

S. M. TYLER.  
Sewing Machine.

No. 58,181.

Patented Sept. 18, 1866.

Fig: 2.

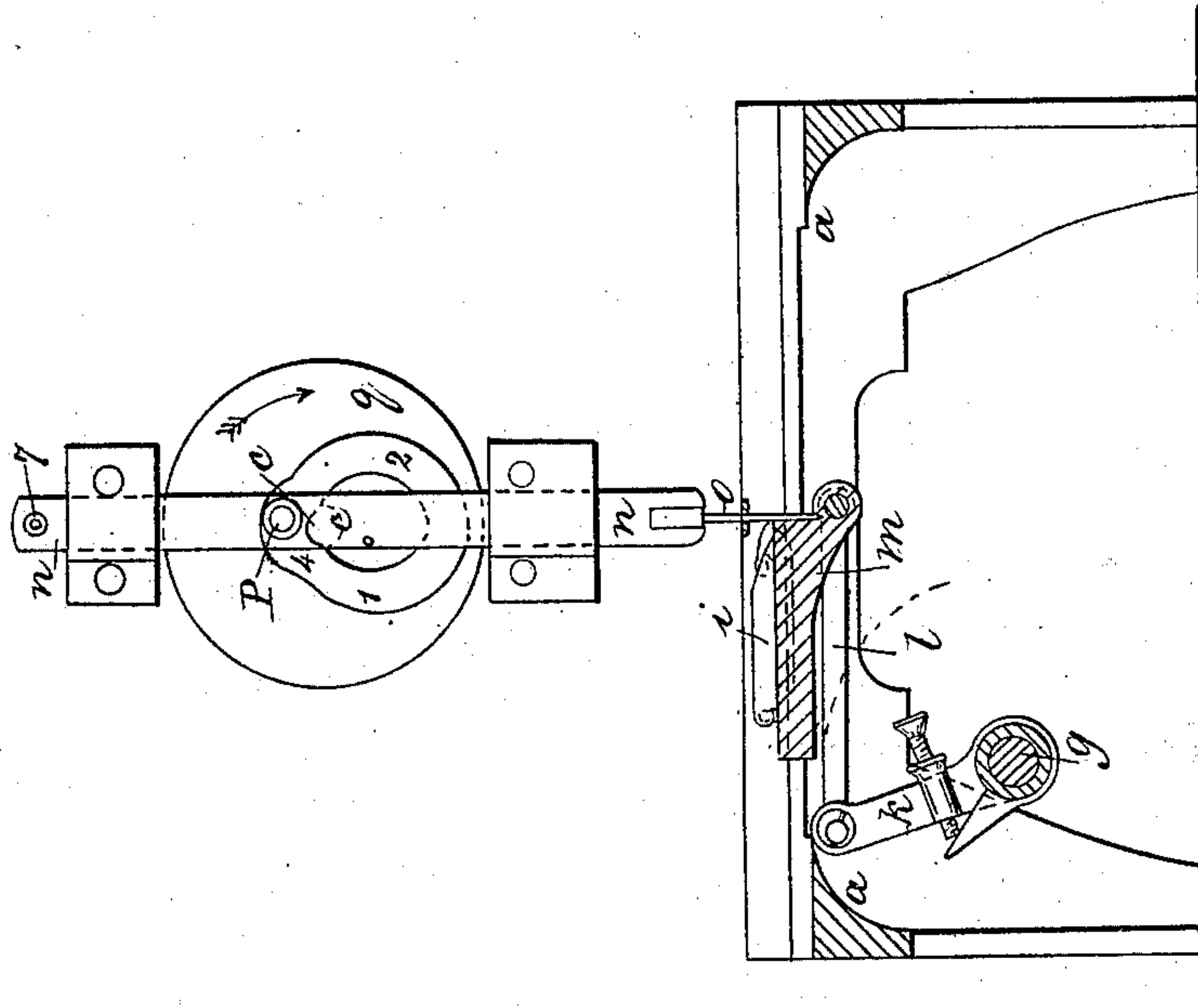


Fig: 1.

