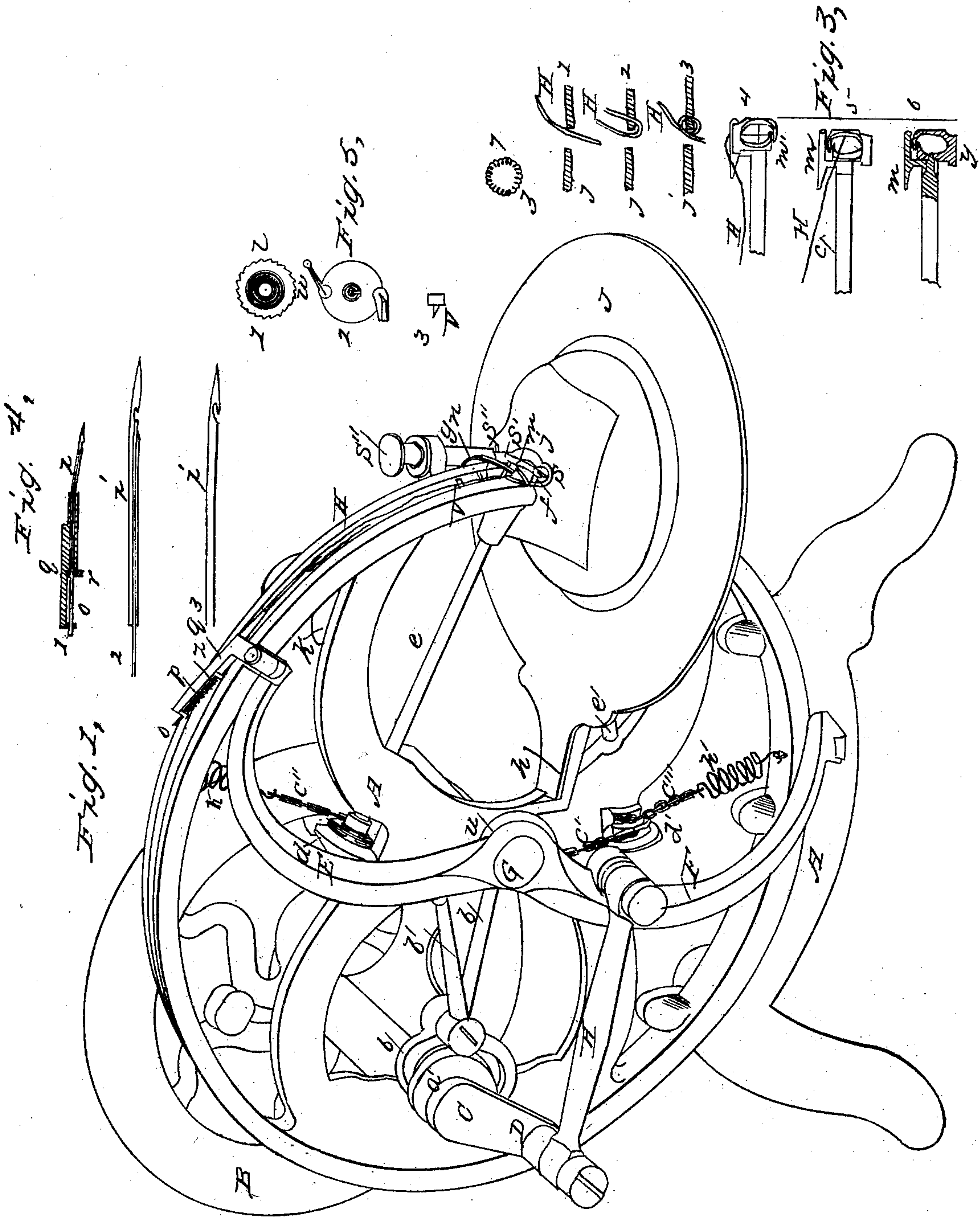


2 Sheets—Sheet 1.

S. H. ROPER.
Sewing Machine.

No. 16,026.

Patented Nov. 4, 1856.

