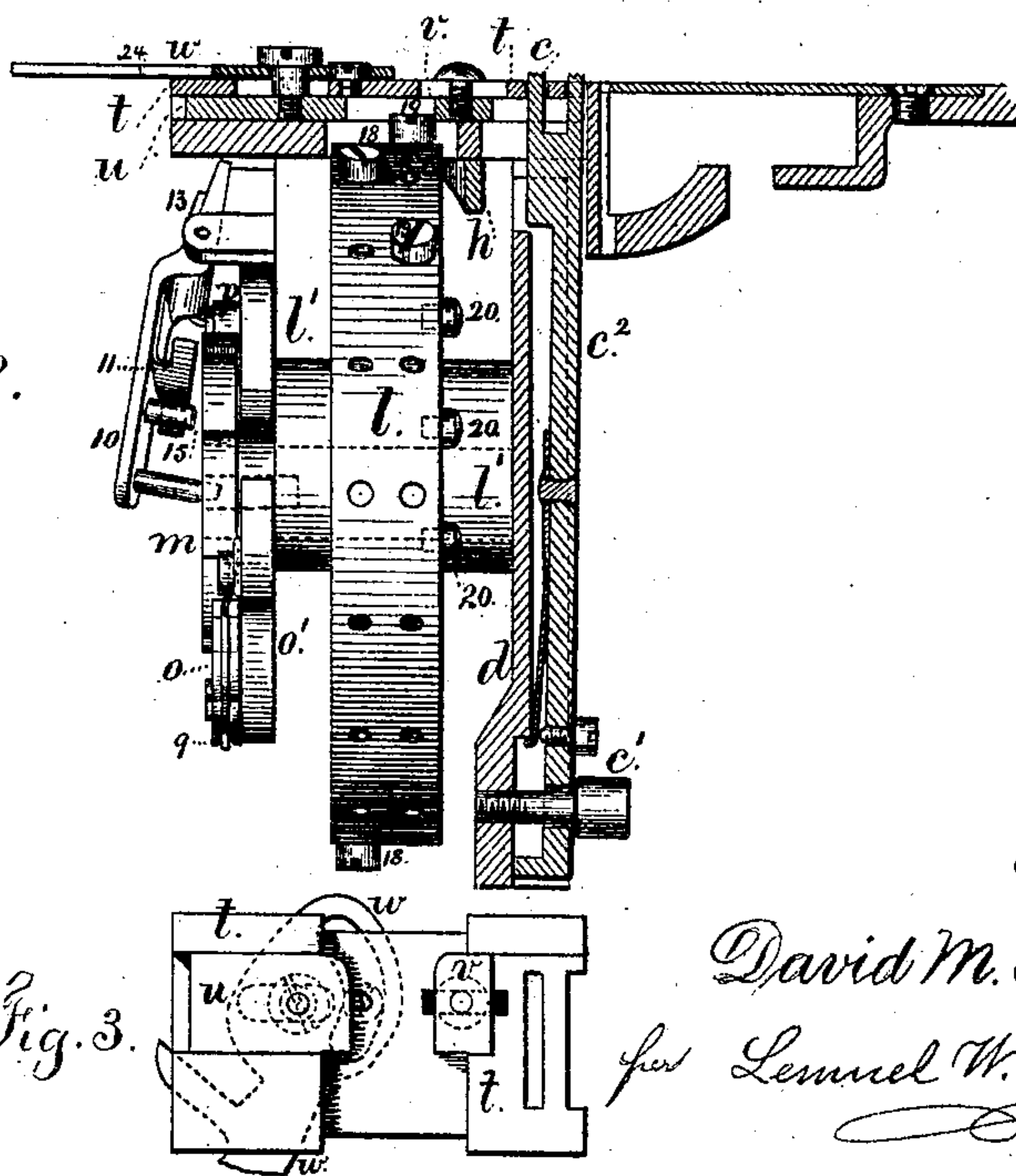
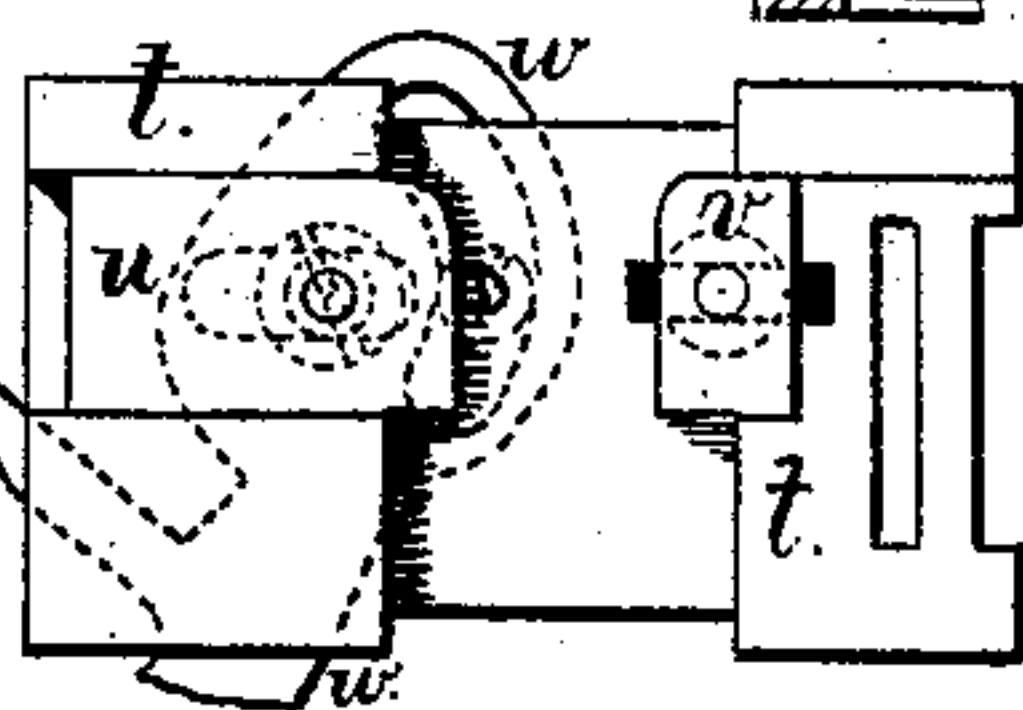


