

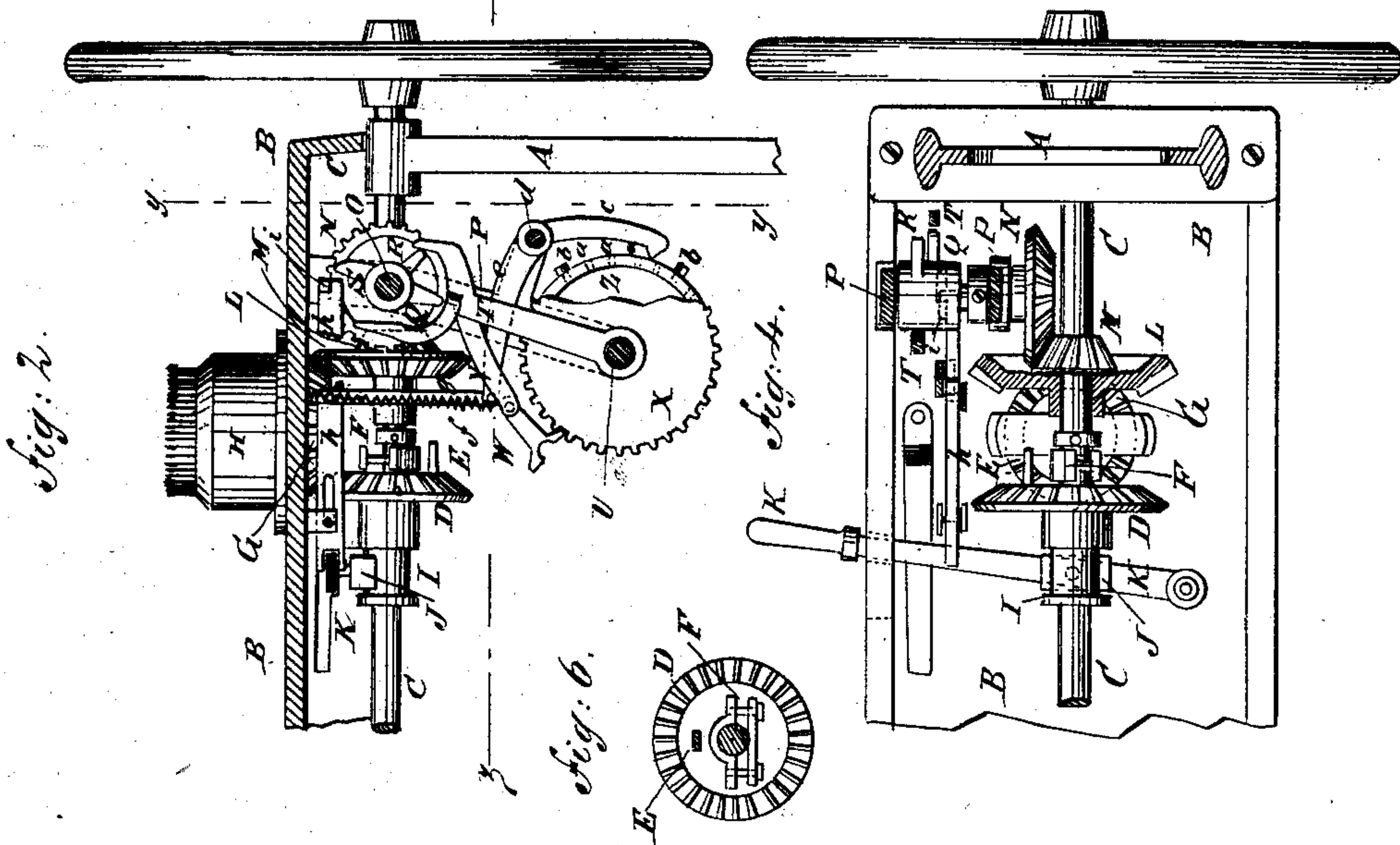