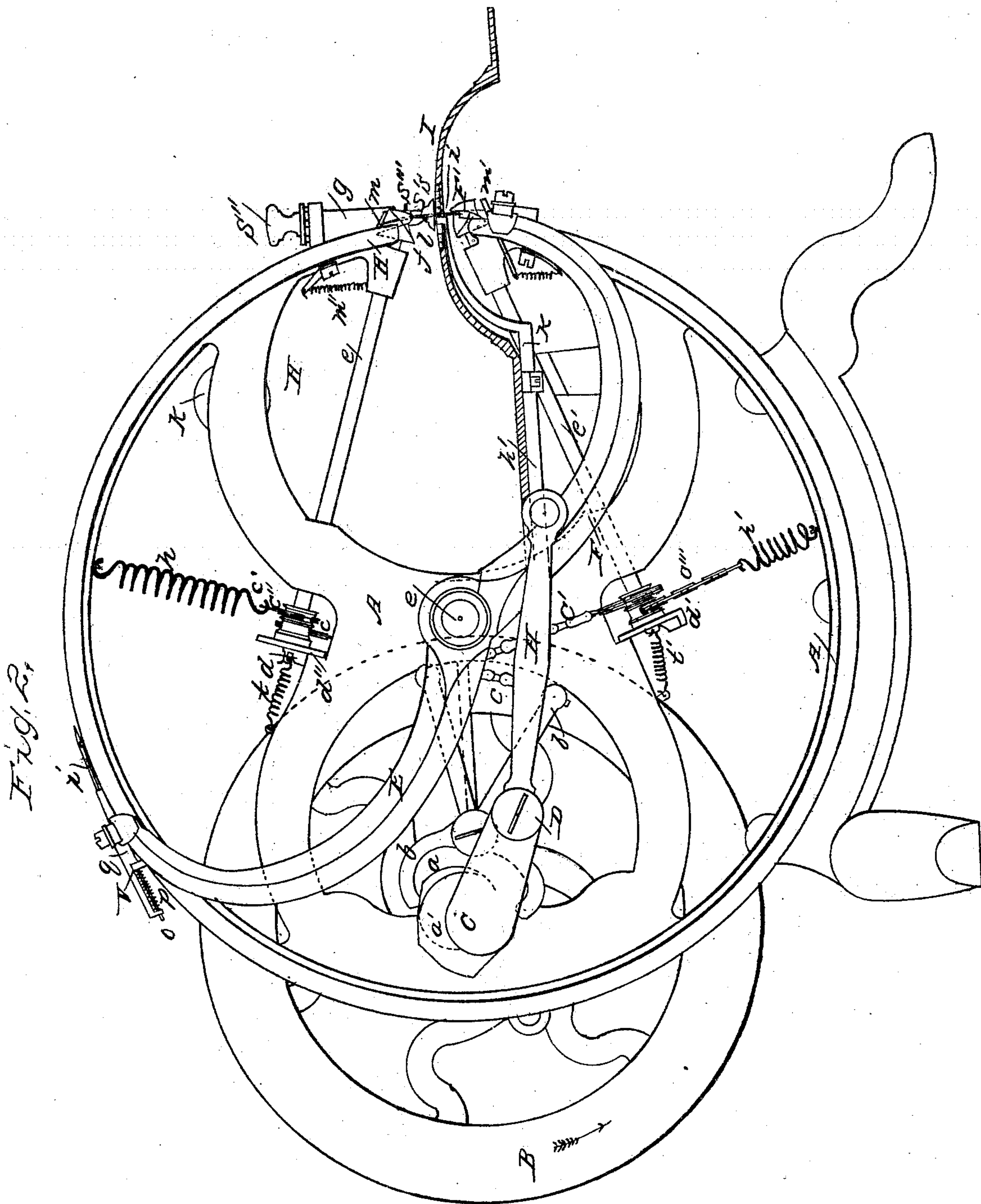


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UNITED STATES PATENT OFFICE.

S. H. ROPER, OF ROXBURY, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 16,026, dated November 4, 1856.

To all whom it may concern:

Be it known that I, S. H. ROPER, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement on the Sewing-Machine, more especially of Robinson's patent; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view; Fig. 2, a longitudinal or side elevation, showing also a section of the table. Fig. 3 shows the thread-guides in the several positions which they occupy while guiding the thread into the eye of the needle. It also shows the stitch. Fig. 4 represents the different parts of the needle on an enlarged scale. Fig. 5 shows in detail the apparatus for working the eyelet-hole.

In referring to the drawings each letter of reference will designate the same part as represented in the different figures.

A is a cast-iron frame or stand, to which all the machinery is attached.

