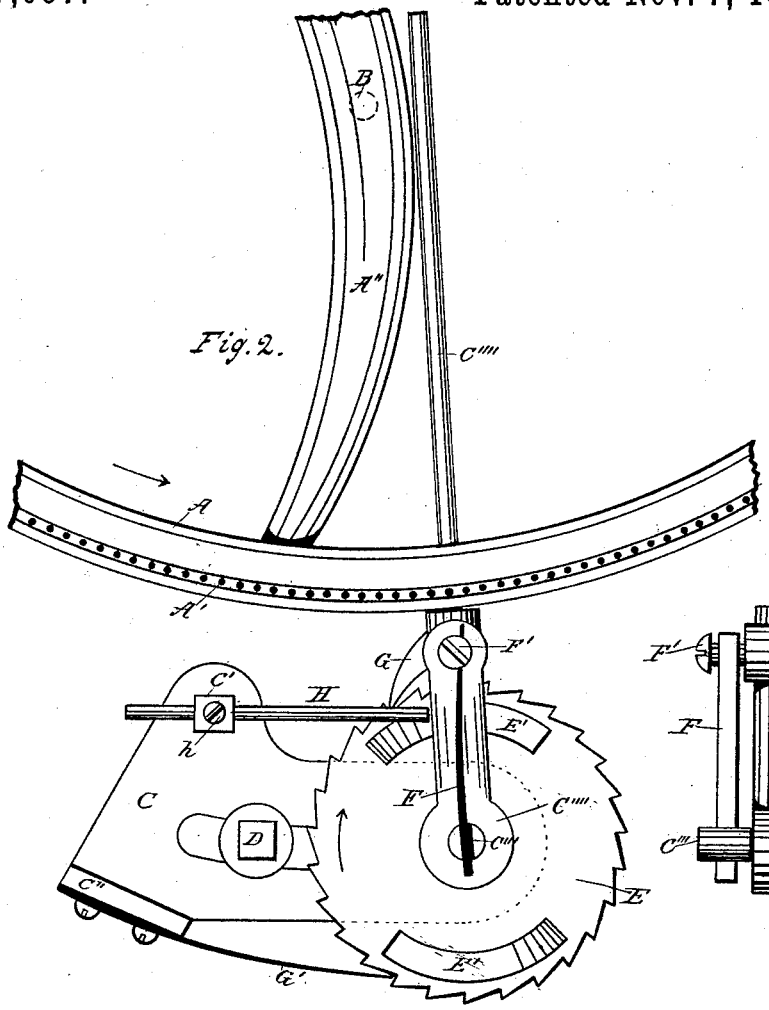
(No Model.) 4 Sheets—Sheet 1.

E. McDONNELL & J. H. SHERWOOD.

MECHANISM FOR OPERATING THE YARN GUIDES OF CIRCULAR KNITTING MACHINES.

No. 267,097. Patented Nov. 7, 1882.

Fig. 2.



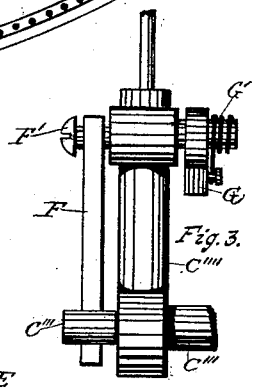
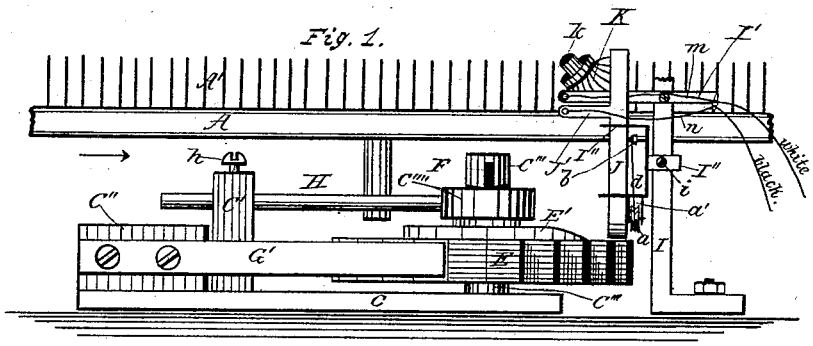


Fig. 3.

Fig. 1.



Witnesses:
Peter J. Lewis
Richard Peck

Inventors:
Edward McDonnell
James H. Sherwood
By W. Davidson Jones
Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig. 4.