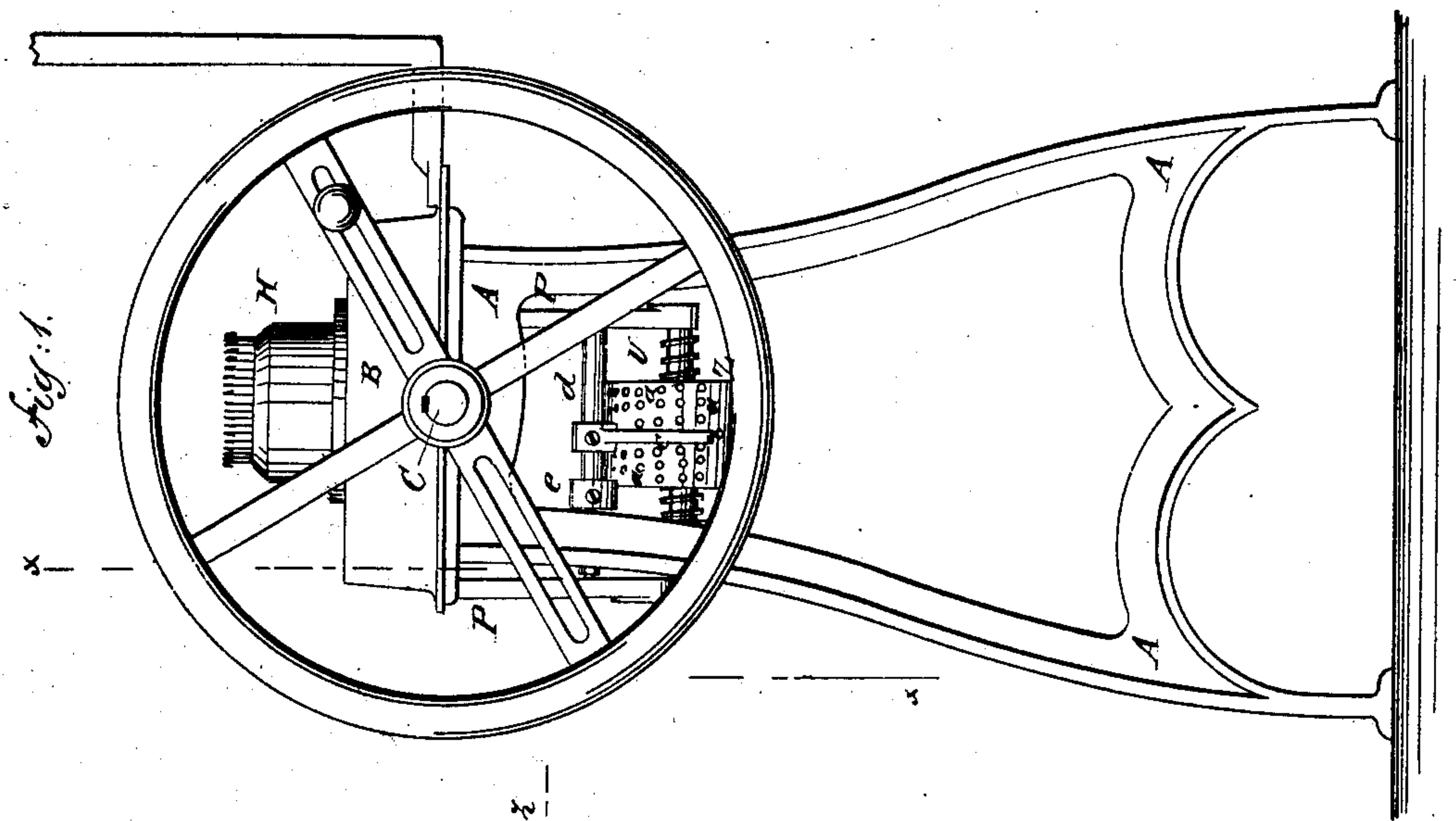
(No Model.)