Fig. 3.



Witnesses,

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Geo. J. Prickney

Inventor

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per Lemuel W. Ferrell  
att'y.

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Fig. 5.

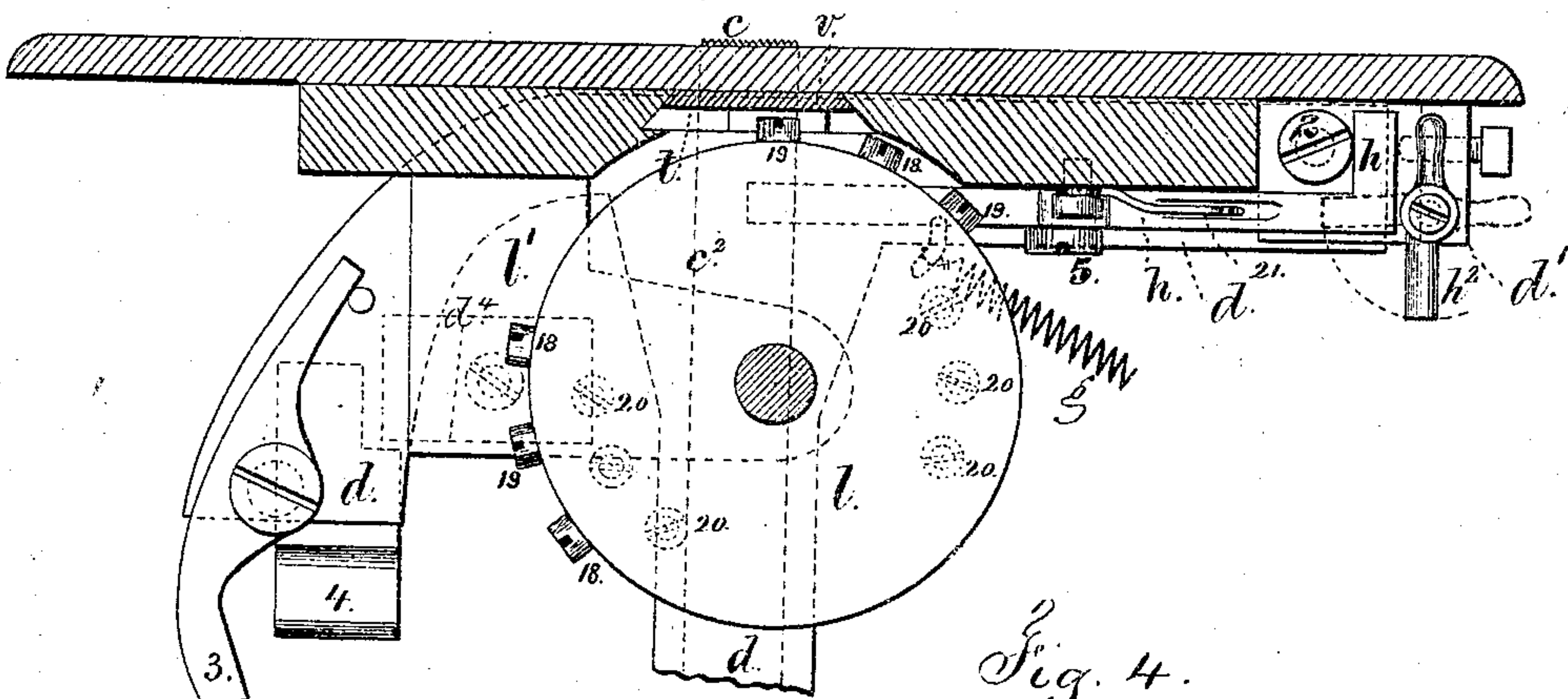


Fig. 4.

