(No Model.) 2 Sheets—Sheet 1.

C. M. MUSGROVE.

QUARTER SAVER FOR CIRCULAR KNITTING MACHINES.

No. 553,011. Patented Jan. 14, 1896.

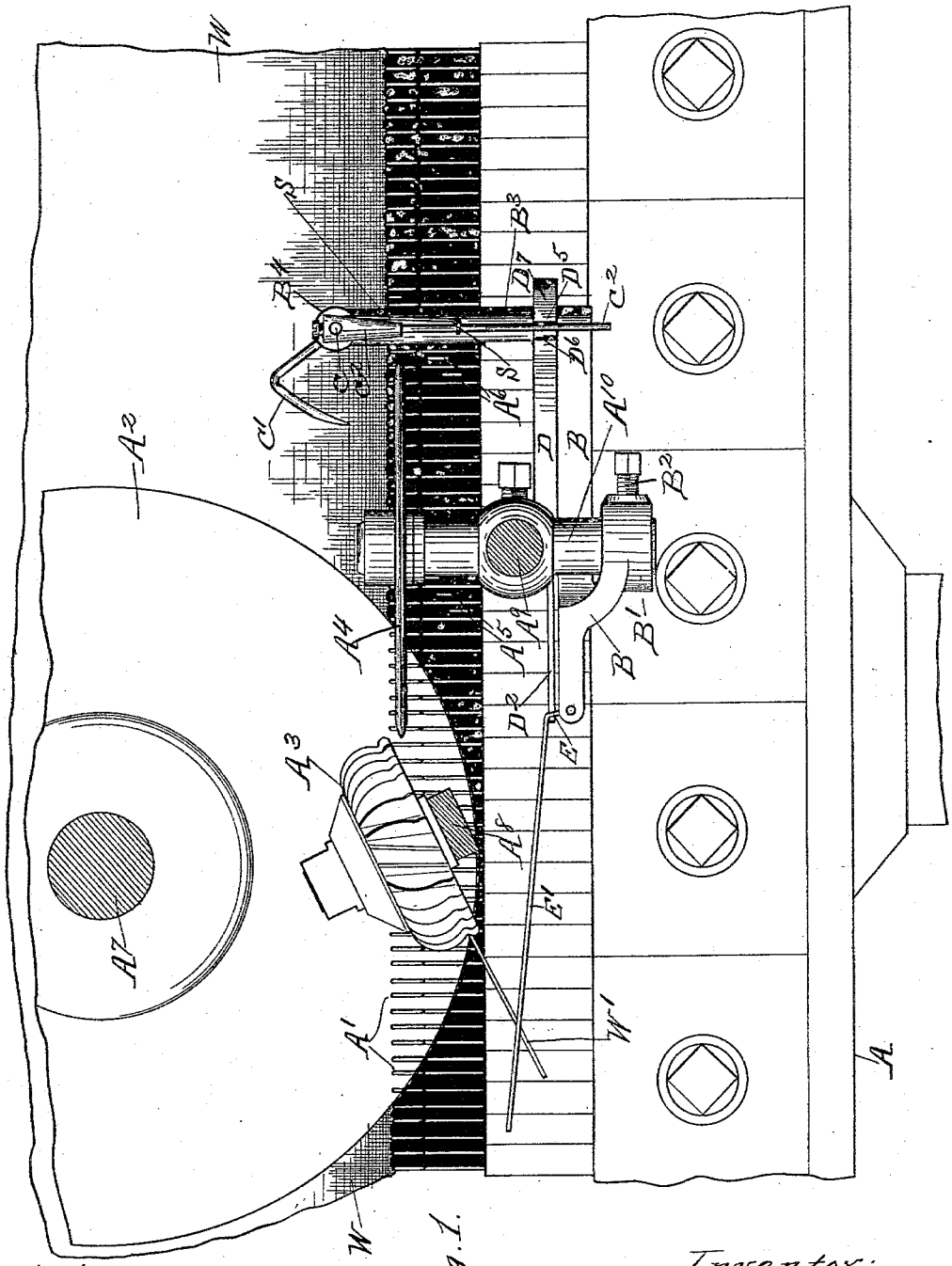

Fig. 1.

Witnesses:
G. H. Curtis
J. G. Curtis.

Inventor:
Charles M. Musgrove
By Mosher & Curtis
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ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. M. MUSGROVE.

QUARTER SAVER FOR CIRCULAR KNITTING MACHINES.