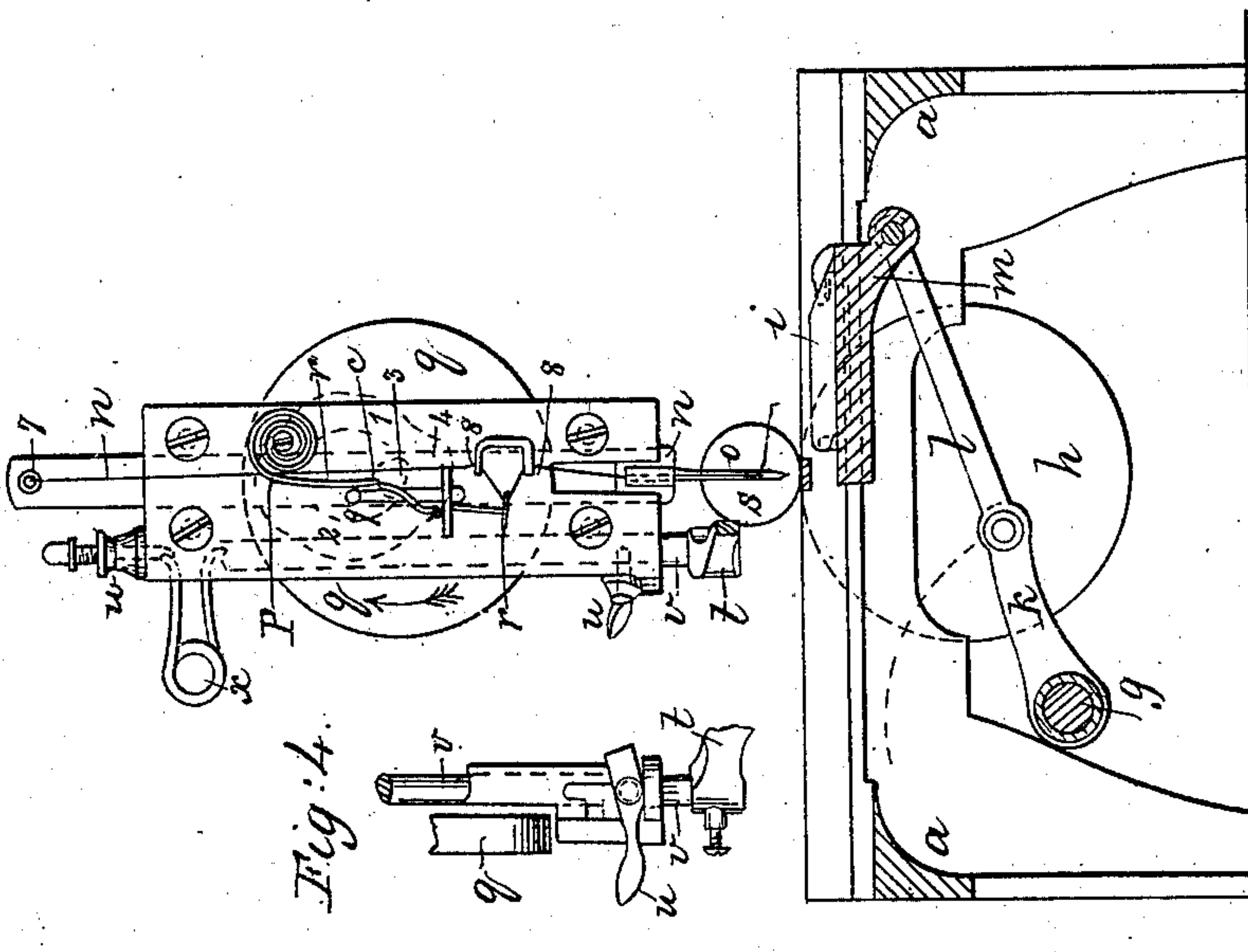
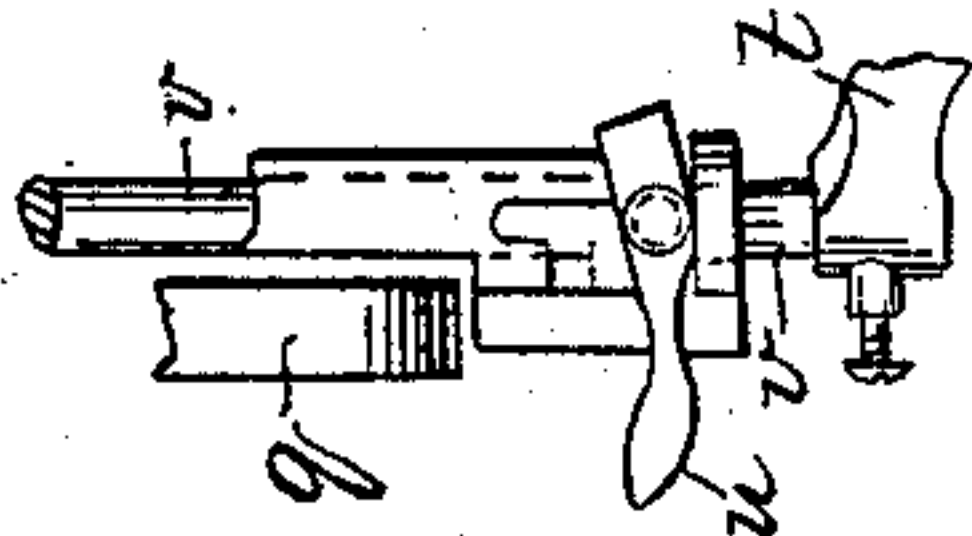


