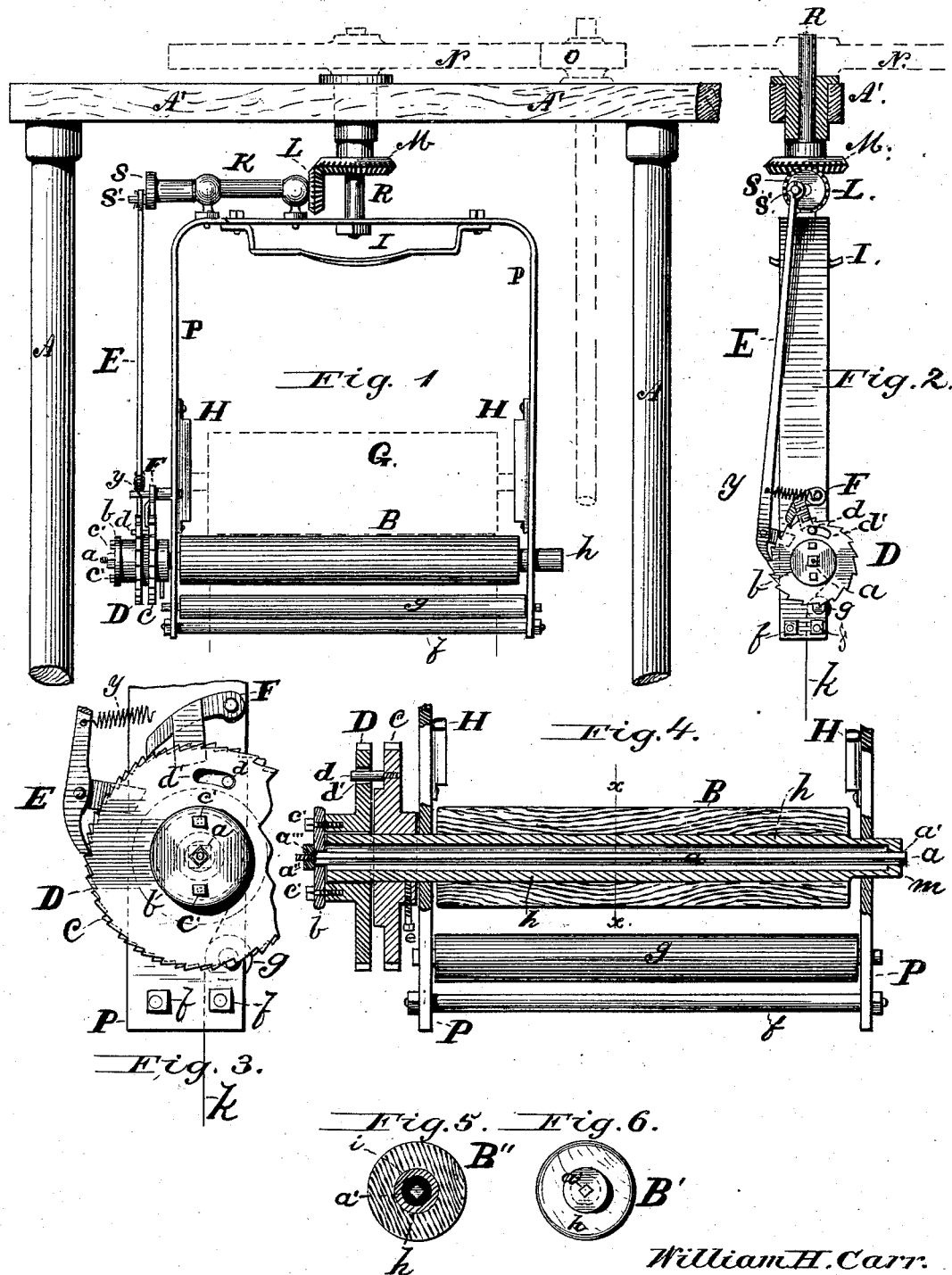


W. H. CARR.
Take-Up for Knitting-Frames.

No. 216,655.

Patented June 17, 1879.



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UNITED STATES PATENT OFFICE

WILLIAM H. CARR, OF LANSINGBURG, NEW YORK.

IMPROVEMENT IN TAKE-UPS FOR KNITTING-FRAMES.

Specification forming part of Letters Patent No. **216,655**, dated June 17, 1879; application filed April 19, 1879.

