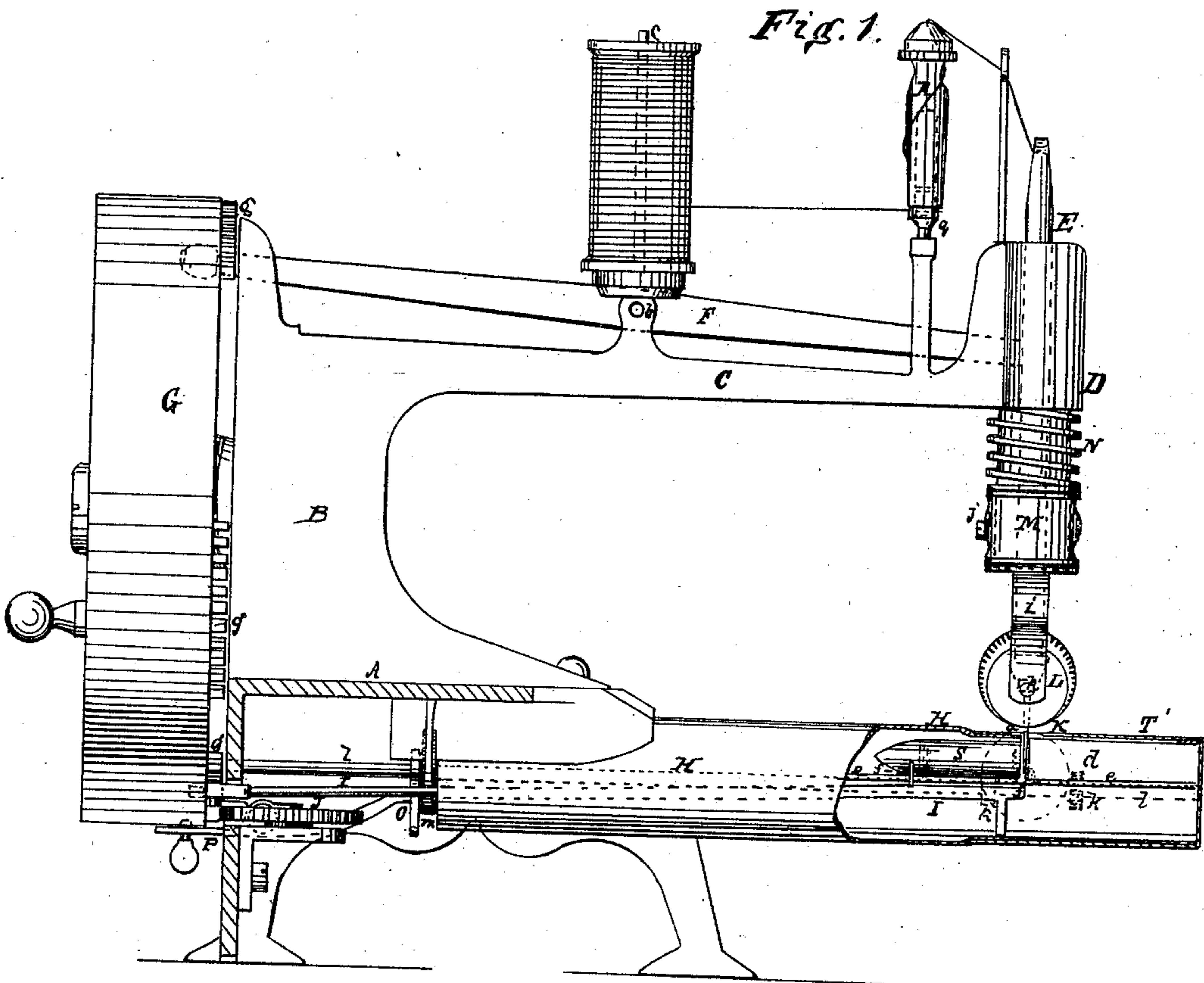


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SEWING MACHINE.

