

G. JACKSON.
Take-up for Knitting-Machines.

No. 195,929.

Patented Oct. 9, 1877.

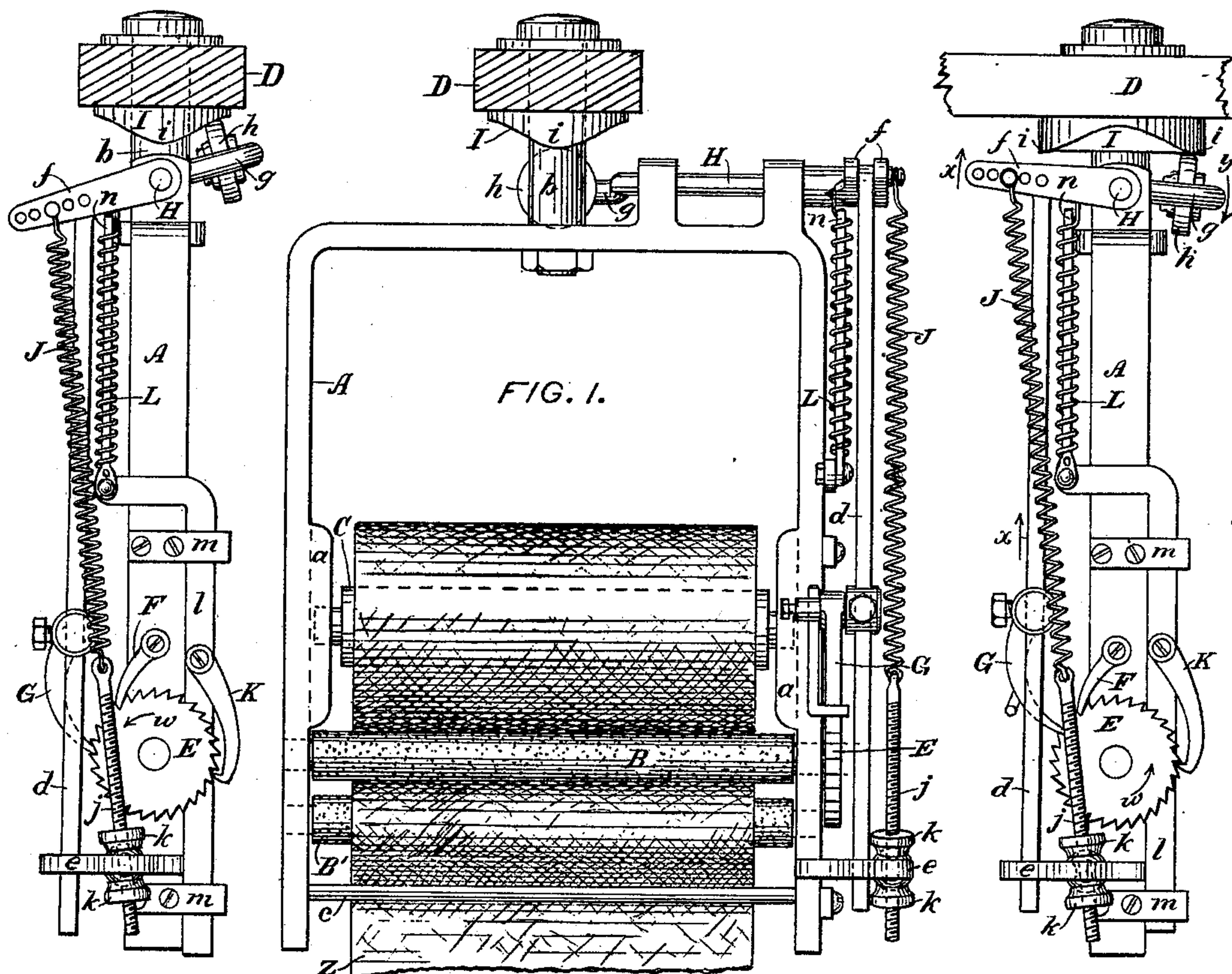


FIG. 3.

FIG. 2.