To all whom it may concern:

Be it known that I, WILLIAM H. CARR, of Lansingburg, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Take-Ups for Knitting-Frames; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is an end elevation. Fig. 3 is a sectional end elevation. Fig. 4 is a longitudinal sectional elevation on a vertical line of the center of the roll B. Fig. 5 is a cross-section of the roller B on the line *x x*, Fig. 4; and Fig. 6 is an end view of the right-hand end of roll B.

The invention relates to an improved take-up for circular-knitting frames.

The object of my invention is to provide a system of parts by which the circular web knitted on a circular frame may be taken up as fast as knitted, and the tension or strain on the cloth maintained automatically throughout the whole operation, and also susceptible of a variable tension—that is, from a tension of a given power, which it will maintain automatically, down to a tension of a much less power, which it will also maintain automatically.

On the columns A is secured the cross-bar A', by bolts or otherwise, and centrally in this cross-beam A' is formed a hole, through which the hub of the wheel M passes. Within the center of this hub and wheel M is a proper hole to receive the shaft K, having attached to its upper end the gear-wheel N, which gear-wheel N is driven by the pinion O, by any suitable prime motor, through the medium of the shaft that carries the said pinion O.

The frame P carries the working parts of my invention.

The gear-wheel N and the frame P are attached rigidly to the shaft K, and revolve together, while the bevel-gear M remains stationary.

The frame P, constructed substantially as

shown, carries and supports the shaft K, having thereon the bevel-gear L and the disk S, with the wrist-pin S' therein. I is a basin for catching any waste oil that might drop from the gears M and L or shaft K.

h (see Figs. 1, 4, 5, and 6) is a hollow shaft, having fastened thereon permanently the roller B. The outer end, *m*, of said shaft *h* is closed up, substantially as shown at *m*, excepting the small square hole *a'* in the center. (See Fig. 6.)

Upon the opposite end from *m* is fastened permanently the ratchet-wheel *c* by the set-screw *e*. Close to the side of ratchet-wheel *c* is placed a corresponding ratchet-wheel, D, having on the outer end of the hub of the same the disk *b*, held thereon by the set-screws *c' c'*, and having also in the center of said disk *b* a square hole, *a'''*, to correspond with the hole *a'* in the opposite end of the said shaft. This ratchet-wheel D is loose upon the shaft *h*, and is held thereon lengthwise by the nut *a''*. This ratchet-wheel D is provided with a slot, *d'*, substantially as shown in Figs. 2, 3, and 4, which slot describes the arc of a circle around the center of the hollow shaft *h*. In the ratchet-wheel *c* is placed permanently a pin or stud, *d*, (see Figs. 1, 2, 3, and 4,) which pin or stud extends through the slot *d'*.

F is a pawl which engages with the ratchet-wheel *c*. E is a pawl that is connected to the wrist-pin S', and engages with the ratchet D. *f f* are cross-rods to support and form part of the frame P. *g* (see Figs. 1, 2, 3, and 4) is a guide-roller that revolves loosely in bearings in frame P. H H are vertical guides, that hold into position the roll of cloth on the take-up roll G as it is wound into a roll by the frictional contact with the roll B.

The operation of my invention is as follows: The cloth from the cylinder is brought up over a suitable spreader, so as to flatten the web into a flat sheet, and is carried up, as indicated by the line *k*, (see Figs. 2 and 3,) partially over the roll *g*, onto the roll B, where it is pressed down tightly by the weight of the take-up roll G, around which it winds.

The proper strain or tension upon the cloth *k* is obtained by adjusting the ratchet-wheel *c* upon the hollow shaft *h*, so as to give the desired torsional strain upon the small square

rod *a*, that extends from the disk *b*, through the hollow shaft *h*, into the square opening *a'* in the other end of the said shaft *h*. (See Figs. 1, 2, 3, 4, 5, and 6.)

As the cloth is knitted the motion of the frame causes a reciprocating motion to the pawl *E* by the shaft *K* being revolved by the bevel-gear *L* thereon meshing into and with the stationary bevel-gear *M*.