B is the fly-wheel.

C is the main shaft, having the fly-wheel on one end and the crank D upon the other.

E and F are the needle-arms.

G is the shaft upon which the needle-arms are hung.

H is a connecting-rod between the crank D and the needle-arms.

I is a section of the table on which the cloth is laid.

a a' are two cams on the main shaft, to operate the levers *b b'*.

c c' are two chains, through which the levers *b b'* give a rotating motion to the thread-guides.

d d' are two cams which give lateral motions to the thread-guides.

e e' are two rods upon which the thread-guides are fastened.

f f' are the thread-guides.

g is the cloth-holding apparatus.

h h are two springs to move the thread-guides to their first position after they have performed their work.

i i' are the two needles.

k is a feed-bar.

l is a feed-wheel with notches in the edge for the feed-bar *k* to operate it by.

m m are small thread-holders to hold the thread, that it may be kept straight while it is passing into the eye of the needle.

o is a piston, which extends from the back part of the needle-holder *q* through the needle to the eye. Said piston is fastened into a block, *r*, which moves with it. It is surrounded by a spring, *p*.

s is the foot of the cloth presser or holder.

t t' are two springs to bring the thread-holders into their first position laterally after they have performed their work.

u is a cam on the same shaft with the needle-arms, to operate the feed-motion indicated by a dotted line, as seen in Fig. 2.

v is a small slotted tube, through which one of the needles passes.

w is a spring-catch to hold the feed-wheel when the feed-bar has moved it.

x is the thread.

y is a projection on the thread-guide, against which the thread-holder presses to hold the thread while it is passing into the eye of the needle.

z shows the form of stitch my machine makes in working eyelet-holes.

Having described the several parts of my improved sewing-machine, I will proceed to describe its operation, and especially in working eyelet-holes, for this machine is adapted to that work, though the same principle may be modified to suit many kinds of sewing.

In describing the operation of this machine I will suppose that the thread *x* has been drawn from the spool *x* under the pin *S'''* and under the middle of the thread-guide *f*, and held out by the hand at an elevation of about thirty degrees, which keeps it straight underneath said thread-guide, so that when the machine is turned to the position shown in Fig. 2 the needle *i'* will stand a little outside of the thread. By turning the fly-wheel in the direction indicated by the arrow-point at B, Fig. 2, the crank D is raised up, causing the lower needle-arm, F, to move downward by means of the connection-rod H, causing the needle *i'* to catch the thread in its eye and carry it down through the small slotted tube *v* and through the cloth. If it be placed around said tube and on the feed-wheel, as represented in Fig. 1, so that the thread will be left extended through the hole in the cloth, as seen at No. 1, Fig. 3, we will suppose that the machine has turned

far enough to have caused the upper needle to have pressed down through the cloth *j* and the eye to have been opened by means of the piston *o*, which closes the eye, being drawn back by the block *r*, catching on the projection *r'*, and thereby stopping said piston before the needle has reached its lowest point. We will also suppose that the thread had been thrown into the eye, and that said needle had passed back up through the cloth and carried the thread with it to the position seen in Fig. 1, and then the thread would occupy the position through the hole in the cloth and through the cloth, as seen at No. 2, Fig. 3, and the thread will pass up through the upper thread-guide, *f*, in the manner shown at No. 5, Fig. 3. By turning the machine a little farther, the cam *a* moves the lever *b* in such manner as to draw the chain *c* down and turn the cam *d* about half-way round, causing the shaft *e* and the thread-guide *f* to turn with it, and as it turns it bends or wraps the thread which passed through it half-way round it in such a manner as to pass over the two points at *m'''*, No. 4, Fig. 3, over the aperture through said thread-guide, near the middle of it, and through between the thread-holder *m*, and the projection *y*, which holds the thread fast by means of a spring, *m''*, attached to the other end of said holder, which presses it up, (as said holder can turn freely on the shaft *e*.) When in this position, by turning the machine a little farther, the under needle, *i'*, is passed up through the thread-guide *f*, just outside of the thread, as it is stretched over the top of it. Then, by turning a little farther, the cam *d*, by moving past the projection *d''* on the frame *A*, causing the shaft *e* and the thread-guide *f* to move laterally in such manner as to cause the thread within the thread-guide to press against the needle, as seen at No. 4, Fig. 3. Next movement of said machine is to carry the needle down. The thread slips into the eye when it comes to it, and is carried down through the tube *v*, as before, leaving the thread through the cloth and through the hole in it, as seen in section at No. 3, Fig. 3; but before the upper needle enters the cloth said cloth is fed round far enough for a stitch. This is effected by means of the cam *u* pressing against the end of the feed-bar *k*, causing it to move laterally, and the other end is so formed as to catch in one of the notches of the feed-wheel *l*, and moving it a notch or more, if desirable. On the upper side of the feed-wheel are small teeth, upon which the cloth is held by the foot *s*, which is connected with a rod, *s'*, extending up through the cloth-holding apparatus *g* and fastened to a handle, *s''*, above it. This rod *s'* is surrounded by a spiral spring, which presses it downward, causing the foot *s* to press onto the cloth with a yielding pressure. Said foot *s* has a slot extending in the same direction from the center with the slot in the tube *v*, so that when the cloth is placed round the small or upper part of the tube *v* the lower needle, *i*, can pass up through the hole in said tube