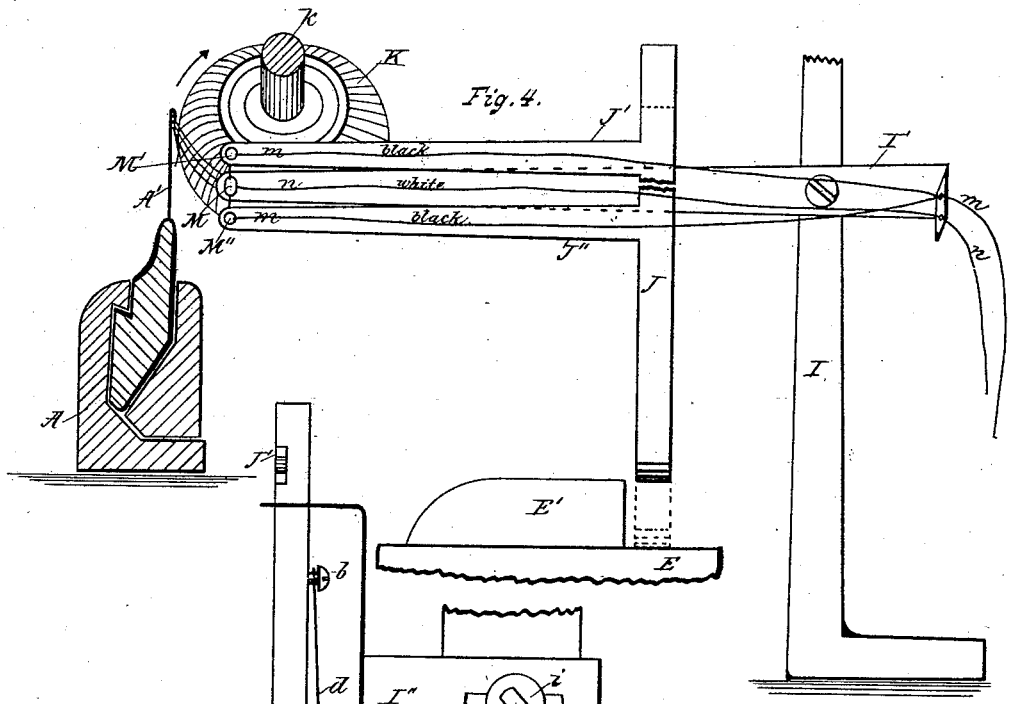
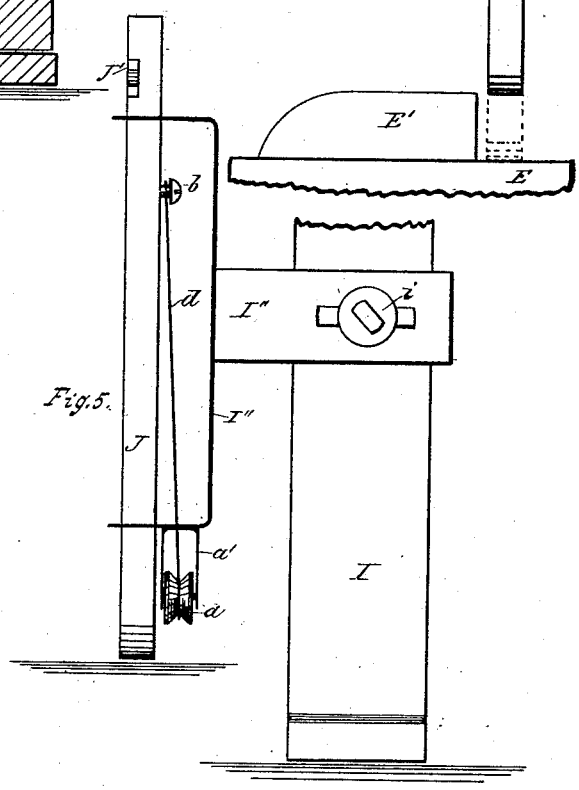


Fig. 5.