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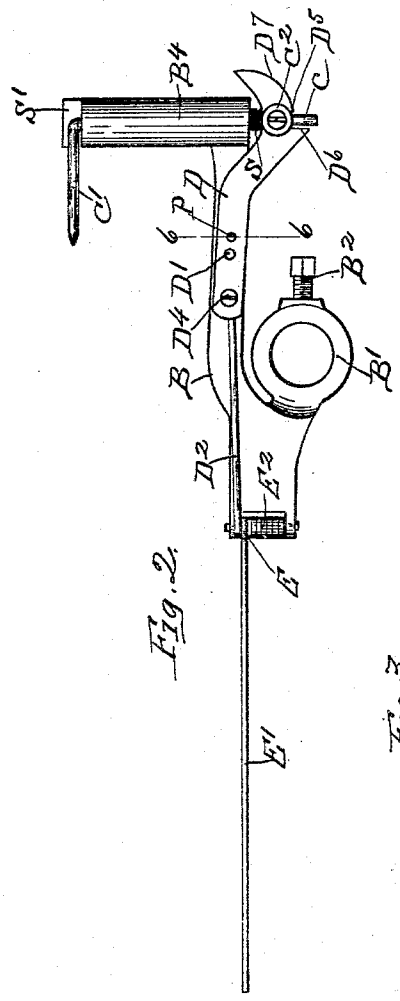

Fig. 2.

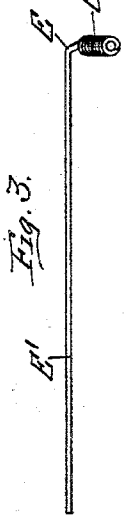

Fig. 3.

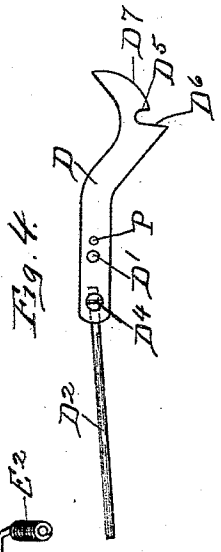

Fig. 4.

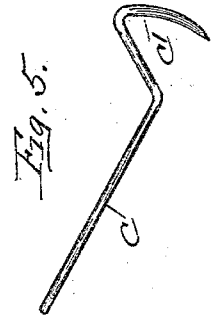

Fig. 5.

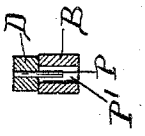

Fig. 6.

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UNITED STATES PATENT OFFICE.

CHARLES M. MUSGROVE, OF PITTSFIELD, MASSACHUSETTS.

QUARTER-SAVER FOR CIRCULAR-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 553,011, dated January 14, 1896.

Application filed May 21, 1895. Serial No. 550,041. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. MUSGROVE, a citizen of the United States, residing at Pittsfield, county of Berkshire, and State of Massachusetts, have invented certain new and useful Improvements in Quarter-Savers for Circular-Knitting Machines, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures.

Figure 1 of the drawings is a view, partly in elevation, of part of a well-known form of circular-knitting machine provided with my improved quarter-saver, the supporting-brackets for the sinker, cloth-wheel, and presser being broken away for convenience of illustration. Fig. 2 is a top plan view of the quarter-saver attachment detached. Fig. 3 is a view in perspective of the feeler detached. Fig. 4 is a top plan view of the locking-lever detached. Fig. 5 is a view in perspective of the integral wire cam-hook and shaft. Fig. 6 is a vertical cross-section taken on the broken line 6 6 in Fig. 2.

This invention is an improvement upon the device shown and described in United States Letters Patent No. 185,345, issued to J. H. Musgrove December 12, 1876, to which patent reference may be had in connection with the following description for a full understanding of my invention.

The object of the invention is to prevent the knitted web from leaving the needles upon failure of the feed, caused by breakage or running out of the yarn.

Referring to the drawings, A is the needle-cylinder, A′ are the needles, A^2 the cloth-wheel, A^3 the sinker-wheel, A^4 the presser-wheel, A^5 the burs of the landing-wheel, and A^6 the burs of the cast-off wheel, of a well-known form of circular-knitting machine.

The cloth-wheel shaft A^7 is shown in cross-section in Fig. 1, as are also the bracket A^8, which supports the sinker-wheel, and bracket A^9, which supports the spindle A^{10}, on which the presser-wheel rotates.

The yarn-guides and other portions of the machine which are well known and not necessary for a complete understanding of my invention are omitted from the drawings.

My improved quarter-saver attachment comprises the supporting-bracket B, provided with a socket B′ near one end, adapted to receive the lower end of the presser-wheel spindle A^{10}, upon which it is secured by the set-screw B^2. One arm of the bracket is offset around the spindle A^{10} and extends toward the cast-off wheel, terminating on the front side of said wheel in an upwardly-projecting post B^3, which supports a bearing-sleeve B^4 extending transversely of and above the needles. The bearing-sleeve supports the shaft C rotary therein and projecting at opposite ends therefrom. The inner end of the shaft is provided with a cam-hook C′ rotatively movable into and out of engagement with the web W of knitted fabric in close proximity to the inner side of the row of needles forward of the cast-off wheel. The outer projecting end of the shaft is provided with a depending arm C^2 engageable at its lower end with one end of the locking-lever D, pivoted upon the supporting-bracket at D′, and provided at its other end with a rod D^2 engageable with the offset E on the feeler E′.