Fig: 4.



Witnesses.  
Charles Smith  
Geo D. Walker

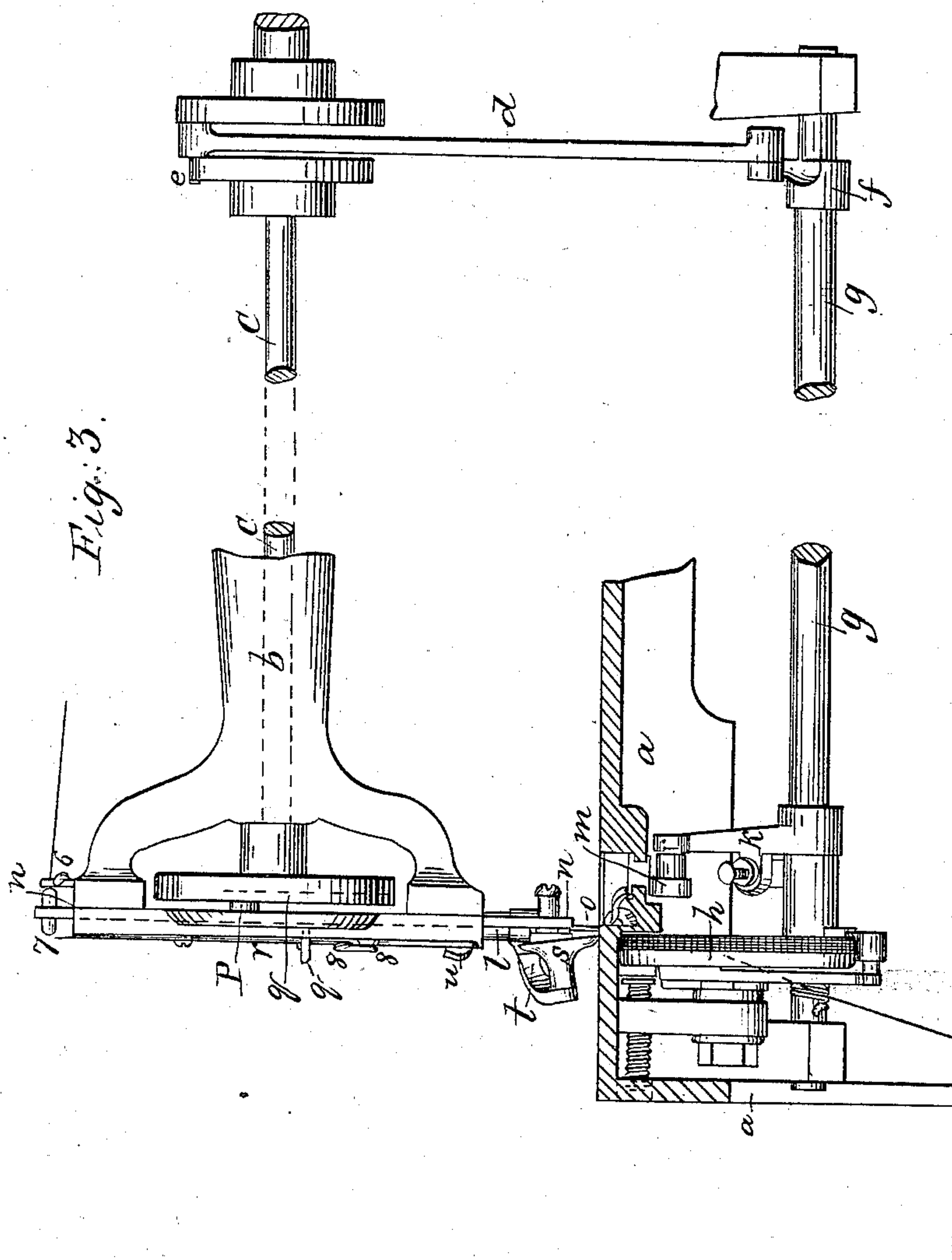
Inventor.  
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2 Sheets—Sheet 2.