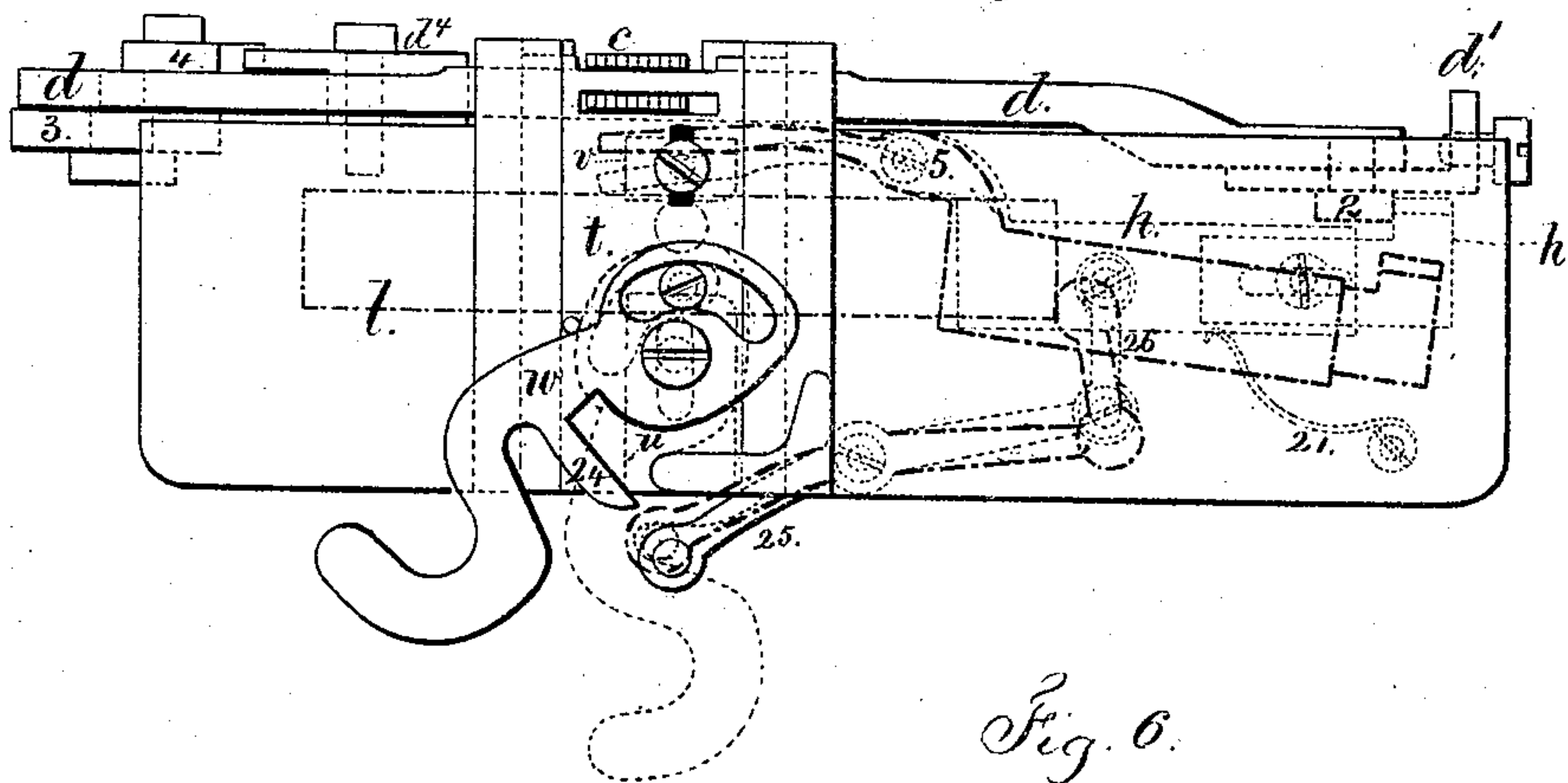