E. E. KILBOURN.

STOP MOTION FOR CIRCULAR KNITTING MACHINES.

No. 245,178.

Patented Aug. 2, 1881.



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STOP-MOTION FOR CIRCULAR-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 245,178, dated August 2, 1881.

Application filed April 1, 1881. (No. model.)

To all whom it may concern:

Be it known that I, EDWARD E. KILBOURN, of New Brunswick, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Knitting-Machines, of which the following is a full, clear, and exact description.

Figure 1 is an end elevation of one of my improved knitting-machines. Fig. 2 is a sectional front elevation of the same, taken through the line *x x*, Fig. 1. Fig. 3 is a sectional side elevation of the same, taken through the line *y y*, Fig. 2. Fig. 4 is a horizontal section of the same, taken through the line *z z*, Fig. 2, looking upward. Fig. 5 is a sectional elevation of the pattern-cylinder, showing the screw, driving-pins, and gear-wheel in side elevation. Fig. 6 is a side elevation of the beveled-gear wheel that drives the knitting mechanism and its driving-clip, the shaft and the driving-lug being shown in section.

The object of this invention is to stop the knitting mechanism of a knitting-machine automatically in knitting striped goods when a stripe of the desired width has been formed.

A represents the frame, and B the table, of a knitting-machine.

C is the driving-shaft, upon which is placed a beveled-gear wheel, D, upon the side of which is formed, or to it is attached, a lug or pin, E, in such a position as to be struck by a clip, F, secured to the shaft C, so that the gear-wheel D will be carried around by and with the shaft C in its revolution. The teeth of the beveled-gear wheel D mesh into the teeth of a beveled-gear wheel, G, connected with and giving motion to the knitting mechanism H.

In the hub of the beveled-gear wheel D is formed a ring-groove, I, to receive a shoe, J, connected with the lever K, the inner end of which is pivoted to the lower side of the table B, or to a support attached to the said table. The outer part of the lever K projects through an L-slot in the forward flange of the table B. As thus far described there is nothing new in the construction.

Upon the shaft C is placed a loose beveled-gear wheel, L, the teeth of which mesh into the teeth of the beveled-gear wheel G, that drives the knitting mechanism. With this construction the gear-wheel L and the mech-

anism connected therewith will stop when the gear-wheel D is thrown out of gear with the gear-wheel G, and will not be rotated by the driving-shaft C, that revolves continuously. The rear side of the gear-wheel L is concaved, and in the space thus produced is formed a small beveled-gear wheel, M, the teeth of which mesh into the teeth of a larger beveled-gear wheel, N, attached to a short shaft, O. The drive-shaft C thus carries the wheel D, which turns the wheel G, that revolves the loose wheel L, with the pinion M attached thereto, so as to actuate the wheel N. The shaft O works in bearings in the upper part of the small frame P, attached to the table B.

To the outer part of the shaft O is attached a hub carrying three arms, Q R S, one, Q, of which strikes the inner arm of the forked upper end of the lever T and moves the upper end of the said lever inward. The second cam, R, strikes the outer arm of the said lever and moves the upper end of the lever T outward. The upper end of the lever T is thus moved in both directions with a positive movement. The two cams Q R are not in the same vertical plane, and the arms of the lever T are made with lateral offsets in opposite directions, so that each arm can be struck only by its own cam. The lower end of the lever T rides upon and is secured to the hub of the ratchet-wheel X, secured to a screw, U, rigidly attached to the lower part of the frame P.

To the lever T is rigidly attached, or upon it is formed, an arm, V, to the end of which is pivoted a pawl, W. The pawl W engages with the teeth of a ratchet-wheel, X, which works loose upon the shank of the stationary screw U. The pawl W is made double, so that it can be reversed and made to turn the ratchet-wheel X forward or backward, as may be required.

