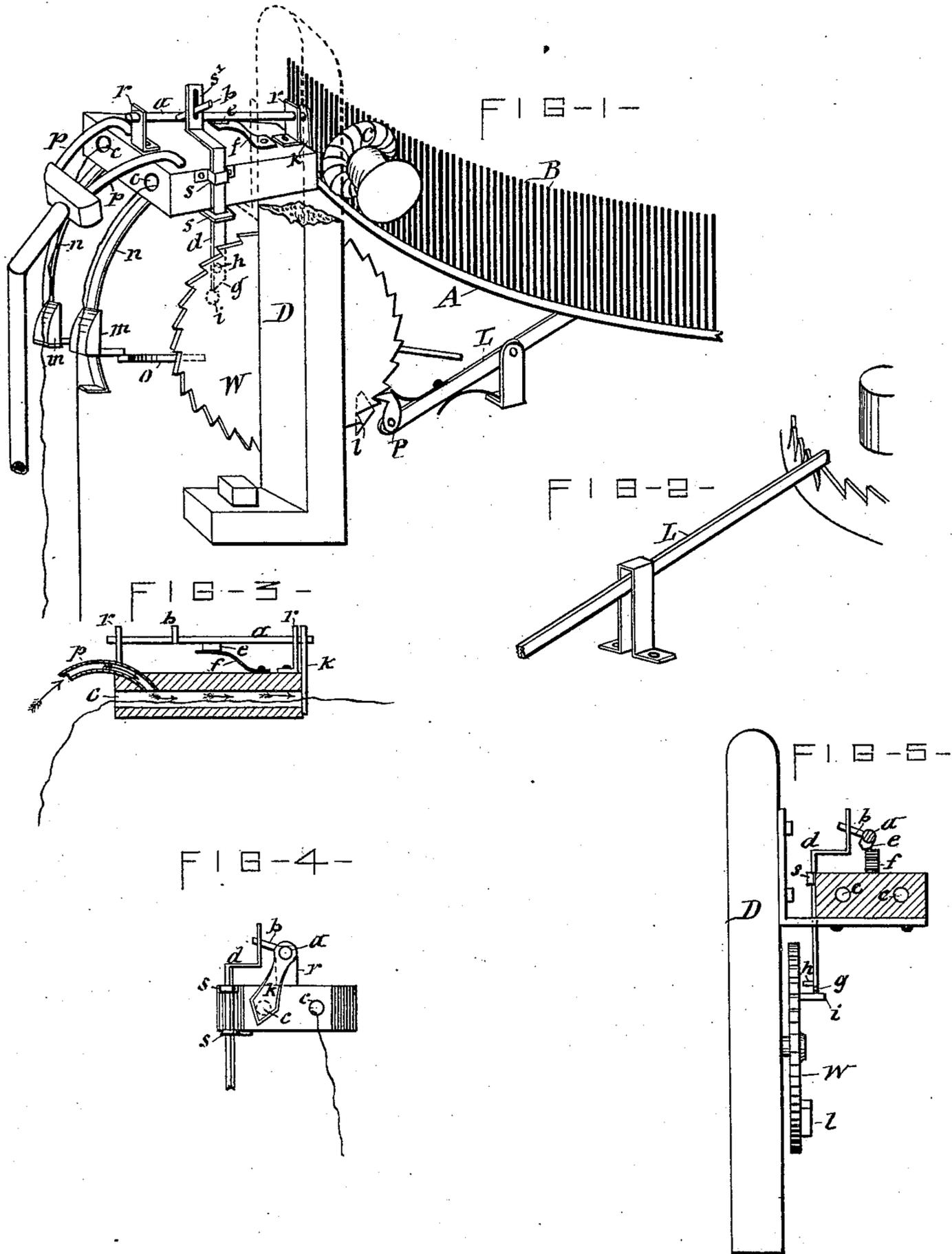


(No Model.)

J. DENTON.
KNITTING MACHINE.

No. 255,945.

Patented Apr. 4, 1882.



WITNESSES =
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UNITED STATES PATENT OFFICE.

JAMES DENTON, OF AMSTERDAM, NEW YORK, ASSIGNOR OF ONE-FOURTH
TO JOHN K. WARNICK, OF SAME PLACE.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 255,945, dated April 4, 1882.