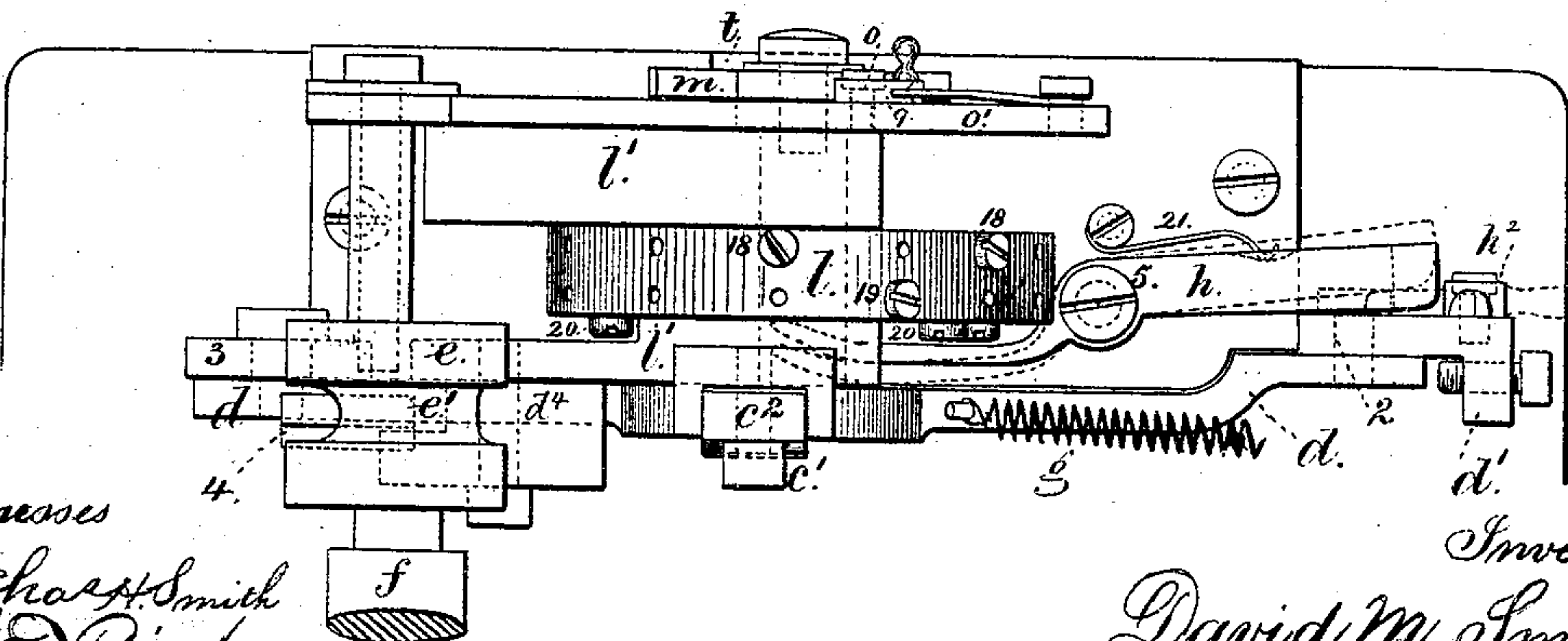