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Chas. A. Smith,  
Geo. J. Walker

Inventor  
S. M. Tyler



# UNITED STATES PATENT OFFICE.

SIDNEY M. TYLER, OF BROOKLYN, ASSIGNOR TO THE EMPIRE SEWING MACHINE COMPANY, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 58,181, dated September 18, 1866.

*To all whom it may concern:*

Be it known that I, SIDNEY M. TYLER, of Brooklyn, in the county of Kings and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a front view of the head and needle-bar, the bed of the machine being in section, and the feed-wheels shown by red lines, the needle being up. Fig. 2 is a similar view, the needle being at its extreme downward movement, and the cap over the needle-bar being removed to show the actuating-cam; and Fig. 3 is a side view of the head carrying the needle-bar, and an elevation of the feed-wheel and mechanism, the bed of the machine being in section, and only a portion thereof and of the arm being shown.

The object of my present invention is to give to the shuttle a slow movement and gradual stop at the time the needle is out of the cloth and the stitch is tightened, and a rapid movement at the other end of its motion, the one preventing inequality in the drawing up of the stitch and the breaking of either thread, and the other or rapid movement passing the shuttle quickly through the loop of the needle-thread, so that there may be no detention to the drawing up of the needle.

I effect these objects by a crank upon a rock-shaft and a link to the shuttle-driver, so that the straightening of the crank and link gradually stops the shuttle at the same time that the needle receives differential movements from a revolving cam, the form of which is such as to give a rapid movement to the needle while rising, and again descending, but a slow movement to the needle, or a complete pause, while the shuttle is passing through the loop of needle-thread.

By these movements I am enabled to effect sewing of a superior quality with very little wear upon the thread, and the movements are almost noiseless, and the parts do not wear loose as rapidly as in machines in which heavier parts are required than in mine.

In the drawings, *a* is the bed of the machine,

from which the usual arm rises, the end of which is seen at *b*. *c* is the main shaft, rotated by competent power, and mounted within the arm in any convenient manner. *d* is a link or connecting-rod from a crank, *e*, on the shaft *c* to an arm, *f*, on the rock-shaft *g*, which crank-rod and arm give to said shaft *g* the rocking movement required at the proper time. *h* is the feed-wheel, actuated from the shaft *g* by suitable means, which, not forming part of the present invention, need not be further described.

Upon the rock-shaft *g* is a crank-arm, *k*, with a link, *l*, which connects it to the shuttle-driver *m*, that slides in ways in the bed *a* and propels the shuttle *i*.

The needle-bar *n* and needle *o* are fitted to slide at the end of the arm *b* in a head provided for that purpose, and upon the back of the needle-bar is a roller, *p*, taking a cam-groove in the disk *q*. The shape of this cam-groove in *q* is shown in Figs. 1 and 2, and is such that the needle moves rapidly out of the cloth by the action of the part 1 of such groove, and then again moves rapidly into the fabric by the action of the part 2 of the said groove. The projection at 3 causes the needle to rise sufficiently to form a loop in its thread below the cloth, and then the needle remains stationary, or nearly so, while the shuttle passes into and partially through the loop of needle-thread, the part 4 of such groove allowing this pause in the needle's movement.