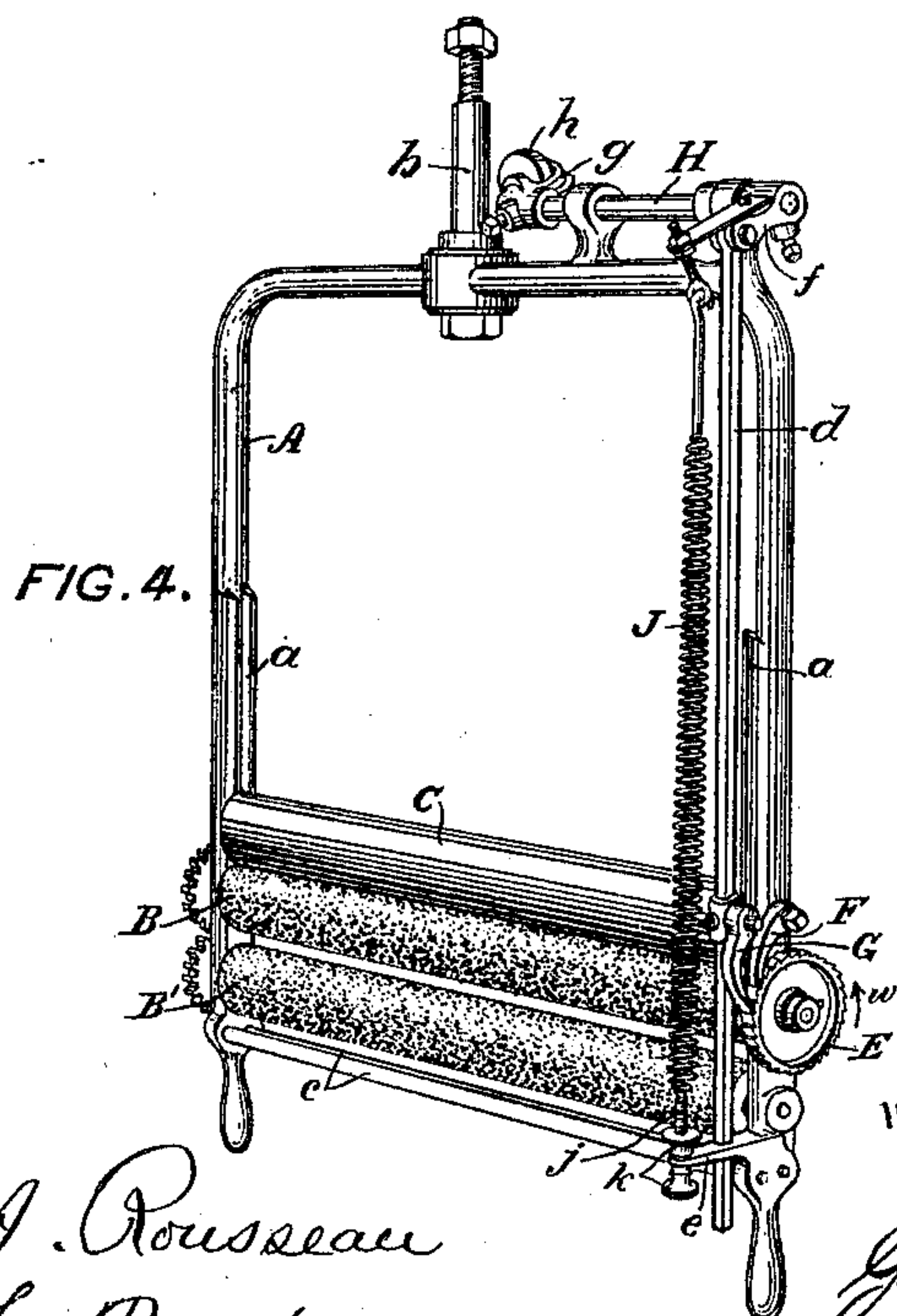


FIG. 4.

WITNESSES:

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GEORGE JACKSON, OF COHOES, NEW YORK, ASSIGNOR TO JAMES E. JACKSON,
OF SAME PLACE.

IMPROVEMENT IN TAKE-UPS FOR KNITTING-MACHINES.

Specification forming part of Letters Patent No. **195,929**, dated October 9, 1877; application filed
December 28, 1876.

To all whom it may concern:

Be it known that I, GEORGE JACKSON, of the city of Cohoes, in the county of Albany and State of New York, have invented certain new and useful Improvements in Rotary Take-Up Mechanisms for Circular-Knitting Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, and Figs. 2 and 3 end elevations, of a take-up mechanism which embodies this invention; and Fig. 4 is a perspective view of a mechanism that embodies a portion thereof.

