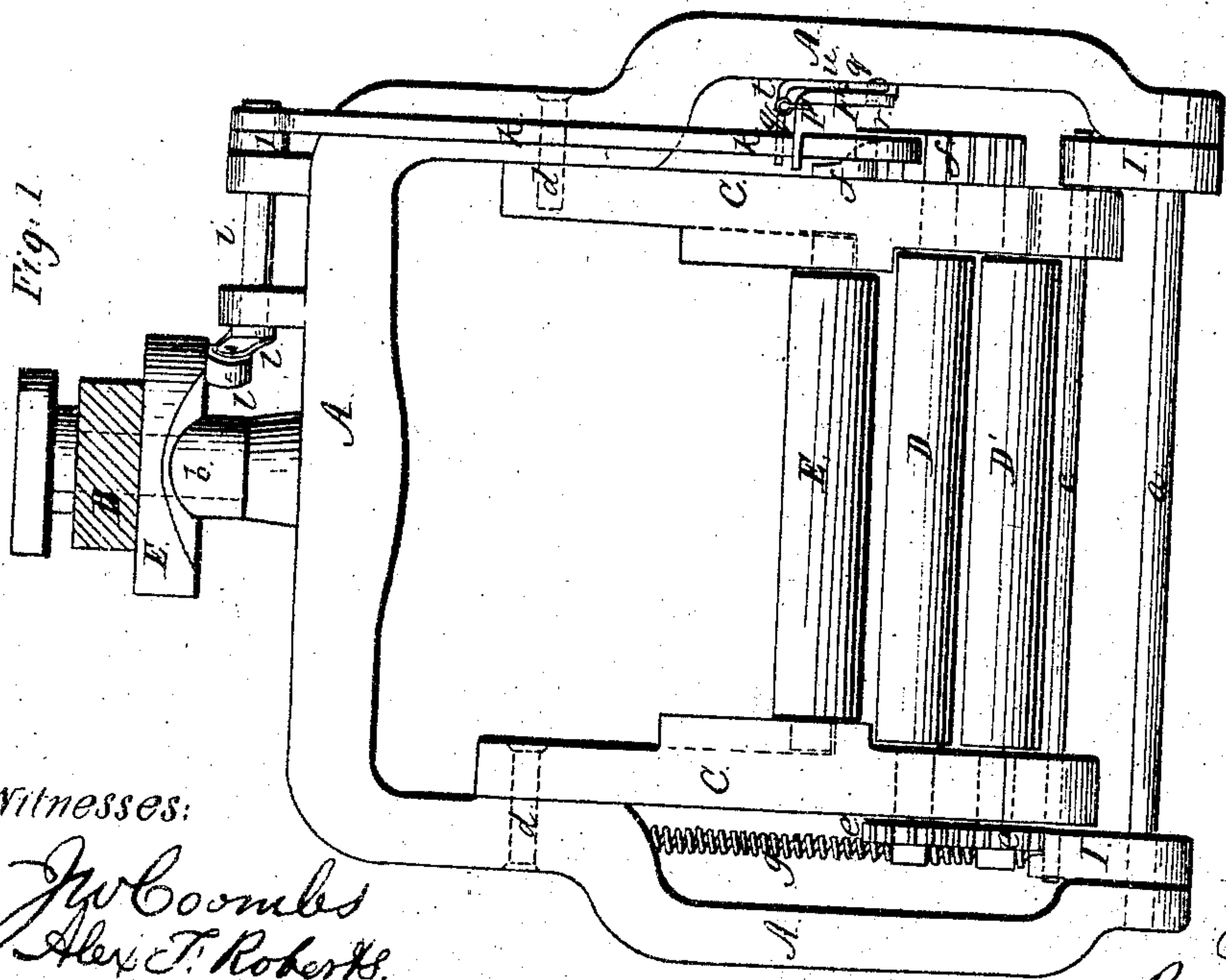
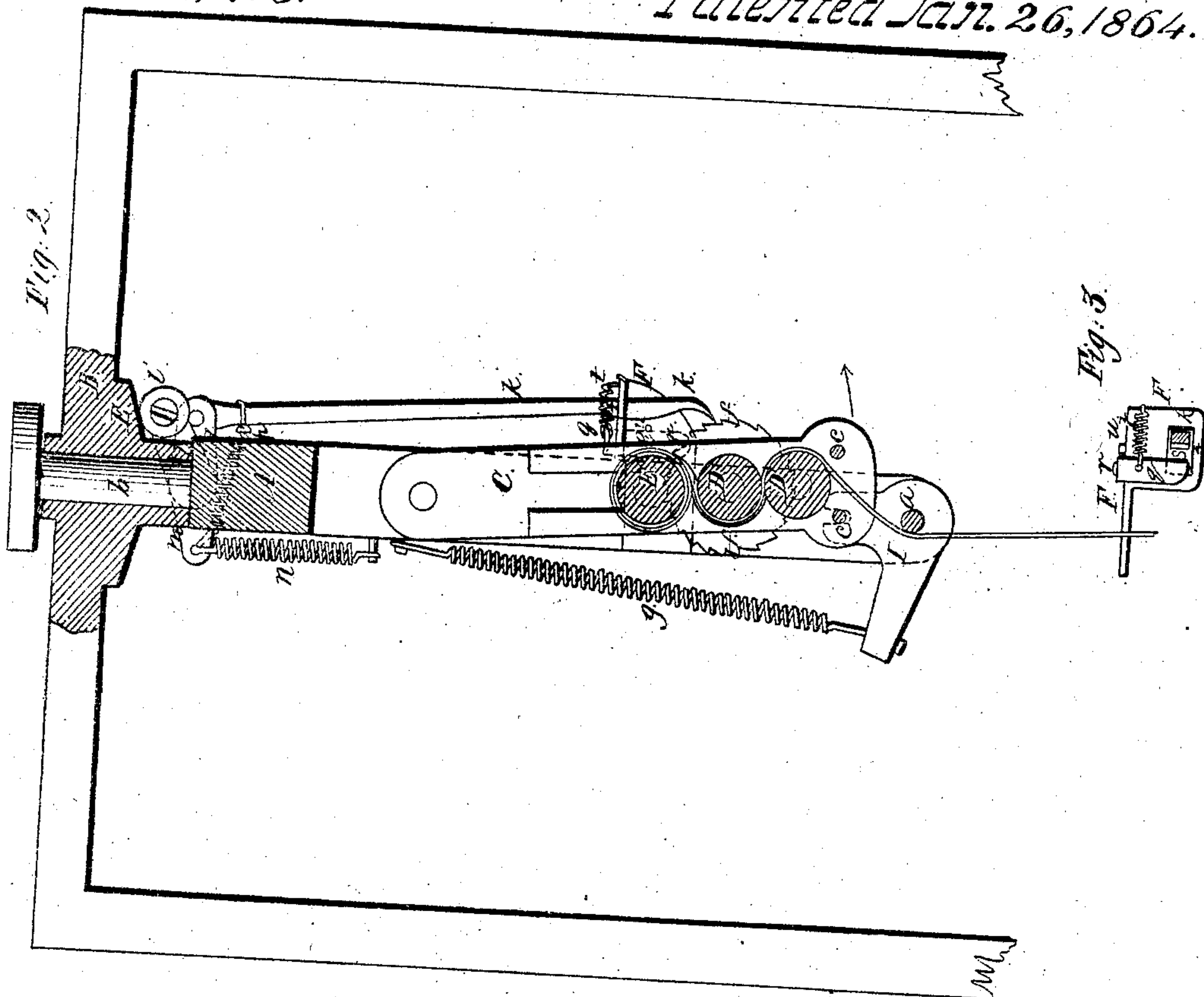


