

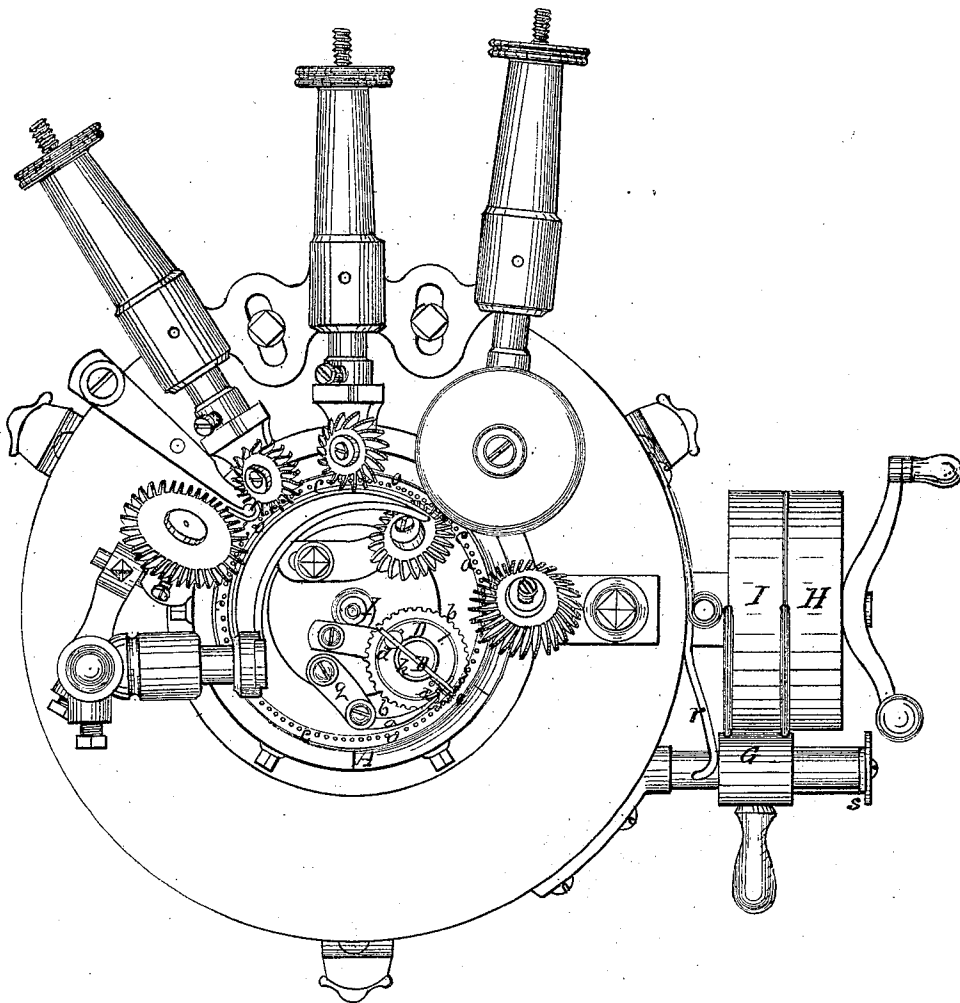
3 Sheets--Sheet 1.

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Knitting-Machines.

No. 143,051.

Patented September 23, 1873.

Fig. 1.