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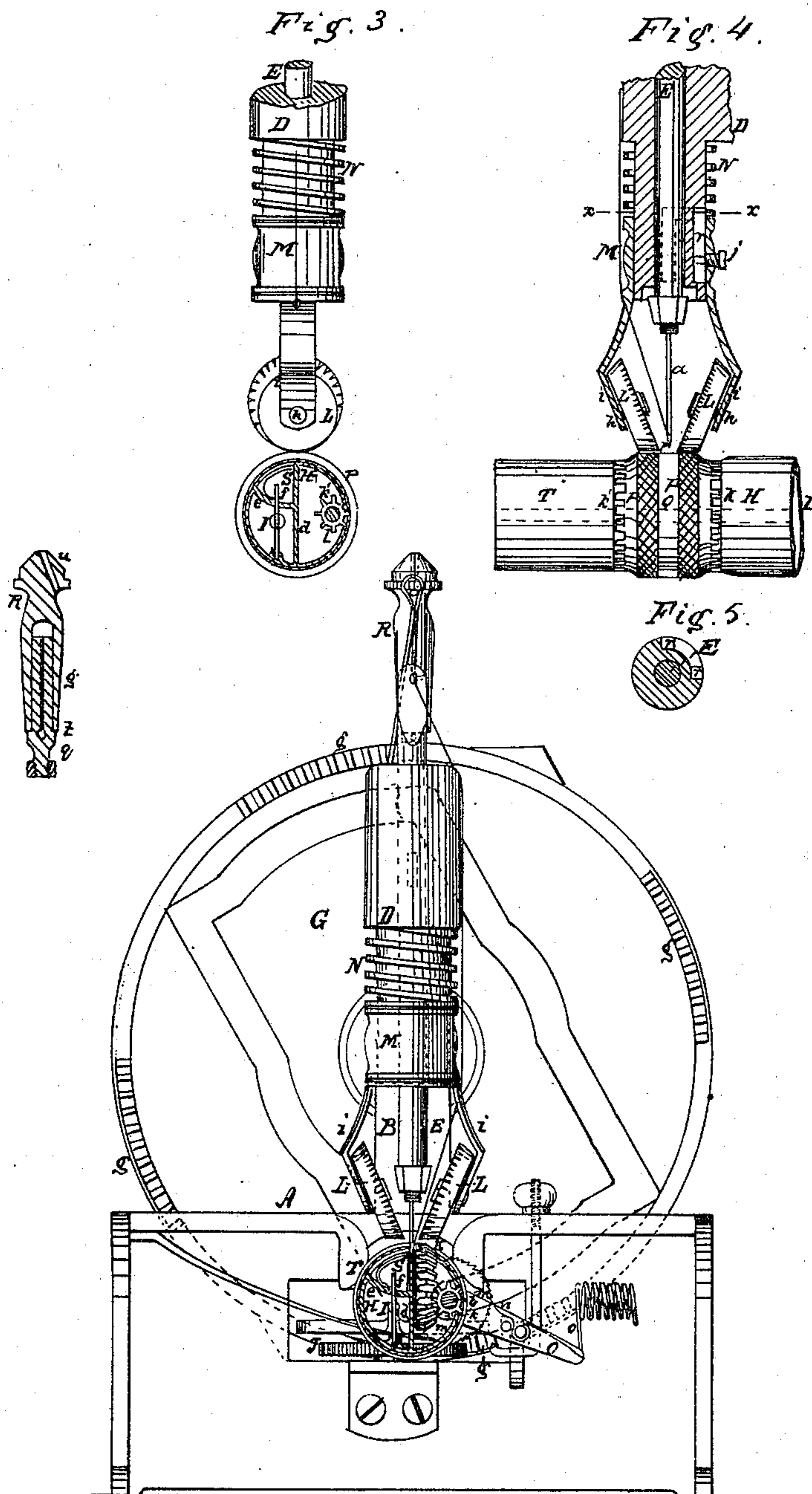
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# UNITED STATES PATENT OFFICE.

M. W. STEVENS AND E. G. KINSLEY, OF STOUGHTON, MASSACHUSETTS.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 10,994, dated May 30, 1854.

*To all whom it may concern:*

Be it known that we, MARTIN W. STEVENS and EDWARD G. KINSLEY, of Stoughton, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a machine constructed according to our invention, parts of the framing being broken away to show the working parts. Fig. 2 is a front elevation of the same with the end of the cylinder in which the shuttle works cut away to show the interior. Fig. 3 is a front view, partly sectional, of a modification of the feed movement and surrounding parts. Fig. 4 is a side view, partly sectional, of the devices shown in Fig. 3. Fig. 5 is a section in the line *xx* of the socket through which the needle-rod works. Fig. 6 is a vertical section of the device for regulating the tension on the thread.

Similar letters of reference indicate corresponding parts in the several figures.

The sewing-machine to which these improvements relate forms the seam in a well-known manner by passing one thread through the cloth or other material with a needle in a series of loops, and by passing another thread with a shuttle through the said loops to prevent their return through the cloth. The shuttle and the feed-motion are arranged to work within a cylinder for the purpose of sewing boot-legs and other articles of circular form which can be placed around the said cylinder.