Application filed January 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES DENTON, of Amsterdam, in the county of Montgomery, in the State of New York, have invented new and useful Improvements in Knitting-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

The nature of this invention consists in certain mechanism and contrivances, in combination with needle-cylinder and needles, for the purpose of feeding thereto the thread or yarn required in the process of knitting single-threaded striped fabrics, all as hereinafter fully described, and specifically set forth in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my invention, illustrating its connection with an ordinary circular-knitting machine. Fig. 2 illustrates that portion of the actuating device of my invention which is located under the needle-cylinder. Fig. 3 is a longitudinal section of the thread-guide with the devices for severing the threads and for forcing the same forward to the loop-wheel or burr which carries it into the beards of the needles. Fig. 4 is a front end view of the thread-guides, and Fig. 5 is a transverse section of the same.

Similar letters of reference represent like parts in all the figures.

A denotes the rotary needle-cylinder of a circular-knitting machine, and B the knitting-needles secured in a vertical position to the periphery of the aforesaid cylinder.

C represents the loop-wheel or burr, also sometimes termed the "sinker-wheel," which carries the thread or yarn into the beards of the needles B.

c c are two thread-guides which deliver the thread or yarn to the loop-wheel C. Said thread-guides consist of tubular thread-passages, preferably formed by drilling longitudinally through a metallic block two holes converging at such an angle as to bring said holes in range with the face of the loop-wheel C. These thread-guides are secured in position either by attaching them directly to the usual standard, D, which supports the loop-wheel C, or by attaching them to an arm extended from the aforesaid standard.

Upon the top of the thread-guides *c* are two

posts, *r r*, on which is mounted a rock-shaft, *a*, arranged lengthwise the thread-guides.

To the front end of the rock-shaft is secured a knife, K, which is sharpened on both of its side edges and around its base, which latter is made V-shaped. The said knife is arranged contiguous to the front end of the thread-guides, and is of such a width as to cover the throat or delivering end of one of said thread-guides. The rock-shaft *a* imparts an oscillating motion to the knife K, and thus causes the same to alternately cut the threads issuing from the thread-guides and immediately close the throat of that thread-guide whose thread has been severed by the knife. The rock-shaft *a* receives its motion from a pitman, *d*, which slides in guides *s* on the side of the thread-guide and has its upper end engaging an arm, *b*, projecting from the rock-shaft. The lower extremity of the pitman terminates with a sloping or beveled foot-piece, *g*, which lies in the path of a lug, *i*, fixed to the side of a ratchet-wheel, W. The encounter of the lug with the beveled foot-piece *g*, incident to the rotation of the wheel W, lifts the pitman *d*, and this in turn lifts the arm *b* of the rock-shaft and partially turns the latter in one direction. A beveled shoulder or projection, *l*, fixed to the side of the wheel W at another point and brought in collision with a lug or stud, *h*, on the side of the pitman by the rotation of said wheel, serves to draw the pitman down, and thereby turns the rock-shaft in the opposite direction, thus producing an intermittent reciprocal rotary motion of said rock-shaft, which in turn imparts an intermittent oscillating motion to the knife K.

In order to obtain a quicker and more effective movement of the knife K, the rock-shaft *a* is provided on its under side with a V-shaped cam, *e*, and directly under this cam there is a spring-plate, *f*, secured to the top of the thread-guides *c*, and bearing with its free end against said cam, and the connection of the arm *b* of the rock-shaft with the pitman *d* is made by a slot, *s'*, or vertical elongation of an eye in the pitman, through which slot the end of the arm *b* is extended. When the pitman is actuated to turn the rock-shaft the cam *e* of the latter is caused to traverse the spring-plate *f*, and when midway thereof the apex of the V-shaped

end of the cam is brought to bear on said spring-plate, and thus causes the latter to exert increased pressure. So soon as the apex of the cam *e* leaves the center of the spring-plate *f* said cam is caused to slip to one side on said spring-plate, and thereby imparts a quick turn to the rock-shaft, which quick movement is transmitted to the knife K, and thereby causes the latter to more positively sever the thread of one of the thread-guides *c*, and immediately close the throat of said thread-guide.

The ratchet-wheel W is operated by a pawl, P, which is connected to a lever, L, or any other suitable known mechanism extended under the needle-cylinder, and actuated automatically by a cam or ratchet combined with the latter or with its spindle.

p represents a blow-pipe, having its discharge end communicating with the interior of the thread-guide *c* in such a manner as to produce a current of air or other analogous or suitable fluid or gas longitudinally through said thread-guide toward the delivering end thereof, said pipe *p* being extended from and connected with a suitable blower or other device, arranged and operated in any desirable manner, and producing the requisite current of air or other analogous fluid, as aforesaid. The impingement of said current on the thread or yarn in the open thread-guide *c* propels said thread or yarn and carries the end thereof toward the loop-wheel or burr C, which applies it to the needles B in the usual way.