S. Ward.
Knitting Machine Take-up.

N^o 41,415.

Patented Jan. 26, 1864.



Witnesses:

J. W. Coombs
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Inventor.

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UNITED STATES PATENT OFFICE.

SAMUEL WARD, OF AMSTERDAM, ASSIGNOR TO GEORGE CAMPBELL AND JOHN CLUTE, OF COHOES, NEW YORK.

IMPROVEMENT IN TAKE-UPS OF CIRCULAR-KNITTING MACHINES.

Specification forming part of Letters Patent No. 41,415, dated January 26, 1834.

To all whom it may concern:

Be known that I, SAMUEL WARD, of Amsterdam, in the county of Montgomery and State of New York, have invented a new and useful Improvement in the Take-Ups of Circular-Knitting Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of the take-up. Fig. 2 is a central vertical section of the same at right angles to Fig. 1. Fig. 3 is a plan of a portion of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the take up of that class of circular-knitting machines in which the needle-plate or needle-ring has a rotary motion about its axis; and it consists in certain means of controlling the operation of such a take-up by the tension of the knitted goods, whereby all parts of a piece of goods are made uniformly of any desired texture or tightness.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A *a* is an iron frame suspended by means of an upright central journal, *b*, at its top in a bearing in a standard, B, which is erected on the top of the knitting-machine, the axis of the said bearing being directly in line with the axis of the knitting-machine.

C *c* is a frame arranged to swing within the frame A *a* upon two horizontal pivots, *d d*, by which it is attached to the sides thereof. The frame C *c* contains the pair of take-up rolls D D' and the cloth roll E, to which the goods are delivered by the take-up rolls as fast as knitted. The take-up rolls D D' are geared together by gears *e e* at one end, and D is furnished at its opposite end with a ratchet-wheel, *f*, to which there is applied a stop-pawl, *f'*. One of the two lower rails, *c*, of the frame C *c* is connected with the frame A *a* by the upper arms of two elbow-levers, I I, one on each side, the said levers having for their fulcrum the lower rail, *a*, of the latter frame, and the lower arms of said levers being connected by two springs, *g*—one for each—with the upper part of the frame, and the

said springs and levers tend to draw or press the frame C *c* in the direction of the arrow shown near the lower part of the said frame in Fig. 2, so that the knitted goods in passing from the lower rail, *a*, of the frame A *a* to the lower take-up roll, D', will be bent over the said rail *a* in the manner shown in the above-mentioned figure in red color.