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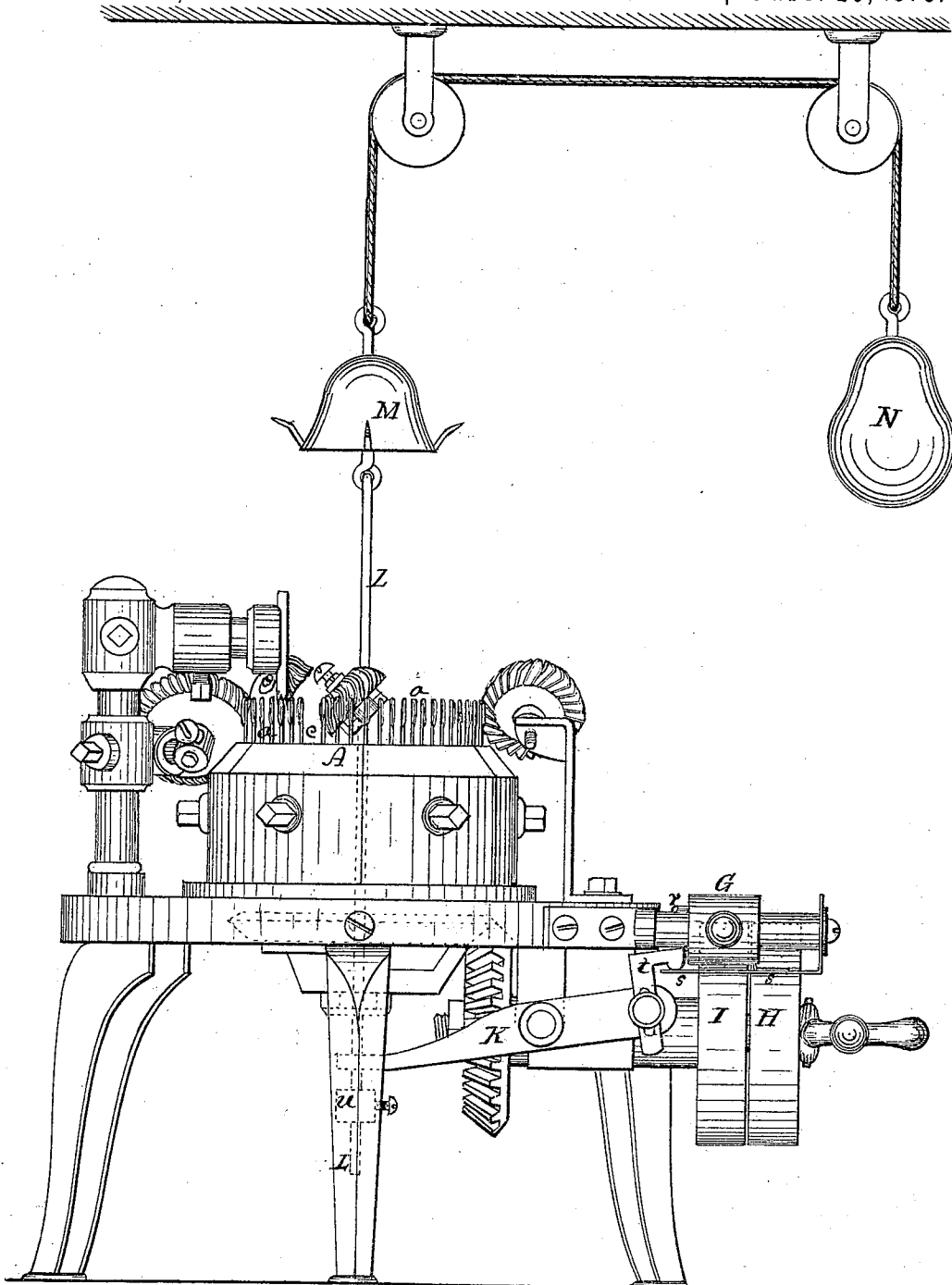
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Fig. 2.

