

G. W. CUMMINGS.
Knitting-Machines.

No. 148,937.

Patented March 24, 1874.

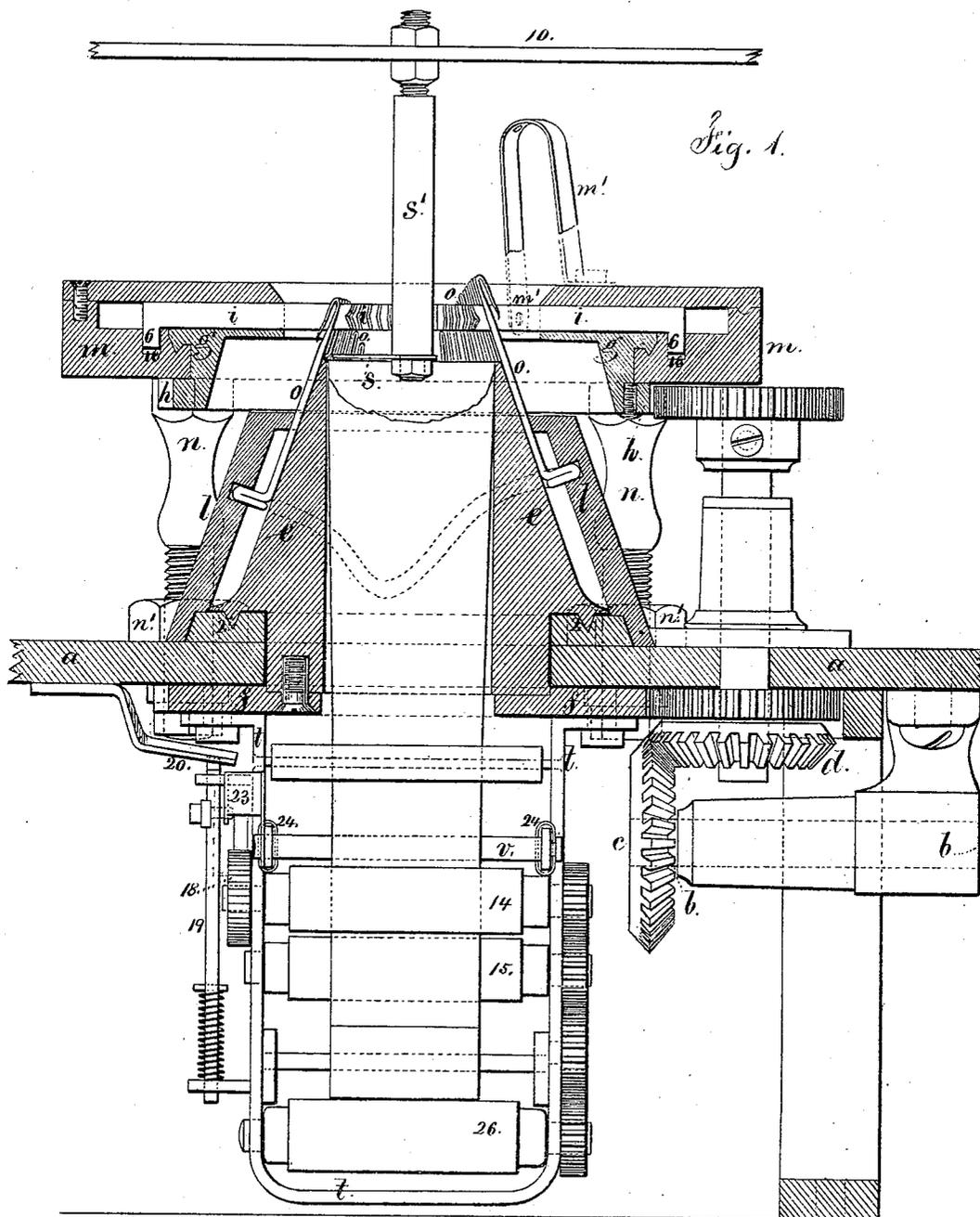


Fig. 1.