The lug *i* and the beveled shoulder *l* on the wheel W are arranged in such relative positions as to cause the pitman *d*, by the medium of the rock-shaft *a*, to swing at the proper time the knife K off from the throat of that thread-guide which contains the thread or yarn desired to be introduced in the operation of knitting, and simultaneously cut the other thread or yarn and close the thread-guide from whence it issues. The knife K is thus made to serve as a valve for permitting the blast from the blow-pipe *p* through the thread-guide whose thread is required in the operation of knitting, and immediately closing the other thread-guide, whose thread it severs, thereby accomplishing the interchanging of the threads automatically and in a quick and positive manner without causing either excessive laps of threads or interruptions in the feed of the thread to the loop-wheel. The aforesaid threads being of different colors and fed singly to the machine in the manner set forth produces a horizontally-striped single-threaded fabric. To the rear end of each thread-guide is attached a pendent curved or segmental bar, *n*, upon which slides a block, *m*, which is retained thereon by a suitable shoulder on the lower extremity of the bar, arresting the descent of the block. From the wheel W projects an arm, *o*, adapted to engage the block *m* and move the same upward on its guide-bar *n* during the rotation of said wheel. The bar *n* being of such contour

as to carry the block *m* off from the end of the arm *o* as said block approaches the thread-guide, so soon as the block is thus released it drops back onto the lower extremity of its guide-bar *n*.

The function of the block *m* is to take up and carry into the thread-guide the slack of the thread between the thread-guide and the bobbin, after said thread has been severed by the knife K. The face of the block *m*, being coated with fine emery or other suitable substance, is capable of drawing the thread along either by friction or adhesion.

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

1. In combination with the needle-cylinder and burr or loop-wheel of a knitting-machine, a tubular thread-guide arranged to deliver the thread to the burr, and a blow-pipe communicating with the interior of said thread-guide and arranged to propel, by pressure of air or other analogous fluid or gas, the thread introduced in said thread-guide, substantially as set forth.

2. In combination with the needle-cylinder and burr or loop-wheel of a knitting-machine, two tubular thread-guides, two blow-pipes arranged to force currents of air through said thread-guides, and a combined knife and valve for severing the thread and controlling said air-currents, as set forth.

3. The combination, with the needle-cylinder and needles, of two tubular thread-guides arranged to feed separate threads to said needles, blow-pipes for forcing currents of air through said thread-guides, a knife arranged to oscillate across the paths of the two threads, and mechanism for transmitting motion from the cylinder to the oscillating knife, all as specified.

4. The combination, with the needle-cylinder and the thread-guides *c c*, of the blow-pipes *p p* and the combined knife and valve K, arranged to alternately open and close the thread-guides, and mechanism for transmitting motion from the cylinder to said combined knife and valve, substantially as described and shown.

5. The combination, with the thread-guides *c c*, of the rock-shaft *a*, provided with the knife K and with the arm *b*, the pitman *d*, engaging the arm *b*, and suitable mechanism for imparting an intermittent reciprocating motion to the pitman, as and for the purpose set forth.

6. In combination with the thread-guides *c c*, the rock-shaft *a*, provided with the knife K and with the arm *b* and cam *e*, the pitman *d*, having the slot *s*, engaged with arm *b*, the spring *f*, engaging with cam *e*, and mechanism for operating said pitman, as described.

7. In combination with the thread-guides *c c*, the rock-shaft *a*, provided with the knife K, arm *b*, and cam *e*, the spring *f*, engaging said cam, the pitman *d*, engaging the arm *b*, and provided with the beveled foot-piece *g* and with the lug *h*, the ratchet-wheel W, provided with the lug *i* and beveled shoulder *l*, the pawl

P, lever L, needle-cylinder A, and a cam or ratchet connected with said cylinder or its spindle, substantially as shown and set forth.

5 8. The combination of the tubular thread-guide *c*, the blow-pipe *p*, combined knife and valve K, thread-lifter *m*, and mechanism for imparting an intermittent movement to said thread-lifter and knife, as specified and shown.

10 9. The combination of the thread-guide *c*, blow-pipe *p*, combined knife and valve K, and mechanism for operating the same, curved bar *n*, sliding block *m*, the wheel W, provided with

the arm *o*, and mechanism for imparting motion to the wheel W, substantially as described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 6th day of January, 1882.

JAMES DENTON. [L. S.]

Witnesses:

C. H. DUELL,
WM. C. RAYMOND.