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN FEEDING MECHANISMS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **151,801**, dated June 9, 1874; application filed April 28, 1874.

*To all whom it may concern:*

Be it known that I, DAVID M. SMYTH, of Lynn, in the county of Essex and State of Massachusetts, have invented an Improvement in Feed-Motions for Sewing-Machines, of which the following is a specification:-

This invention is designed for ornamental, zigzag, or other pattern-sewing by automatic and variable means, so that the machine can easily be changed to produce one pattern or another of ornamental stitching. A wheel is employed that is revolved once by a step-by-step movement every eight, ten, or twelve stitches, more or less, and upon the periphery and upon one face there are holes at equal distances apart, and into these screws are inserted at positions adapted to produce the intended pattern. The screws upon the periphery move the feed laterally, either one way or the other, and the feeding bars or points are moved longitudinally in a frame acted upon by a continuously-revolving cam on the shaft of the machine, and in connection with this longitudinal feed there is a locking-out mechanism that prevents the feed-bar moving toward its cam, hence arresting the longitudinal feed, and this is effected by the screws at the side of the pattern-wheel. By this means the pattern will be set by changing the screws so as to make the lateral feed act either alone or in connection with the longitudinal feed, or in either direction, and to lock out of action the longitudinal feed when the lateral feed is operative, or not to actuate the lateral feed while the longitudinal feed is operative. I also provide a means for throwing the lateral feed out of action, and allowing the longitudinal feed only to operate.

In the drawing, Figure 1 is an elevation of the feeding mechanism. Fig. 2 is an elevation of the pattern-wheel and a section of the feed-bar. Fig. 3 is an inverted plan of the lateral-feeding slide. Fig. 4 is a plan of the feeding device, and of the secondary bed to which the parts are attached. Fig. 5 is an elevation of the feeding mechanism and section of the bed, and Fig. 6 is an inverted plan of the parts represented in Fig. 5.

The sewing mechanism is to be of any desired character, and is not shown herein, ex-

cept that *a* represents part of the needle, and *b* part of the presser-foot. The feed-bars or points *c c* are at the end of a vertical bar, *c*<sup>2</sup>, attached at *c*<sup>1</sup> within a frame, *d*, that slides at one end in the guide *d*<sup>1</sup>, to which it is connected by the screw 2 in a slot in *d*; and near the other end are the guides *d*<sup>4</sup>, that allow it to move freely up or down, or forward or back. The cam *e* upon the shaft *f* of the machine gives the bar-frame *d* the forward-and-back movement to produce the longitudinal feed, such cam acting upon the hooked end 3. A second cam, *e*<sup>1</sup>, behind *e*, acting below the flat end 4 of *d*, gives the up-and-down movement, to press the feeding-points *c* against the fabric or material, or draw the same away. The spring *g* keeps the frame *d* toward its operating-cams. When the lock-out latch *h*, that swings upon the fulcrum 5, is allowed to catch behind the screw 2, the finger 3 is held away from the cam *e*, so that the longitudinal feed will not be operative. The pattern-wheel *l* is sustained by a shaft passing through the hanging bracket *l*<sup>1</sup>, and at the end is a ratchet-wheel, *m*, and *o* and *p* are pawls for this ratchet-wheel. They are upon the pawl-plate *o*<sup>1</sup>, that is moved by a crank-pin. The pawl *o* has a projection, 9, for a spring to act against, that the pawl can be thrown back out of action by moving the projection sufficiently to bring it against the other portion of the incline of the spring, and in this way the rotation of the pattern-wheel *l* can be stopped at the will of the operator. The pawl *p* can also be thrown out of action by the swinging arm 10, that carries a shield, 11, to enter between the pawl and ratchet-wheel. In the normal position, Figs. 1 and 2, this arm 10 is held out of the way of the pawl *p* by the spring 13; but when the moving end of this spring is thrown on the other side of the fulcrum of the arm 10, said arm is pressed toward the ratchet-wheel; and when the hole 14 in said wheel *m* arrives behind a pin, 15, on said arm 10, then said arm will be moved by the spring 13, and the ratchet *p* thrown out of action. This hole 14 determines the point at which the pattern-stitching is stopped, so that straight sewing may be started from a given point in the pattern-sewing. The position of the pawls