Witnesses:
Peter J. Lewis
Richard Peck

Inventors.
Edward McDonnell
James H. Sherwood
By W. Davidson Jones
Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

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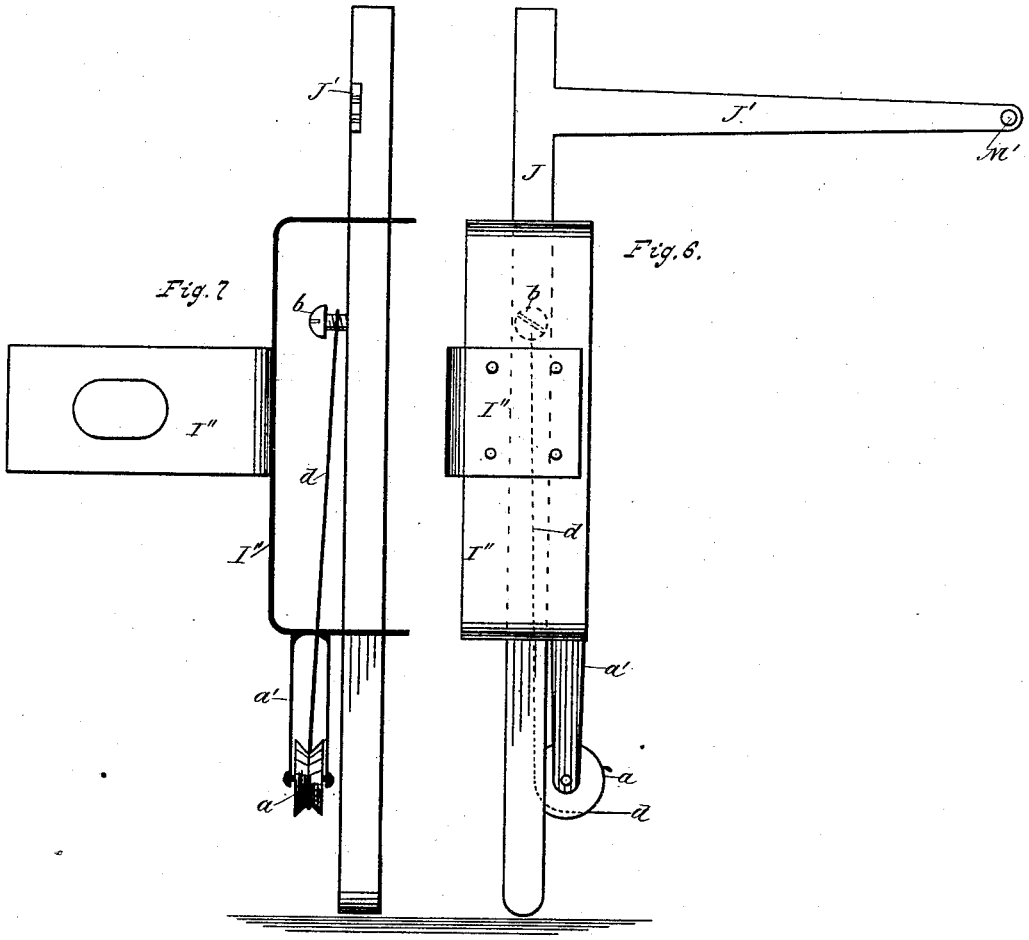

Witnesses:
Peter J. Lewis
Richard Peck

Inventors.
Edward McDonnell
James H. Sherwood
By W. Davidson Jones
Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig. 9.

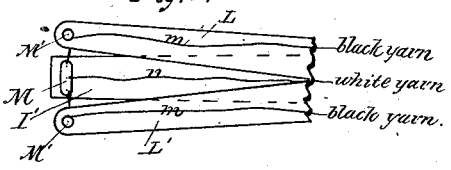


Fig. 8.