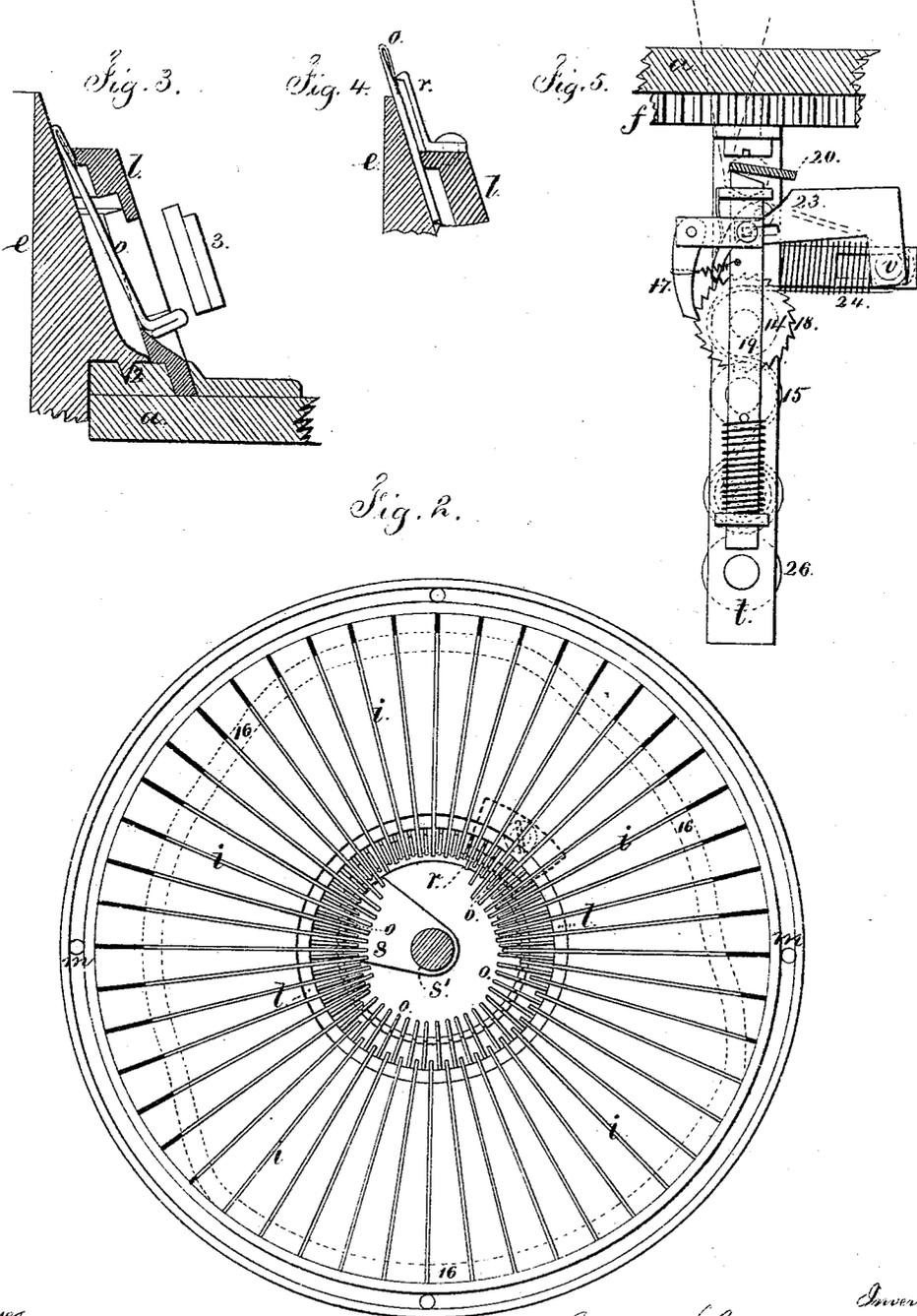
Witnesses
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Inventor
 George W. Cummings
 per Lemuel N. Lovell.
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UNITED STATES PATENT OFFICE.

GEORGE W. CUMMINGS, OF COHOES, NEW YORK.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **148,937**, dated March 24, 1874; application filed September 27, 1873.

To all whom it may concern:

Be it known that I, GEORGE W. CUMMINGS, of Cohoes, in the county of Albany and State of New York, have invented an Improvement in Knitting-Machines, of which the following is a specification:

My improvement relates to a means for sustaining and adjusting the movable radial sinker-plates that carry the yarn into the hooks of the needle and hold the same in a regular and uniform position until the loops draw into the hooks.

I make use of a cylinder or cone, that revolves and carries the needles, and these are moved up and down by a cam-groove in a stationary jacket. The radial sinker-plates are within a ring-plate that is outside the range of needles and revolves in unison with them. The radial sinker-plates pass in between the needles, and the thread or yarn is supplied through a stationary eye against the outer surfaces of the needles just below the barbs, and the radial sinker-plates are forced in successively by an adjustable cam and hold the loops of thread in definite positions while the needles draw down. Thereby the thread or yarn passes reliably into the barb, and that is closed, and the further downward movement casts the previous loops off the needle. The knitted fabric is drawn down by a take-up apparatus that revolves with the fabric.

In the drawing, Figure 1 is a section of the knitting mechanism and elevation of the take-up. Fig. 2 is a plan of the radial sinker-plates and needles; and Fig. 3 is a section of the stationary jacket and needle-cone, where the needles can be removed for replacing injured ones.