The normal position of the two ratchet-wheels *D* and *c* is shown in Fig. 2, the pin *d* being close to the forward part of the slot *d'*. The positive speed of the ratchet-wheel *D* is equal to the speed of the pawl *E*. The speed of the cloth as it comes from the knitting-cylinder should be a little less than the speed of the surface of the roll *B*, and the variation between the two is accommodated by the torsion of the rod *a*, which if there is not cloth enough to take up a notch or tooth on the ratchet-wheel *c*, to be held by the pawl *F*, the torsion-rod *a* yields or twists sufficiently by the action of the pawl *E* on ratchet *D*, and as the pawl *E* makes the reverse movement the torsion of the rod *a* causes the ratchet *D* to return to the position that it occupied before the stroke just alluded to, and if there is not cloth enough knitted by another revolution of the knitting-frame, the same results are again produced; but if, upon another revolution of the frame, there is sufficient cloth knitted, the action of the pawl *E* on ratchet *D* being continued, the strain upon the rod *a* is thereby released by the excess of cloth, which causes the roll *B* to revolve forward, so as to take up a notch on the ratchet *c* by the pawl *F*, and if there is cloth enough knitted upon another revolution the same operation is repeated; but if there is a deficiency of cloth, which must cause a greater torsional strain upon the rod *a*, the roll *B* will not move forward in unison with the ratchet *D*, but instead thereof the rod *a*, by its torsional qualities, will yield between the end at *a'*, and the other end at *a''*, thereby allowing the ratchet *D* to move forward without carrying with it the roll *B*, and when the pawl *E* moves backward the ratchet-wheel *D* will follow it back.

The excess of strain on the cloth, as above stated, will hold the roll *B* from turning forward, while the pawl *E* will compel the ratchet-wheel *D* to move forward, thus passing the slot *d'* lengthwise over the pin *d* in ratchet *c*; and as the pawl *E* makes the backward or return movement, the ratchet *D*, by the action of the torsion-spring, will move back with it until sufficient cloth is knitted, so as to lessen the tension or strain upon the roll *B* by the cloth, and allow it and the ratchet *c* to go forward in the same direction with ratchet *D*, thereby passing a notch or tooth on ratchet *c*, which is engaged and held by pawl *F*.

The roll *B* may be covered with a coating of coarse emery, or any other suitable material, to cause sufficient friction.

The torsion-rod *a* may be made round instead of square, and the ratchet-wheel *c* may be placed upon the opposite end of the shaft *h*, and the accompanying pawl *F* be placed upon the same side of the frame *P*, to engage it, without changing the nature of my invention.

Also, the teeth of the ratchet-wheel *c* may be made much finer—say, any number that will subdivide by the number of teeth in the outer wheel, *D*—without changing the nature of my invention.

The advantages of my improvements consist in the great perfection of its work—that is, the perfect equal strain or tension of the cloth upon the needles, which has not heretofore been accomplished in so perfect a manner; also, the extreme lightness of the working parts, in comparison to the amount of work to be performed, has never heretofore been attained, which is especially desirable in knitting-machines of this class.

Having described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a take-up mechanism for circular-knitting frames, the combination of a hollow shaft having thereon at one end a tight and a loose ratchet, said tight ratchet being provided with a pin or stud, and the outer or loose ratchet provided with a corresponding slot to receive the pin, and a disk on its hub having a central hole to receive and hold a torsion-spring, said torsion-spring extending entirely through the hollow shaft and fastened to the opposite end thereof, all substantially as shown and described.

2. In a take-up mechanism for circular-knitting frames, the combination of the frame *P*, hollow shaft *h*, having thereon the roll *B*, ratchet-wheels *D* and *c*, provided respectively with the slot *d'*, pin *d*, pawls *F* and *E*, and means for operating said pawl *E*, spiral spring *y*, and torsional spring *a*, placed within the hollow shaft *h*, all operating as and for the purposes substantially as shown and described.

3. In a take-up mechanism for circular-knitting frames, the combination of the frame *P*, gear-wheels *M* and *L*, shaft *K*, disk *S*, wrist-pin *S'*, hollow shaft *h*, having thereon the roll *B*, and ratchet-wheels *D* and *c*, provided respectively with the slot *d'*, pin *d*, pawls *F* and *E*, and means for operating said pawl *E*, spiral spring *y*, roll *g*, and torsional spring *a*, placed within the hollow shaft *h*, all operating as and for the purposes substantially as set forth, shown, and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLIAM H. CARR.

Witnesses:

JOHN CLUTE,

W. DAVIDSON JONES.