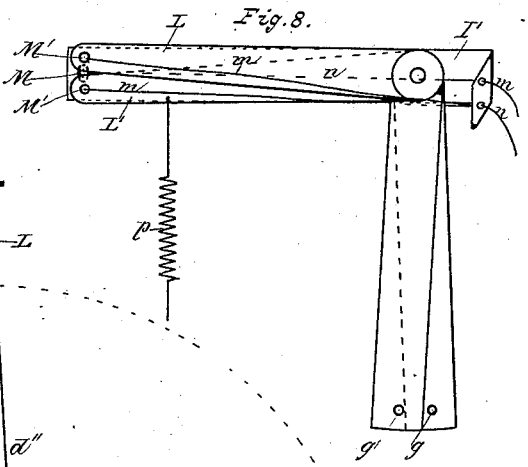
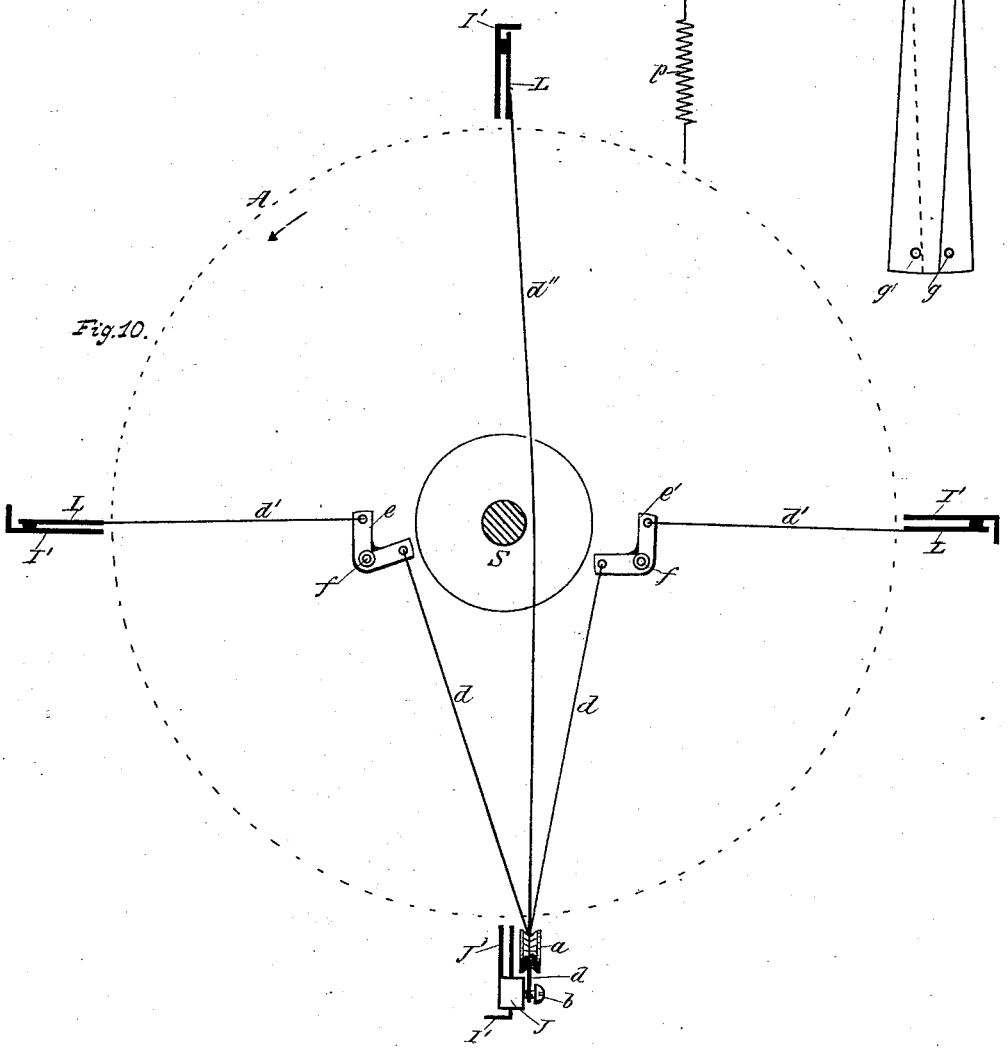


Fig. 10.



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Peter J. Lewis

Richard Peck

Inventors.

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James H Sherwood

By. W. Davidson Jones

Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

EDWARD McDONNELL AND JAMES H. SHERWOOD, OF AMSTERDAM, NEW YORK, ASSIGNORS TO SAID McDONNELL, JAMES R. SNELL, CHARLES D. DEAN, AND HENRY O'BRYAN.

MECHANISM FOR OPERATING THE YARN-GUIDES OF CIRCULAR-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 267,097, dated November 7, 1882.

Application filed August 4, 1882. (No model.)

To all whom it may concern:

Be it known that we, EDWARD McDONNELL and JAMES H. SHERWOOD, citizens of the United States of America, residing at Amsterdam village, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Mechanism for Operating the Yarn-Guides of Circular-Knitting Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Our invention consists in the peculiar combination of parts hereinafter specified, and pointed out in the schedule of claims hereto appended, for operating the yarn-guides of circular-knitting machines.