and carry the thread down through it, while the upper needle, *i*, can pass down through the slot in the foot *s* through the cloth and the slot in the tube *v* at one side from the center, and bring the same thread which was carried down through the hole in the cloth by the lower needle up through the cloth not far from the edge of said hole. When the process has been continued until the cloth has been fed entirely round, turning, as it does, on the small part of the tube *v* for a center, having the thread first pass down through the hole of said tube and then up through the cloth near the edge of the hole in it at each movement of the feed-wheel *l*, then said thread is worked into the edge of the cloth all around the hole, giving it a similar appearance to the edge of a worked button-hole, and the thread, as it is thus worked into said eyelet-hole, assumes a form similar to the drawing shown at No. 7, Fig. 3. There is a spring on the back edge of the feed-bar, (indicated by the dotted line at *k'*,) arranged at such an angle to the feed-bar as to draw said feed-bar back into its first position after the feeding has been performed, and also to keep the end of said feed-bar close into the notches of the feed-wheel *l*.

After having fully described the operation of the upper thread-guide, *f*, it is only necessary to say that the lower one, *f'*, operates in a similar manner and performs the same office and guides the thread into the eye of the upper needle, *i*, when it passes down through the cloth in the same manner as the upper thread-guide, *f*, guides the thread into the lower needle, *i'*, when it passes up through the tube *v*. The necessary motions are given to said thread-guide *f'* by the cam *a'* through the lever *b'*, the chain *c'*, and the cam *d'*. There are two springs, *h* *h'*, and two chains, *c''* and *c'''*, to turn said thread-guides into their first position, respectively, after the thread has been guided into the eye of the needle. The lower needle, *i'*, has no piston passing through it, but is formed as shown in section at No. 3, Fig. 4. The formation of the upper needle, *i*, together with the part of the piston *o* which passes through said needle, is also shown in section at No. 2, Fig. 4. The needle *i*, the needle-holder *q*, the piston *o*, and the block *r*, which said piston is screwed into, are shown in section in their proper size at No. 1, Fig. 4. The upper side of the feed-wheel *l* is shown at No. 1, Fig. 5. The space in the table *I*, the spring *w* to hold the feed-wheel in position, the tube *v*, with its slot, and the end of the feed-bar *k* are shown at No. 2, Fig. 5. A side view of the tube *v* is shown at No. 3, Fig. 5. *n*, Fig. 1, is a small metallic strip, placed just above the upper thread-guide, to prevent the thread from falling in such way that said thread-guide cannot manage it.

After having fully described my machine and the operation thereof, what I claim as my invention, and desire to secure by Letters Patent, is—

1. A thread-guide which guides the thread into the eye of the needle by means of the projection *y* and the thread-holder *m*, forming a thread-clamp and gripping and holding the thread between them, while the thread-guide with its clamp revolves until the thread is wrapped partly round it and stretched across the aperture therein, and then, also, by means of the thread-guide with the thread thus held moving laterally until in this manner and by means of these rotary and lateral motions the

thread is effectually guided into the eye of the needle.

2. The working of eyelet-holes in cloth or other material by means of a rotary feed motion, combined with the slotted tube *v* and two needles, all substantially as above described.

S. H. ROPER.

In presence of—

WILLIAM WICKERSHAM,
W. H. WILLSON.