is such that the ratchet-wheel will be moved around the extent of half a tooth by one pawl, and the other half tooth by the other pawl, making sixteen pauses with eight ratchet-teeth, for an object hereafter named. The feed-bars *c* or teeth are in longitudinal slots in the feeding-slide *t*, and this slide is capable of endwise movement, to give the feeding-points motion laterally. Upon the under side of the slide *t* are projections *u* and *v*. It is preferable that they be attached by slots and screws, so that they may be adjusted. I have shown the projection *u* as fitted to move endwise in the slide *t*, by the action of a cam piece or plate, *w*, so that the distance between *u* and *v* may be changed at the will of the operator, and in so doing the length of lateral movement of the feeding bars or points *c* will be varied, and the stitches be larger or smaller.

It will now be evident that the movable screws 18 in the pattern-wheel, acting against the stop *u*, move the feed laterally in one direction, and the screws 19, acting against the stop *v*, move the feed laterally in the other direction, and according to the positions of these screws, so the movement will take place at the time the feed-points are raised, or when they are depressed, the motion in one direction being a return movement, and in the other direction an operative feed movement.

If this lateral feed operates when the longitudinal feed is operative, the movement of the fabric will be diagonally in either one direction or the other. If the screws 18 and 19 are omitted in the pattern-wheel for one or more stitches, then the longitudinal feed only will be operative, and if the longitudinal feed is locked out of action by the locking-lever *h*, then the lateral feed only will operate.

It will be apparent that the screws 20 on the side of the pattern-wheel *l* keep the spring 21 from throwing the lock-lever *h* back to the screw 2, except when the screws are omitted.

The screw-holes should be numbered, and

the operator can keep a record of the numbers of the holes into which screws are to be inserted in producing a given pattern. By turning the cam-plate *w* around sufficiently to open the space between *v* and *u*, and make it wide enough for the screws 18 and 19 to pass between them without touching, the lateral feed will be thrown out of action. I prefer at the same time to hold the locking-lever *h* back out of action by the finger 24 on the plate *w*, that moves the lever 25, link 26, and locking-lever *h* to the position shown by dotted lines in Fig. 4.

When the pawl *o* is thrown back, as shown by dotted lines in Fig. 1, the locking-lever *h* can be held back out of action by the wedge-block *h*<sup>2</sup>, turned in between the feed-bar *d* and lever *h*, thereby preventing the spring 21 forcing the lever behind the screw 2, and locking the said feed-bar out of action. This wedge-block *h*<sup>2</sup> will take the place of the lever 25 and link 26, and dispense with the cam-plate *w* and finger 24 upon the surface of the bed.

I claim as my invention—

1. The locking-out lever *h*, combined with the lateral-feeding mechanism, and the feed-bar and longitudinal-feeding mechanism, and the movable screws or pins upon the pattern-wheel, substantially as set forth.

2. The movable cam-plate *w*, in combination with the stops *u v* and pattern-cam for adjusting the length of lateral stitches, substantially as set forth.

3. The swinging pawl *o* on the pawl-plate, constructed with a projection for the spring, in combination with the ratchet-wheel *m*, pattern cam or wheel *l*, and lateral-feeding mechanism, substantially as set forth, to throw that mechanism out of action by turning back the pawl, as set forth.

Signed by me this 22d day of April, 1874.

Witnesses:

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GEO. O. CURRIER.