The bed *a* of the machine is supported upon suitable legs, or clamped to a table. The motive power is applied to a shaft, *b*, that is driven by a crank, or otherwise; and, by the wheels *c* and *d*, revolves in unison the wheel *f* of the needle-cone *e*, and the wheel *h* of the ring-plate *g*, carrying the radial sinker-plates. The wheel *f* is below the bed *a*, and is connected by screws to the base of the needle-cone *e*, and this needle-cone is made with an annular rib, 2, setting in a groove in the upper surface of the bed *a*, so that the cone can be revolved freely. The surface of the cone *e* is grooved

vertically for the reception of the needles *o*, and these needles are of usual character, and the foot of each needle runs in a cam-groove upon the inside of the conical jacket *l*, that is stationary and supported by the bed *a*. The cam-groove in this jacket is shaped so as to give the proper end movement to the needles to elevate them above the end of the needle-cone for receiving the yarn, and draw them down below the said end of the cone for casting off the loop. At one side of the conical jacket *l*, there is a groove extending downward from the under side of the cam-groove, and into this is placed the removable block 3. When this block is taken out, as seen in Fig. 3, the needles can be removed or introduced endwise through this groove. The ring-plate *g* is within an annular case, *m*, that is supported by columns *n*, and said ring can be raised or lowered bodily, together with the radial sinker-plates, for the purpose of properly positioning the thread to the beards of the needles. This adjustment may also be availed of for lengthening or shortening the loops, as hereafter explained.

The ring-plate *g* and wheel *h* are screwed together, and the deep radial grooves in the plate *g* receive the sinker-plates *i*, and each plate has a projection or foot, 6, that enters a cam-groove, 16, in the upper surface of the annular case *m*; and this groove is shaped as shown by dotted lines in Fig. 2, so as to force the sinker-plates in between the needles contiguous to the place where the yarn or thread is supplied through a stationary eye, and in so doing form the loops of yarn; and the cam-groove from this point is nearly concentric, so as to hold the loops of the definite length while the needles draw down; hence the yarn will pass reliably into the barbs of the needles, after which the stationary barb-closer *r* operates to hold the barbs closed as the previous loops pass over such barbs, and then the needles, continuing to draw down, cast off such loops, and the fabric as knitted passes down through the open needle-cone. The barb-closer *r* is shown in the sectional view, Fig. 4, and by dotted lines in Fig. 2.

It will now be evident that, the needles standing conically, the radial sinker-plates will force the yarn farther in and make longer loops when the case *m* and such plates are

lowered bodily by adjusting the nuts *n'* of the columns, and that the loops will be shortened when the said case and plates are raised.

The yarn-eye *m'* is supported by the top plate of the case *m*, and the plate *s* at the upper end of the needle-cone prevents the fabric rising as the needles are forced up through the loops. This plate *s* is upon the bar *s'* and yoke 10, so as to be held stationary.

Some of the devices described may be duplicated whenever the number of needles is sufficient to admit of the knitting being performed at two, three, or more points around the range of needles, so as to use two, three, or more yarns or threads. In these cases the eyes for the yarn will be placed accordingly, and the cam-grooves in the stationary jacket and the bottom of the case *m* are to be made to draw down the needles, and to project the radial sinker-plates at as many places as there are thread or yarn eyes, and in the proper positions relatively to such eyes.

In order to draw the fabric down as it is knitted, I use the devices shown in Figs. 1 and 5; which consist of the frame *t*, attached to the wheel *f*, and carrying the rollers 14, 15, and 26, that are geared together so as to move in unison, and to one of these rollers, 14, a partial rotary movement is communicated periodically by a pawl, 17, ratchet-wheel 18, and sliding pawl-carrier 19, that is moved by coming into contact with the incline or stop 20 on the bed *a*.

To prevent this mechanism operating except when the fabric requires to be taken up, I em-

ploy the laterally-yielding roller *v* and sliding incline 23, connected to the pawl-carrier by a slot and pin, and I pass the knitted fabric around this roller *v* before it passes in between the rollers 14 and 15, so that when the rollers 14 and 15 have drawn the fabric along sufficiently to move the roller *v* laterally against the springs 24, and move the incline 23, said incline will force the pawl-carrier down and prevent its being raised by its spring, and hence it will not strike the inclined stop 20 and move the ratchet-wheel 18 the distance of another tooth; but said wheel and the rollers will simply hold the fabric until its length is increased sufficiently for the roller *v* to move back and allow the pawl-carrier to act as before.

The fabric may be wound upon a roller that rests upon the roller 26, and is guided at its ends in slots in the frame.

I claim as my invention—

1. The annular case *m*, supported by the adjustable columns *n*, in combination with the sinker-plates *i* and needle-cone *e*, substantially as and for the purposes set forth.

2. The frame *t*, attached to the wheel *f*, and provided with the rollers 14, 15, and 26, in combination with the incline 23, laterally-moving roller *v*, and pawl-carrier 19, as specified.

Signed by me this 20th day of September, A. D. 1873.

G. W. CUMMINGS.

Witnesses:

W. T. DODGE,
CHAS. E. WILBRICK.