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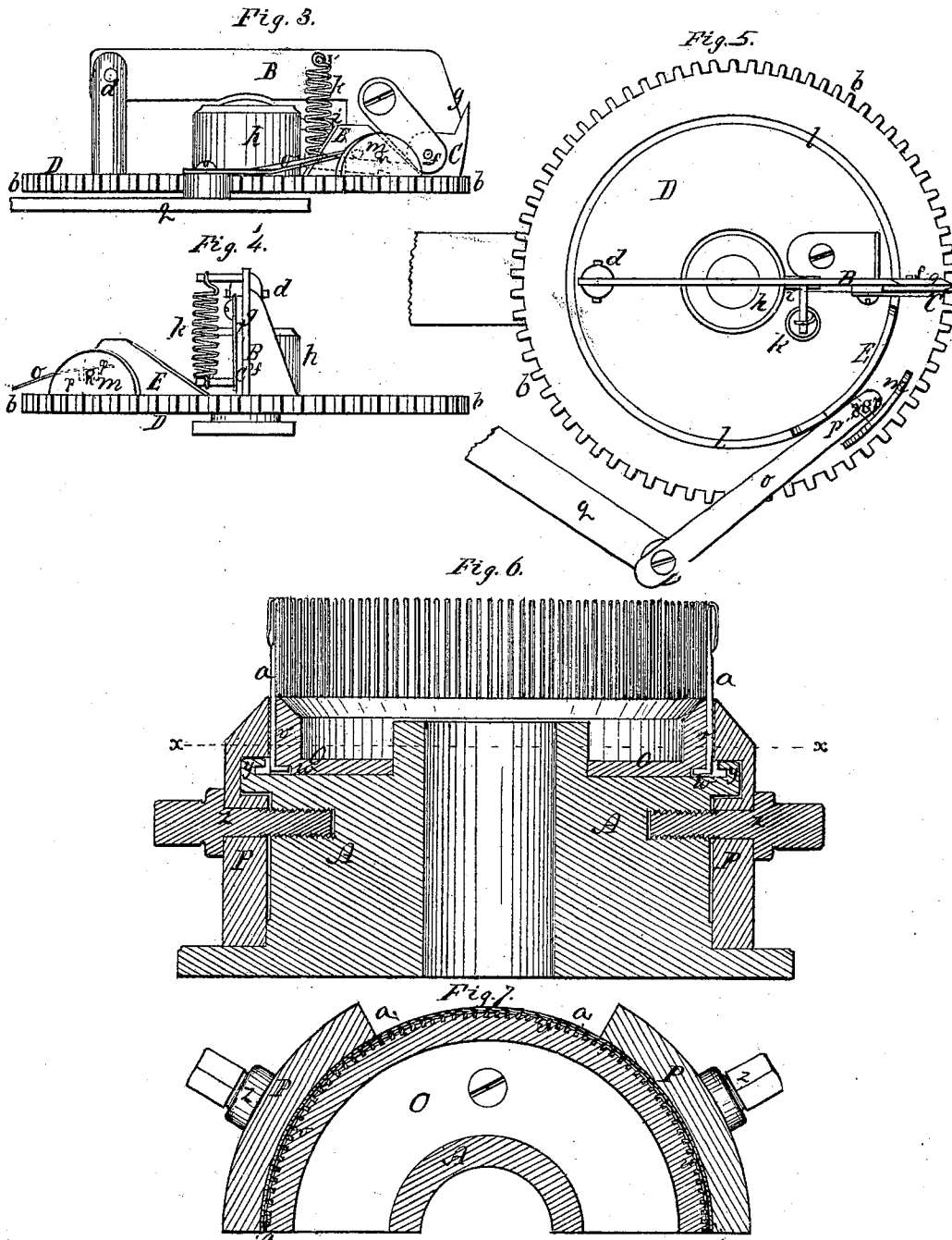
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UNITED STATES PATENT OFFICE.

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JOHN S. CRANE AND BENJAMIN F. PEASLEE, OF SAME PLACE.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **143,051**, dated September 23, 1873; application filed
February 24, 1873.

To all whom it may concern:

Be it known that I, CHARLES H. YOUNG, of Lake Village, in the county of Belknap and State of New Hampshire, have invented Improvements in Knitting-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompany drawings making part of this specification—

Figure 1 being a top view of a knitting-machine provided with my improvements; Fig. 2, a side elevation of the same; Figs. 3, 4, 5, 6, and 7, views of parts thereof.

Like letters designate corresponding parts in all of the figures.

Let A represent the needle-cylinder of a circular knitting-machine, and *a a* the needles therein.

The first feature of my invention consists in the arrangement, as hereinafter described, of a cutter or cutters for automatically cutting apart the feet of stockings, when knitting the same together in one web, while in the act of knitting.

As shown in the drawings, B C represent a pair of cutters, mounted upon a revolving disk, D, on the top of the needle-cylinder A, inside of the needles *a a*. The disk is thus conveniently and simply caused to revolve by having cogs *b b*, which match with the needles, and receive motion therefrom. There are needles omitted—one in each place—where the feet of the stockings are to be cut apart, the spaces thus formed being represented at *c c*, Fig. 1, the effect of which omission is to make lines of widened spaces between the stitches where the thread simply crosses direct from one adjacent stitch to the other, thus allowing the cutters to cut vertically for severing the threads. When the pivoted cutter B is brought round between the needles it goes into the spaces where the needles are omitted, as above set forth, and then by giving an upward and inward movement to the cutter on its pivot *d*, it severs the threads joining the stockings. To give full effect to the cutting action thus produced another cutting-blade, C, is caused to act in connection with the blade B. This additional cutter may be pivoted to the cutter B, as at *f*, Figs. 3, 4, and 5, so as

to act as a shear-blade in connection with the cutting-end *g* of the blade B. In order to give the said cutter-blade C a vibratory shearing movement on the other blade, the rear end thereof extends inward toward the center of the hub-bearing *h* of the disk D, from which projects a stud or pin, *i*, at a little distance directly above the said rear end of the blade C. Thus, when the upward vibratory movement of the blade B is produced, the rear end of the blade C strikes the stationary stud or pin *i*, and holds it from farther rising, while the outer end continues to ascend with the blade B. The effect is to swing the outer end of the blade C inward on its pivot and produce the required shearing action with the blade B. A counter-spring, *k*, returns the blade C to position, as the blade B again descends, and separates their cutting-edges. The blade B is raised, while engaged with the stocking, by means of a stationary cam or inclined edge-plate, E, arranged as most clearly shown in Figs. 3, 4, and 5. It simply rests on the disk D, riding in a concentric groove, *l*, in the upper surface of the disk, to keep it in position. Another plate or piece, *m*, rides outside of and at a little distance from it, being connected therewith by a pin or cross-bar, *n*, thereby holding the cam-plate E in an upright position. A spring-holder, *o*, presses down upon the cross-bar *n* between the plates and holds it between two pins, *p p*, or equivalent means, so that the cam is not only held firmly down on the disk, but is prevented from moving out of position. The spring-holder is secured to a stationary arm, *q*, or other suitable fixed part of the machine.