This invention relates to the class of take-up mechanisms in which a reciprocating or vibrating driving-pawl turns with a step-by-step movement, a ratchet-wheel that is connected to a rough tension roller or rollers, so as to turn the latter, and thereby draw off the flattened tubular fabric from the needle-cylinder and wind the fabric on an incumbent roller in a frame which is revolved about an axis in line with that of the needle-cylinder, and with the same speed as the latter, and which frame, by its rotation, causes the reciprocating movements of the said driving-pawl by mechanical means.

In some take-up mechanisms of this class heretofore made the driving-pawl was moved forward by means of unyielding devices, so as to turn the ratchet-wheel and tension roller or rollers with a positive movement during each step, and was moved backward by a spring, so that in such cases the taking-up of the fabric was positive throughout each step, and the tension on the fabric was therefore quite irregular and uneven.

In another case the driving-pawl was moved backward, to take hold of the teeth of the ratchet anew, by the positive action of a crank and pitman, and was moved forward by the same crank and pitman acting through a spring, so as to thereby turn the ratchet and take-up roller with a varying elastic pressure, which was positively increased and lessened during each step-movement by the action of the crank and pitman in first compressing the spring, and thus producing greater tension on the

fabric, and afterward relaxing the spring, and thereby lessening that tension.

The general object of my present invention is to produce a simple, cheap, and durable take-up mechanism, which shall be capable of giving more even tension to the fabric than the above-mentioned take-up mechanisms heretofore used.

One part of this invention consists in the combination of a rotary take-up frame, a tension-roller, and an incumbent take-up roller supported in and revolved with and by the take-up frame, a ratchet-wheel secured to the tension-roller and furnished with a detent and a driving-pawl, a mechanism which, by the rotation of the take-up frame, causes the retraction or backward movement of the driving-pawl whenever necessary to take hold of the teeth of the ratchet anew, and a spring connected to the driving-pawl or its retracting mechanism, so as to cause the forward movement of the driving-pawl, and thereby the forward turning of the ratchet-wheel, tension-roller, and take-up roller, and the consequent drawing off and taking up of the flattened tubular elastic knitted fabric with a regulated elastic tension, by the action of the spring, substantially as hereinafter described.

Another part of this invention consists in the combination, with the rotary take-up frame, tension-roller furnished with a ratchet-wheel, main driving-pawl, and mechanism for actuating the latter, of an additional driving-pawl connected with the actuating mechanism by a spring, and arranged so as to act against and turn the ratchet-wheel and tension-roller, and thereby take up the fabric with a yielding tension while the main driving-pawl is moving back to take hold of the teeth of the ratchet-wheel anew, and consequently give more nearly continuous and even motion to the tension-roller and tension to the fabric than if only the main driving-pawl should be used.

In the aforesaid drawing, A is the frame in which the rough tension-roller B is mounted. C is a roller which rests on the roller B, with its journals between guides *a a* on the frame, so that the flattened tubular knitted fabric Z will be wound on the roller C, as represented

in Fig. 1. Another rough roller, B', may or may not be arranged below and geared with the roller B, so as to turn against the other side of the knitted fabric with the same surface speed as the latter roller. The take-up frame A has a central supporting-shaft, *b*, which is journaled to turn in a socket in a part, D, of a stationary frame that is to support the rotary needle-cylinder with its axis in line with that of the shaft *b* of the take-up frame; and the take-up frame is to be revolved with the same speed as the needle-cylinder by means of gearing connecting the needle-cylinder with the spindle *b* outside of the tubular fabric in the ordinary well-known manner, or by means of an extension from or through the needle-cylinder within the fabric, to and between rods *c* in the lower part of the take-up frame, as heretofore commonly practiced, or by any other suitable means.

E is a ratchet-wheel fast on the shaft of the tension-roller B, and F is a detent pivoted to the frame A, and arranged to engage with the teeth of the ratchet-wheel, so as to prevent the turning of the latter except in the direction required to take up the fabric. G is a driving-pawl arranged to engaged with the ratchet-wheel E, and pivoted upon a rod, *d*, which is arranged to slide to and fro endwise through a part, *e*, of the frame A, and is pivoted to an arm, *f*, of a rock-shaft, H, which is mounted on the frame A, and has an arm, *g*, furnished with a friction-roller, *h*, and is arranged so as to be moved positively, as by a fixed cam, I, in one direction only, as the frame A revolves, its movement in the opposite direction being accomplished by a tension-spring, J, connected at one end to the frame A, and at the other end to the arm *f*, actuating the rod *d* and pawl G, so that the spring J constantly tends to move the pawl G in the direction required to turn the ratchet E and roller B to take up the fabric.