Referring to the drawings, Figure 1 represents an elevation of our device in connection with a portion of the needle-cylinder, showing the several parts and their relative positions. Fig. 2 is a plan of a section of a cylinder-head containing the needles, the ratchet-stand, ratchet-wheel lever, &c. Fig. 3 is a longitudinal elevation of a portion of the lever, &c. Fig. 4 is a section of needle-cylinder containing the series of needles, showing also the thread-guide stands and sinker-burr in elevation. Fig. 5 is a front elevation of the standard J and the supporting frame or guide attached to the sinker-stand I, and Figs. 6 and 7 represent side and rear elevations of the parts shown in Fig. 5. Fig. 8 is a side view of the auxiliary thread-guides. Fig. 9 is a similar view of a portion of the yarn-guides, and Fig. 10 is a plan showing the connections to operate our devices at each of the several "headings" at the same time.

Similar letters of reference indicate like parts in each of the several drawings, and the arrows the direction of motion.

The plate C (see Figs. 1 and 2) we usually construct of cast-iron, and provide it with the lug C″, to which lug C″ we secure the retaining spring-pawl G′. We also cast upon the plate C the standard C′, for the purpose of holding the adjustable gage-rod H. This gage-rod H is secured in the standard by the screw *h*. We also cast upon the plate C, or rivet or screw thereto, the center pin or stump, C‴, (see Figs. 1, 2, and 3,) on which the ratchet E is supported and revolves. The operating-lever C⁗ is pivoted upon the stump C‴ and vibrates thereon. We slot the upper end of the center pin or stump, C‴, so as to receive and hold in position the spring F. The outer end of this spring engages the screw F′ in the lever C⁗. The object of this spring is to return the lever C⁗ to its normal position against the guide-rod H. This spring F we make of considerable power and elasticity, as it performs the operation of moving forward the ratchet cam-wheel.

To the under side of the arm A″ of the cylinder-head A we secure the cam-pin B, which engages with and throws out at each revolution of the cylinder the lever C⁗, so as to engage the pawl G with the teeth of the ratchet-wheel. (See Figs. 2 and 3.) Pawl G is held against the teeth by the spiral spring G′.

The ratchet-wheel heretofore referred to we usually construct of cast-iron, and cast or secure thereon with screws the cam E′. This cam may be of any desired length, and, if necessary, more than one may be placed upon the ratchet E. We have shown two in the drawings; but we do not confine ourselves to any given number. This cam ratchet-wheel stand is secured in its proper place upon the table of an ordinary upright circular knitting frame, of which A (see Figs. 1 and 2) is a section of a cylinder, and A′ the ordinary vertical barbed needles.

We construct and secure with the screw *i* upon the ordinary "sinker" and presser stand I (see Figs. 1, 4, 5, 6, and 7) the guide-frame I″.

We construct the standard J substantially as shown, with the lower end rounded, as shown in Figs. 6 and 7, and place it within square holes in frame I″, so as to have a free vertical movement. Upon the inside of this standard J we place the projection *b*, which we will hereinafter more fully describe.

Upon the inner under portion of the frame

I″ we secure, by riveting or otherwise, the hanger *a′*, wherein the pulley *a* revolves. The object of this pulley is to carry the wire or cord *d*, that extends from the projection *b* on the standard J, down over the pulley and branching to the several "headings" of the cylinder, substantially as shown in Fig. 10.

Upon the upper portion of the standard J we secure the thread-guide J′. The normal position of the standard J is shown in Fig. 4 by the broken lines, representing the lower end of the standard resting upon the upper surface of the cam ratchet-wheel E.

The stationary thread-guides I′ are of ordinary construction, excepting they are provided with two thread-holes in their rear portions, and the holes M at their points we make elliptic, substantially as shown in Figs. 4, 8, and 9.

The stationary thread-guide I′, "sinker-burr" K, and needles A′ (see Fig. 4) are shown in their relative position to each other. In Fig. 1 the standard J and thread-guide J′ are shown in their normal position, with the foot of the standard resting upon the ratchet-wheel E. The stationary thread-guide I′ is also shown in its relative position to the sinker-burr, needles, and thread-guide J′. Fig. 10 of the drawings illustrates our devices for producing like results at the remaining headings of the cylinder. We have shown four headings. However, the number may be increased or diminished without changing the nature of our invention.

J (see Fig. 10) is the standard carrying the thread-guide J′. I′ are the stationary thread-guides. L are the movable thread-guides, which we construct and fasten so as to vibrate on the stationary thread-guide I′, substantially as shown in Fig. 8.