The whole device above described for cutting the threads may be varied or changed at will, provided that it operates with the same effect.

The cutters do not sever the last two or three rounds of stitches, but leave enough always knit in advance to hold the work together.

It not being necessary to cut the threads at every round of stitches, I find it convenient to foot an uneven number of stockings at one time, five sections of needles being represented in the drawings for footing five stockings, and

to have the cutters B C come around so as to cut only at every other parting of the stocking-feet, thereby severing it at each parting in every alternate round, and two threads at once. This requires a less rapid movement of the cutters than an even number of sections, and, though I do not confine my invention thereto, I prefer it.

The great advantage of this self-severing of the stocking-feet is a direct saving of the whole expense ordinarily required to cut the stocking-feet apart by hand.

Another feature of my invention consists in an automatic stop attached to a knitting-machine, so arranged as to stop the motion of the machine when the foot or heel of a stocking has been knit long enough, or in case the works runs off accidentally, thereby, in one case, preventing waste by knitting too much, and, in the other case, preventing damage to the machine which might occur if the machine were to continue running with no work thereon. The device by which I effect this object is represented in Figs. 1 and 2, and is substantially as follows: The belt-shipper G for the driving-belt is arranged so that when set free a spring, *r*, will slide it opposite to the loose pulley H. It is held opposite to the driving-pulley I by a spring-catch, *s*; and a lever, K, is provided with a projecting finger, *t*, so arranged over the said catch that a slight depression of that end of the lever will lower the catch and set the belt-shipper free. A rod, L, extends upward through a slot in the other end of the lever, and through the center of the machine to the bell or swivel M, from which the work is suspended. An adjustable stop, *u*, is attached to the rod L, below the lever, in a proper position, so that when the work is formed, and gradually raised by the weight N until it is of the proper length, the said stop, by the lifting of the rod L, strikes the lever K, and lifts it till the catch *s* sets the belt-shipper free and stops the machine.

Figs. 6 and 7 represent, respectively, a central vertical section of the needle-cylinder and a half-horizontal section of the same in the line *xx*, Fig. 6. There are needle-grooves *v v* cut on the needle-cylinder A, narrow and deep, with plane sides, as shown in Fig. 7, and having the needles *a a* flattened to fit the grooves for the purpose of keeping the needles from

turning sidewise, and of holding the beards thereof square in front, or radial to the needle-cylinder. I also make a recess, *w*, in the bottom of the ring O to admit the shanks of the needles, and thereby prevent them from being drawn upward by the work.

Another improvement in this part of the machine consists in an outer rim or flange, *y*, on the needle-cylinder A, close to the lower ends of the needles, outside thereof, substantially as shown in Fig. 6. The object of this rim is to prevent the needles from being thrown out of place by the inward and upward strain or drawing of the work when the needle-plates P P are removed or displaced for the purpose of taking out broken or injured needles from the machine. By this construction, also, I am enabled to remove and insert needles without entirely removing the plates P P. By one or two turns of the screws *z z* backward the plates will be sufficiently separated from the needles to enable any needle to be drawn from its groove; and then, by turning the needle about a quarter of a circle, the shank thereof will be disengaged from beneath the ring O, when it may be removed at once. Thus much time and trouble are saved in changing and replacing the needles.

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

1. The cutter or cutters B C, arranged and operating substantially as herein described, in combination with the needle-cylinder A and needles *a a*, substantially as and for the purpose herein specified.

2. The automatic stop, composed of the spring-catch *s*, lever K, and rod L, or their equivalents, operating in combination with the belt-shipper G and work-suspending swivel M, substantially as and for the purpose herein specified.

3. The rim or flange *y* on the needle-cylinder A, arranged in combination with the needles *a a*, substantially as and for the purpose herein specified.

Specification signed by me this 4th day of March, 1872.

CHARLES H. YOUNG.

Witnesses:

S. C. CLARK,
THOMAS E. HUNT.