The result of these combined movements of the needle and shuttle is that the stitches are pulled up with great uniformity, because the shuttle is moving slowly as the crank and link straighten, so as to give time for the needle-thread to be drawn up, and the gradual stoppage of the shuttle prevents its momentum injuriously affecting the thread or stitch, whereas if the shuttle-driver were suddenly stopped the momentum of the shuttle, in consequence of the play or end motion necessarily allowed between the shuttle and driver, would be arrested only by the tension of the thread, and is, in many instances, a fruitful source of uneven sewing and breaking of thread.

The needle-thread passes from a spool through any desired tension apparatus to the eye 6 on the head *b*, thence through the pipe 7 on the



upper end of the needle-bar, and descends behind a wire loop or guide, *8 8*, to an eye-guide at the needle-shank, and thence through the eye of the needle *o*. Between the ends of the loop or guide *8 8* a spring take-up, *r*, is applied, over the hook of which the thread passes.

A pin, *9*, projects from the needle-bar *n* through a slot in its cap and takes against a bend in the spring-arm of the take-up *r* at the time that the needle is in the cloth, so as to prevent the spring take-up drawing the loop of needle-thread while the shuttle is passing through the same; but as soon as the needle and its bar *n* are raised this pin *9*, passing above the spring take-up *r*, allows that to operate in keeping the needle-thread under proper tension and clear of the needle-point.

The pressure-foot is formed by a roller, *s*, on an arm, *t*, that can be raised vertically by the lever *u*, and afterward swung aside to facilitate the threading of the needle and the placing of the fabric.

The slot in which the connection between the bar *v* and the lever *u* swings is more clearly shown in Fig. 4. The bar *v* is round, and extends up through the head at the end of the arm *b*, and above said bar is an adjusting-screw and set-nut, *w*. *x* is a spring, with its ends turned up to enter cavities in the upper end of the bar *v* and lower end of the screw *w*, so as to give pressure on the article to be sewed. This construction allows the pressure-foot or pressure-roller at the lower end of the round bar *v* to be raised up and turned around, as required, and also allows the pressure of the foot to be adjusted with facility by the screw *w*.

I am aware that a cam has been employed for giving motion to the needle-bar, and that a shuttle-driver has been connected to the crank-arm by a link; but these two devices have not been employed in the same machine, and the arrangement of the shuttle-driver, link, and crank has been such that the shuttle, when its point was going forward and the stitch being drawn up, was actuated by the

link and crank in a position nearly at right angles to each other, hence variations are apt to arise in the exact point to which the shuttle is moved and the extent to which the stitch is tightened, according to the momentum of the parts; and if the cam or connections moving the rock-shaft wear loose the stitch cannot be drawn up with uniformity.

By my arrangement of the crank, link and driver, the shuttle must be moved to a definite position and stopped by a gradual movement, because the crank-arm and the link to the driver move until the centers come on a straight line; hence the shuttle is moved to a certain point and stopped at that point at every stitch, whether the rock-shaft and crank, through wear or lack of adjustment, should move beyond the straight line with the link or not; and the shuttle being stopped gradually, by the crank and link describing arcs of circles, (touching, but not intersecting each other,) greatly aids in producing uniformity of sewing, and lessens the liability of the threads to break. These movements given to the shuttle, being combined with the movements given to the needle by the cam, are easily timed, so that the needle reaches its extreme upward movement simultaneous with the shuttle's extreme horizontal motion, thus insuring the correct tightening of the stitch.

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

The rocking shaft *g*, crank *k*, link *l*, and shuttle-driver *m*, arranged and acting on the shuttle in the manner specified, in combination with the needle-bar *n* and cam *q*, for giving the specified motions to the needle, as and for the purposes set forth.

In witness whereof I have hereunto set my signature this 9th day of June, A. D. 1866.

S. M. TYLER.

Witnesses:

CHAS. H. SMITH,  
GEO. D. WALKER.