With that construction shown in the several figures, when the needle-cylinder and the take-up frame A are revolving together, and the knitting is progressing as usual, the arm *g* of the rock-shaft H is quickly moved in the direction indicated by the arrow *y*, Fig. 2, by striking against the projecting part *i* of the fixed cam I, so as to thereby move the arm *f* and rod *d*, with the pawl G, in the direction pointed by the arrow *x*, Fig. 2, and thereby positively move the pawl G backward a step, in opposition to the pressure of the spring J, so as to take hold of the teeth of the ratchet anew, and just as soon as the arm *g* leaves the projecting part of the cam I the spring J alone, by its own tension, presses the pawl G forward, so as to gradually turn the ratchet E and roller B in the direction indicated by the arrow *w*, and thereby take up the fabric with a yielding tension, which is given by the spring J alone, and is thereby continued until the arm *g* again strikes the cam I, and consequently forces

back the pawl G, to again take hold of the ratchet-teeth. The spring J has at one end a screw, *j*, and nuts *k*, by which the pressure of that spring can be adjusted so as to produce any desired degree of tension on the fabric.

K is a supplemental driving-pawl that is applied to the ratchet-wheel E, and is pivoted to a rod, *l*, which is fitted to slide to and fro endwise in bearings at *m* on the frame A, and is connected to the arm *f* of the main driving-pawl G by a tension-spring, L, and has a part, *n*, extended to the arm *f*, but separate therefrom, all in such manner that while the pawl G is being moved, so as to turn the ratchet E and roller B in the direction pointed by the arrow *w*, the pawl K shall at the same time be moved backward, to take hold of the teeth of the ratchet, by reason of the arm *f* being against the part *n* of the carrier *l*, as in Fig. 3, and so that while the pawl G is not turning the ratchet E, but is being moved back to take hold of the teeth of the ratchet, the part *n* of the carrier of the pawl K will then be separated from the arm *f*, as shown in Fig. 2, so that the tension of the spring L shall then move the pawl K, so as to thereby gradually turn the ratchet E and roller B in the direction of the arrow *w*, and thereby take up the fabric with a yielding tension.

By thus connecting the additional driving-pawl K with the main driving-pawl G, through the intervening spring L, the ratchet E and roller B will be almost constantly turned, and the fabric thereby taken up almost continually with a yielding tension, by the action of the spring J and pawl G alternating with that of the spring L and pawl K.

In carrying out this invention, the frame A may, by its rotation, give to the pawl G a positive backward movement in the direction of arrow *x*, to take hold of the ratchet-teeth anew, and in opposition to the pressure of the spring J, by means of any suitable known or equivalent device other than the fixed cam I, rock-shaft H, with its arms *f* *g*, and the sliding rod *d*; and the spring J may be secured at one end to the frame A, and at the other end to the pawl G, either directly or through intervening connections.

What I claim as my invention is—

1. The combination of the rotary take-up frame A, tension-roller B, and incumbent take-up roller C, carried and revolved by and with the take-up frame, ratchet-wheel E, secured to the tension-roller, detent F, driving-pawl G, mechanism which, by the rotation of the take-up frame, causes the backward movement of the driving-pawl, and spring J, connected to the rotary take-up frame, and to the retracting mechanism of the driving-pawl, all constructed and arranged substantially as described.

2. In combination with the rotary take-up frame, tension-roller, ratchet-wheel, main driving-pawl, and its actuating mechanism, the

additional driving-pawl K, connected with the actuating mechanism by a spring, L, substantially as described, so that the additional driving-pawl shall turn forward the ratchet-wheel and roller, and thereby take up the fabric with an elastic tension while the main driving-pawl shall be moving backward to take hold of the teeth of the ratchet-wheel.

In testimony whereof I hereunto set my hand, in the presence of two subscribing witnesses, this 22d day of December, 1876.

GEORGE JACKSON.

Witnesses:

WILLIAM A. ROUSSEAU,
AUSTIN F. PARK.