The first part of our invention has for its object the sewing of the seams which run lengthwise in boot-legs and other articles of cylindrical form; and it consists in feeding the article to be sewed longitudinally upon the cylinder for that purpose.

The second part of our invention relates to the employment of pressure-rollers to hold the material to be sewed in close contact with the feeding-cultivators. Our machine is furnished with two feed-motions—viz., one to feed around and the other to feed along the cylinder; and the same pressure-rollers arranged to run in one direction only would not

serve to feed in both directions. In order to provide for feeding in both directions, the nature of this part of our invention consists in a certain method of arranging and applying the rollers, so that their position may be changed for feeding in either direction.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

The whole of the working parts of the machine are supported by a table, A, (see Figs. 1 and 2,) from the center of which rises a standard, B, having an arm, C, which extends forward to a considerable length, and has a socket, D, at its forward end, forming a guide for the needle-rod E. The needle-rod carries the needle *a* at its lower end, and receives a vertical rectilinear motion by means of a lever, E, of the first order, which has its fulcrum on a pin, *b*, above the arm *c*, and is moved by a roller at its back end running in a groove in the face of the driving-wheel G, which is fitted to turn loosely on a fixed axis at the back of the standard B, and receives a constant rotary motion by hand or other means. The spool which supplies the needle with thread is placed upon a spindle, *c*, at the top of the arm C. The shuttle works longitudinally in a cylinder or tube, H, which is secured to the under side of the table A, and projects horizontally therefrom under the arm C to a distance in front of the needle *a*, under which it is central. This tube is divided for some distance back from its front end by a vertical central partition, *d*, (see Figs. 2 and 3,) and on the left on this partition there is a horizontal shelf, *e*, extending to the side, which forms the shuttle-race. The shuttle receives its motion through a rod, I, which works through that part of the tube below the race, and has two picker-fingers, *f f*, protruding through a slot in the race, the said rod receiving its motion through a stud on the face of a horizontal toothed wheel, J, which turns on a suitable vertical axis below the table, the said toothed wheel receiving an intermittent rotary motion from segments of toothed gearing *g g* on the face of the driving-wheel G. The groove in the face of the driving-wheel causes the needle to make two perforations of the cloth during every revolution of the wheel. Consequently the shuttle requires to make two movements back and forth during the same time. The shuttle requires to remain sta-

tionary for a short time after each movement; and in order to give the shuttle the proper movements and rests, there must be four segments of gearing *g g*, each one bearing a proper relation to the toothed wheel *J*, to cause it to make half a revolution as it gears in passing. One segment will then give the wheel *J* the necessary movement—viz., half a revolution—to drive the shuttle forward. Then the space between the segments will allow the wheel to remain stationary until the next segment comes in gear and gives the wheel another half-revolution to bring the shuttle back. While the next space passes the wheel *J* it is stationary; but as the next segment comes in gear it will commence causing a repetition of the above-described movements. The shuttle *S* has its point at its back end, and hence must pass through the loop protruded through the cloth or material by the needle as it moves backward. The relative operations of the needle and shuttle in forming the stitch being the same in this as in many other machines need no further description.

The material or article to be sewed passes over, around, or along the cylinder *H*, and the machine is provided with two feed-motions—one for feeding longitudinally to the cylinder, and the other for feeding transversely to or around the same. The first of these motions is shown in Figs. 1 and 2, in which *K* represents the roller by which the material or article is moved, the said roller turning freely on a horizontal axis placed transversely to the cylinder *H*, within which the roller works close to the right side of the central partition, *d*, with the upper part of its periphery slightly protruding through an opening in the top of the cylinder. The material or article is confined to the feed-roller *K* by one of two rollers, *L L*, which are hung to turn freely on axes *h h* in ears *i i*, which are attached below or form part of a collar, *M*, which is fitted to slide freely up and down the lower part of the needle-rod guide *D*. This collar is prevented turning on the cylindrical part of the guide *D*, to which it fits, by a screw or pin, *j*, whose point protrudes through the inside of the collar into a groove, *r*, made longitudinally in the guide. The collar *M* is forced downward by a spiral spring, *N*, which surrounds the guide *D* above it, and the roller *L* is thus made to bear upon the feed-roller *K* with sufficient force to prevent the possibility of the escape of the material or article from it, and as the feed-roller turns, the roller *L* turns also by reason of the friction of the material on its periphery, allowing the material to move without interruption. The feed-roller receives its motion through a series of teeth on one face, which constitute a gear gearing with a pinion, *k*, on a small shaft, *l*, one end of which works in a bearing in the front end of the cylinder *H*, and the other in a bearing at the back of the table *A*. This shaft *l* carries a ratchet-wheel, *m*, near its back end, through which it receives an intermittent motion at