On the top of the frame A *a* there is arranged parallel with the rolls, and in suitable bearings, *h h*, a three-armed rock-shaft, *i*, from one arm, *j*, of which is suspended a long pawl, *k*, which acts upon the ratchet-wheel *f* to produce the take-up movement. Another arm, *l*, is furnished with a roller, *l'*, which works in contact with a stationary cam, E, secured to the standard B, and surrounding the bearing of the journal *b*, the object of such cam being to produce the action of the pawl upon the ratchet-wheel by the rotary motion of the frames A *a* C *c* with the knitting-machine. The third arm, *m*, is connected with the frame A *a* by a spring, *n*, which keeps the roller *l'* in contact with the cam E, and which draws up the pawl after it has been depressed by the cam to act upon the ratchet-wheel *f*. The pawl is connected with the arm *m* by means of a spring, *p*, which draws its point toward the ratchet-wheel. The lower part of the pawl, a little above its point, is made with a shoulder, *q*, to operate in the manner which will be presently explained, in combination with a bent stop-lever, *q*, which works on a fulcrum, *r*, in an angle-plate, F, which is secured to the frame A *a*. Fig. 3 is a top view of this plate and lever. The upper part of the said lever, which is situated on the inner side of the pawl, works over a slot, *s*, provided in the angle-plate F, as shown in Fig. 3, for the pawl to work through, and a light spring, *t*, is applied to the lever *q* to draw it toward the pawl; but this spring must not be strong enough to overcome the effect of the spring *p*.

The operation of taking up the goods is as follows: As the frame A *a* and other parts of the take-up rotate with the knitting-machine the rock-shaft *i* and pawl *k* derive a regular movement from the cam E; but the pawl is inoperative on the ratchet-wheel while the quantity of goods between the bar *a* and the take-up rolls is so small that the frame C is not permitted to move so far in the direction

of the arrow shown in Fig. 2 as to allow the ratchet-wheel *f* to come within reach of the pawl *k*, which cannot follow up the ratchet-wheel farther than permitted by the stop-lever *g*, which is held by the spring *t* against a fixed stop, *u*, secured in the plate *F*. As the knitting proceeds and the quantity between the bar *a* and the take-up rolls increases the springs *g* and levers *I* cause the frame *Cc* to move in the direction of the arrow shown in Fig. 2, and so allow the ratchet-wheel to approach the pawl *k* till the latter is capable of operating upon it, and the take-up rolls are then set in operation to the extent of one or more teeth of the ratchet-wheel. The action of the take-up rolls, by reducing the quantity of goods between the bar *a* and the said rolls, draws the frame back in the opposite direction to the arrow shown in Fig. 2, and in so doing draws the ratchet-wheel to such a position that the pawl becomes inoperative. Just before the ratchet-wheel passes out of contact with the pawl the latter in following up the said wheel comes in contact with the stop-lever *g*, and on its next downward movement produced by the cam *E* the shoulder 4, after passing said lever, slips under it, and is thereby prevented from rising, and in this way it is made inoperative sooner than it would be if the ratchet-wheel had to move directly back till the pawl cleared it. The object of this stop-lever is to prevent the pawl from catching on a tooth of the ratchet-wheel, moving it a short distance, and then slipping off and letting back the take-up rolls. The take-up is secured by the pawl *f'*. The pawl *K* remains locked by the stop-lever *g*, which also holds down the arm *l*, with its roller *l'* in such position that the cam *E* does not operate upon it until by the movement of the frame *Cc* in the direc-

tion of the arrow shown in Fig. 2 the ratchet-wheel is allowed to come in contact with the pawl and push it back clear from the stop-lever *g*, when the operation of the take-up again commences.

In the above operation the tension of the goods is perfectly uniform, being governed by the springs *g*, and although the amount taken up and the openness or closeness of the work may be varied by adjusting the said springs to produce a greater or less tension, the uniformity of the take-up does not depend directly upon the tension, as the take-up rolls commence and cease their operation according as the quantity of goods between the bar *a* and take-up rolls increases or diminishes. The taking of the goods from the machine may be said to be effected by the swinging movement of the frame *Cc* under the influence of the springs *g*, and the take-up rolls merely to collect it and roll it up after it has been so taken up.

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

1. The arrangement of the take-up rolls in a frame, *Cc*, which is arranged to swing within the rotating frame *Aa* under the control of springs *g*, and levers *I* or their equivalents, substantially as and for the purpose herein specified.

2. The pawl *k*, and stop-lever *g*, applied in combination with each other and with the ratchet-wheel *f*, frames *Cc* and *Aa*, and stationary cam *E*, to operate substantially as and for the purpose herein set forth.

SAMUEL WARD.

Witnesses:

CORNELIUS PHILLIPS.
CHAS. McDONALD.