To the ratchet-wheel X are attached two pins, Y, which pass through holes in the web of the cylinder Z, so that the ratchet-wheel X will carry the cylinder Z with it in its revolution. In the hub of the cylinder Z is formed a screw-thread to fit upon the thread of the screw U, so that the cylinder Z will be moved forward and back by the forward and rearward revolution of the ratchet-wheel X. The shell of the cylinder Z is filled with holes *a*, which are arranged in a continu-

ous spiral row, the pitch of the spiral row of holes being exactly the same as the pitch of the thread of the screw U. In the holes *a* are placed pins *b*, which are arranged at such a distance apart as the width of the successive stripes in the stocking or other goods may require, the pins *b* thus forming a pattern of the desired striping. *c* is an arm, the lower end of which has a projection formed upon it. The projection of the arm *c* rests upon the shell of the cylinder Z, and is beveled upon its inner and outer sides, so that when the said projection is struck by one of the pins *b* the lower end of the said arm will rise and pass the said pin, whether the cylinder Z be revolving forward or backward. The upper end of the arm *c* is rigidly secured to a rod, *d*, which works in bearings in the frame P. To the rod *d* is attached the lower end of an arm, *e*, to the upper end of which is attached the lower end of a spiral or other spring, *f*. The upper end of the spring *f* is attached to the table B, so that the tension of the said spring will hold the lower end of the arm *e* against the shell of the cylinder Z. The arms *c e* and the rod *d* operate as a bent lever, and will hold the outer end of the bar *h* above the range of the cam S until the said bar *h* is drawn down by the movement of the said bent lever *c d e*.

To the upper end of the arm *e* is pivoted the lower end of the bar *g*, the upper end of which is pivoted to the inner end of the sliding bar *h*. The bar *h* is pivoted at its middle part to a support attached to the table B, and is slotted longitudinally to receive the said pivot, so that the said bar *h* will also have a longitudinal or sliding movement. The forward end of the bar *h* is rabbeted or made with a shoulder to receive the stop-lever K, as shown in Fig. 2.

Upon the inner or rear end of the bar *h* is formed a short arm, *i*, which projects laterally, so that when the inner end of the said bar *h* is drawn downward the arm *i* will be struck by the cam S. With this construction, when one of the pins *b* strikes and raises the end of the arm *c* the inner end of the bar *h* will be drawn downward, and the arm *i* will be struck by the cam S and pushed forward.

The downward movement of the end of the bar *h* raises the stop-lever K out of the vertical arm of its slot, and the forward movement of the said bar *h* pushes the said stop-lever along the horizontal arm of its slot, throwing the mechanism out of gear until the operator has applied a thread of another color and has moved the stop-lever K back to its place. With this construction the stripes will all be of exactly the required width, thus relieving the attendant from the necessity of constantly watching the machine, so as to stop it at exactly the right time to change the yarn to a different color. When the pattern has been completed the double pawl W is reversed and the knitting is continued, forming the pattern in a reverse order.

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

1. The combination, with the driving-shaft C, the gear-wheel G, that drives the knitting mechanism, and the stop-lever K, of the gear-wheels D L M N, the cams Q R S, the forked vibrating lever T, the reversible pawl W, the ratchet-wheel X, the stationary screw U, the pattern-cylinder Z, having spirally-arranged holes in its shell, and the pins *b*, the bent lever *c d e*, the spring *f*, for holding the lower arm of the bent lever *c d e* against the pattern-cylinder Z, the connecting-bar *g*, and the pivoted sliding bar *h*, substantially as herein shown and described, whereby the knitting mechanism is thrown out of gear automatically at fixed times, as set forth.

2. The combination, with the cams Q R, of lever T, ratchet-wheel X, pattern-cylinder Z, and reversible pawl W, for the purpose of reversing the pattern-cylinder, as described.

3. In a knitting-machine, the combination, with the pattern-cylinder Z, having the pins *b* applied thereto, of the bent lever *c d e*, the spring *f*, the connecting-bar *g*, the sliding pivoted bar *h*, having the arm *i*, the lever K, and the cam S, as set forth.

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Witnesses:

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