The feeler is pivoted upon a short arm of the bracket by means of its bearing-sleeve E^2 to oscillate in a vertical plane transversely of the path of the feed-yarn W′, as shown in Fig. 1, whereby it is adapted to be supported by the yarn so long as the tension of the yarn is maintained, and to fall by gravity when the tension is relaxed by the breaking or running out of the yarn. The spring S secured at one end to the arm C^2 and at the other end to a fixed support, as the post or bearing-sleeve B^4, actuates the arm, shaft and cam-hook, tending to force the hook into engagement with the web.

The parts being set in the position shown in Figs. 1 and 2 are adapted to maintain such position until the feeler is given a sufficient downward movement to disengage its offset E from the rod D^2, leaving the locking-lever D free to be forced by the spring-actuated arm C^2 out of engagement with such arm. When

thus released the spring S acts to move the cam-hook downward into engagement with the web, whereupon the engaged end of the hook is carried by the moving web rearward and downward below the beards of the needles until the hook-arm, which terminates in such pointed end, presents a rearwardly and downwardly inclined or cam surface to the moving web. A stop S′ on the bearing-sleeve B^4 limits the movement of the hook. As the web continues its rotary movement it is depressed in passing the cam-hook sufficiently to force the stitches which have been raised by the landing-wheel above the lower ends of the beards of the needles back upon the shanks of the needles below the beards. The beards of the needles being open after passing the presser-wheel prevent the stitches from being forced from the needles by the cast-off wheel, whereby the web is prevented from leaving the needles, and the object of the quarter-saver is accomplished.

The cam-hook and its supporting-shaft are preferably formed from a single piece of wire bent to the desired shape, the hook portion being V-shaped and offset from the shaft in a plane perpendicular thereto, as shown. The feeler-finger and its supporting bearing-sleeve are also preferably formed from a single piece of wire, having one end closely wound in the form of a helical coil and its finger end approximately straight and connected with the helical coil by the offset E.

The rod D^2 is secured to the locking-lever D by the set-screw D^1, whereby the rod may be adjusted to provide for a quicker or slower release from the feeler-offset E.

The movement of the locking-lever is limited by the stop-pin P, which vibrates in an elongated slot P′ in the bracket. The lever is provided with a back-stop catch D^5 adapted to engage the lower end of arm C^2, and with a front stop projection D^6 adapted to be engaged by the arm in setting the mechanism, whereby the lever is forced by such arm into position for its catch D^5 to engage the arm, in which position it can be maintained by means of the feeler-offset so long as the feeler-finger is supported in an elevated position. The incline D^7 on the rear end of the lever leads up to the catch D^5 and enables the arm C^2 to be located in engagement with the catch, irrespective of the position of the lever, within its limit of movement.

The quarter-saver is complete in itself and requires no change in the construction of the modern circular-knitting machine.

The combined cam-hook and shaft formed from a single piece of wire bent to the desired form is adapted to constitute an improved article of manufacture which can be supplied to the trade for use with various styles of controlling and releasing mechanism.

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

1. In a circular-knitting machine, the combination with the stitch-forming mechanism, of a bracket attached to a fixed support forward of the cast-off wheel, an upright on the rear end of the bracket, a rock-shaft rotary in bearings on the upper end of the upright, a spring-actuated cam-hook on the inner end of the shaft movable into and out of engagement with the knitted web and adapted to force the web below the beards of the needles: a depending arm fixed on the outer end of the shaft, a feeler pivoted on the forward end of the bracket adapted to be supported by the feed-yarn, and provided with an offset, and a locking-lever pivoted upon the bracket with its forward end vibratory across the path of the feeler-offset, and its rear end engageable with the spring-actuated arm to control the same, substantially as described.

2. In a circular-knitting machine, the combination with the stitch-forming mechanism, of a spring-actuated cam movable into and out of engagement with the knitted web forwardly of the cast-off wheel, a feeler comprising an integral piece of wire having a yarn-engaging finger, a closely wound helical coil rotary upon a fixed support, and an offset connecting the finger and coil, a locking-lever having one end vibratory across the path of the feeler-offset, and a cam-controlling arm engageable with the locking-lever, substantially as described.

3. In a circular-knitting machine, the combination with the stitch-forming mechanism, a spring-actuated cam engageable with the knitted web forwardly of the cast-off wheel, a cam-supporting shaft, and a cam-controlling arm on the shaft, of a feeler adapted to be supported by the feed-yarn and having an offset, and a locking-lever pivoted upon a fixed support engageable with the feeler offset at its forward end, and having on its rear end a back-stop catch D^5—, adapted to engage the cam-controlling arm, an incline D^7— leading to the catch, and a front-stop projection D^6— in the path of said arm, substantially as described.

In testimony whereof I have hereunto set my hand this 16th day of May, 1895.

CHARLES M. MUSGROVE.

Witnesses:

FRANK C. CURTIS,

THOMAS H. GUY.