suitable intervals by means substantially similar to those employed in some other sewing machines for actuating the feed-motion, consisting of a lever, *O*, fitted loosely to the shaft and carrying a pawl, *n*, which engages with the teeth of the ratchet-wheel, the said lever being moved upward to turn the ratchet by another lever, *P*, which works at right angles to it, the latter lever being operated upon at suitable intervals to work the feed by projecting pieces on the periphery of the driving-wheel, and the former lever being moved downward to allow its pawl to pass the required distance over the ratchet-wheel by a spring, *o*, bearing upon its end.

The other feed-motion is shown in Figs. 3 and 4, in which *P P* represent two rings, by which the material or article is moved. These rings are fitted to turn freely on the cylinder *H*, one in front and the other at the back of the needle, and each ring is furnished on the edge which is farthest from the other ring with a series of teeth extending all round, the teeth of one of these rings gearing with the pinion *k*, which has already been described as driving the feed-roller *K*, and those of the other ring gearing with a pinion, *k'*, on the same shaft, *l*, the said pinions having one side of their peripheries protruding through openings in the side of the cylinder. Between the two rings *P P* is placed a ring, *g*, which fits tightly to the cylinder and is prevented from revolving by any suitable means. This ring is perforated with a hole, *p*, at the top to allow the needle to pass through. When this feed-motion is used, the collar *M* is turned to a position at right angles to that which it occupies when the first-described motion is used, and to allow of this two grooves have to be made in the guide *D*—one for each position of the screw or pin *j*. In order to save the trouble of withdrawing the screw or pin, the upper ends of the grooves *r r* are connected by a groove extending round from one to the other, so that by raising the collar high enough it may be turned to change the screw or pin from one groove to the other. This may be understood by reference to Fig. 5, which is a section of the guide taken through the connecting-groove. The position of the collar shown in Figs. 3 and 4 brings the rollers *L L* immediately over the feed-rollers *P P*, and they act in the same manner as upon the other feed-roller, *K*. The peripheries of all the rollers should be burred or made rough to hold the cloth or material. In consequence of the openings which it is necessary to make near the front end of the cylinder *H* for the insertion of the shuttle and the feed-wheel *K*, we cover the front part with a cap which slides over the end. When the circular feed is used, we only require a short cap, *T*, reaching up to the first feed-ring; but when the longitudinal or straight feed is used, we employ a longer cap, *T'*.

The cylinder or tube *H* may be made small enough to sew very small articles of circular form, and when made as small as we consider

desirable for many purposes, sufficient room for the movement of the shuttle in any other way than that we have shown could not be obtained. In sewing lengthwise on any article of circular form, as in stitching up the sides of boot-legs, we use the first-described feed-motion; but in sewing around such articles we use that last described. The last-described feed-motion operates in a manner very materially different from any we know of in feeding at right angles to the motion described by the shuttle in passing through the loop, by which means a much better and neater seam can be made than in any other machine. This is owing to the shuttle-thread passing transversely through the loop and remaining in the same position while the latter is being drawn tight.

The device we employ for tightening or regulating the tension of the needle-thread consists of a thimble or cap, R, which fits to a pivot, *q*, secured in the arm C, the said pivot being made sufficiently elastic by a longitudinal slit, *s*, (see Fig. 6,) to prevent the thimble turning without considerable force. A hole, *t*, is made through the lower part of the pivot below the thimble, and another hole, *u*, passes from the top of the thimble through one side. The thread from the spool passes through the hole *t*, and from thence through the hole *u* to

the hole in the top of the needle-rod, and may be more or less coiled upon the thimble by turning the latter upon its pivot. When little or no coil is given to the thread, the tension is slight; but as the coil is increased the tension is increased.

Having thus fully described our invention, we will proceed to state what we claim and desire to secure by Letters Patent.

1. When the shuttle and feed-motion are arranged within a cylinder upon or around which the work is placed, so arranging and operating the feed-motion as to move the work longitudinally to the cylinder, substantially as described, in order that longitudinal seams may be made in articles of circular form.

2. Attaching the pressure-rollers L L to a collar, M, which fits to a portion of the needle-rod guide D, or other suitable fixed part of the machine, in such a way, substantially as described, that they may be turned and readily secured to run either longitudinally or transversely to the cylinder or bed upon which the work is placed.

M. W. STEVENS.  
E. G. KINSLEY.

Witnesses:

GEO. A. WELD,  
BRADFORD KINSLEY.