I′ and L′ (see Fig. 9) is a view of the ends of the thread-guides, and L indicates the position of L′ when the standard J is elevated by the cam E′.

e e′ (see Fig. 10) are bell-cranks vibrating upon the pins *f*. *d* is a cord or wire that is connected to the projection *b* on the standard J, and extends down around the pulley *a*, and branches to the bell-cranks *e e′* and the leg of the thread-guide L at the heading upon the opposite side. *d′* are wires or cords that form the connections between the bell-cranks *e e′* and the legs of the thread-guides L.

We interpose a spiral spring, *p*, between each thread-guide L and the table of the frame, to cause the thread-guides L to return to their normal positions, all substantially as shown in Fig. 8.

It may be well here to observe that the knitting-frame of the ordinary kind referred to is provided with burrs, pressers, cast-off wheels, &c., which are so well understood by those skilled in the art that we deem it unnecessary to refer to any of these parts, excepting so much thereof as may be necessary to describe our invention.

The operation of our invention is as follows: Motion is communicated to the several parts, as indicated by the arrows, and the yarn fed in at the several "quarters" or headings, as indicated, described, and shown. The pin B, attached to the arm A″, at each revolution of the cylinder comes in contact with the lever C″″, thereby causing it to move backward a sufficient distance to allow the pawl G to engage one or more teeth of the ratchet E. When the pin B passes the end of the lever C″″ the spring F causes the lever to return to its normal position against the gage-rod H, thereby causing the ratchet-wheel to revolve a corresponding distance. Retaining spring-pawl G′ engages the teeth of the ratchet as it is driven forward, thereby preventing a reverse movement. As the ratchet-wheel moves forward the incline of the cam E′ comes in contact with the foot of the standard J and gradually presses under it, thereby elevating the standard upon the upper surface of the cam E′. By this movement the thread-guide J′ is raised from the position indicated by J″ in Fig. 4 to the position indicated in the same figure at J′. By this movement the black yarn which was being fed under the barbs of the needles, through the lower part of the elliptic hole M in stationary guide I′, beneath the white yarn, is fed under the barbs of the needles, through the upper portion of the elliptical hole M in I′, above the white yarn, which causes the stitches to be formed with the black yarn in the upper portion of the needles, which, when the new loops are formed therefrom and thrown off, throws the dark stripe upon the "right" side of the cloth. The reversing of the positions of the threads causes the white yarn to take the place of the black in the upper portions of the needles, which, when the new loops are formed, throws the white stripe on the right side of the web, these two movements producing alternate black and white stripes in the fabric. By this last-described upward movement of the standard J the cord or wire *d*, attached to the projection *b*, is drawn upward, thereby drawing in on the bell-cranks *e e′*, (see Fig. 10,) and through the connections *d′* and the cross-wire *d″*, each attached to their respective leg of the yarn-guides L, as indicated at *g*. (See Fig. 8.) By this movement the three remaining movable thread-guides L at the headings referred to are elevated, at the same time that thread-guide J′ is, from the position indicated at L′ (see Figs. 8 and 9) to the position indicated at L in said figures. When the cam E′ passes the foot of the standard J it falls back to the position first above described by its specific gravity and united action of springs *p*, causing the thread-guides L to assume their former positions, as shown, thereby causing the dark-colored yarn at the four headings to be fed in through the lower portion of the elliptic hole N in the thread-guide I′ and beneath the white thread, as heretofore set forth.

By the use of our special improvements circular knit fabric is produced with circumferential shaded stripes or sections, which add to

the beauty and value of the goods manufactured from the same.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The standard J, provided with the projection *b*, hanger *a'*, thread-guide J', and pulley *a*, combined with a series of stationary thread-guides, I', and movable thread-guides L at the several headings or "feeds" of the springs *p*, the connections *d d' d''* and *e e'*, and mechanism for operating said standard J, all constructed and operating substantially as set forth.

2. The cylinder A, provided with the needles A' and pin B, sinker-burr K, lever C'''', pawl G, spring F, plate C, having lugs C' and C'' attached thereto, stump C''', and gage-rod H, the spring-pawl G', ratchet-wheel E, containing the cams E', sinker-stand I, guide-frame I'', provided with the hanger *a'* and pulley *a*, standard J, having attached thereto the thread-guide J', the series of stationary thread-guides I', and movable thread-guides L at the several headings or quarters, and devices for connecting said movable guides L with the standard J, consisting of the wires or cords *d*, *d'*, and *d''* and bell-cranks *e e'*, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWARD McDONNELL.
JAMES H. SHERWOOD.

Witnesses:
W. DAVIDSON JONES,
DENNIS SWEENEY.