

No. 748,219.

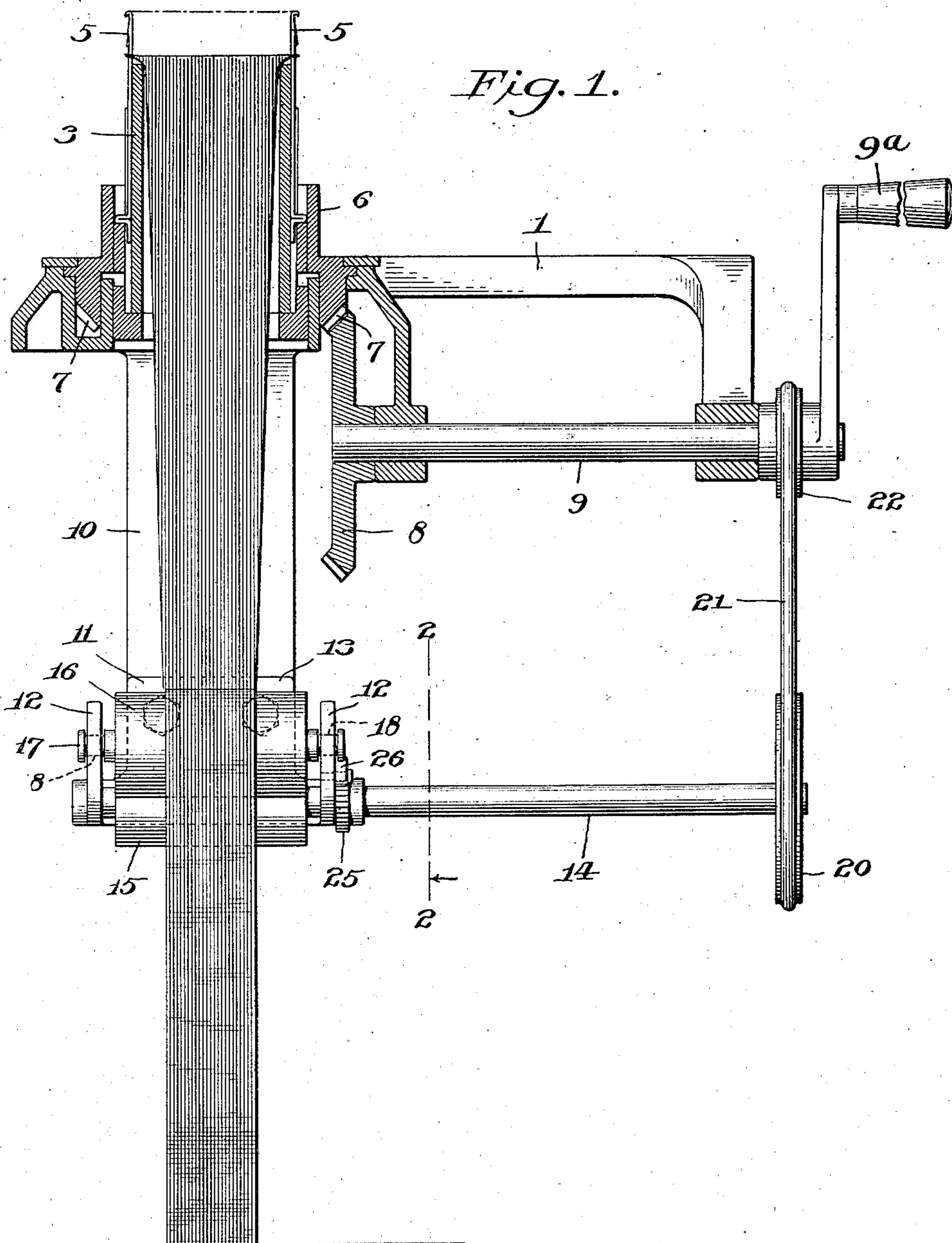
PATENTED DEC. 29, 1903.

C. A. SANTMYERS.
KNITTING MACHINE.

APPLICATION FILED MAY 5, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

H. W. Leamy
H. F. Gamble

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2 SHEETS—SHEET 2.

Fig. 2.

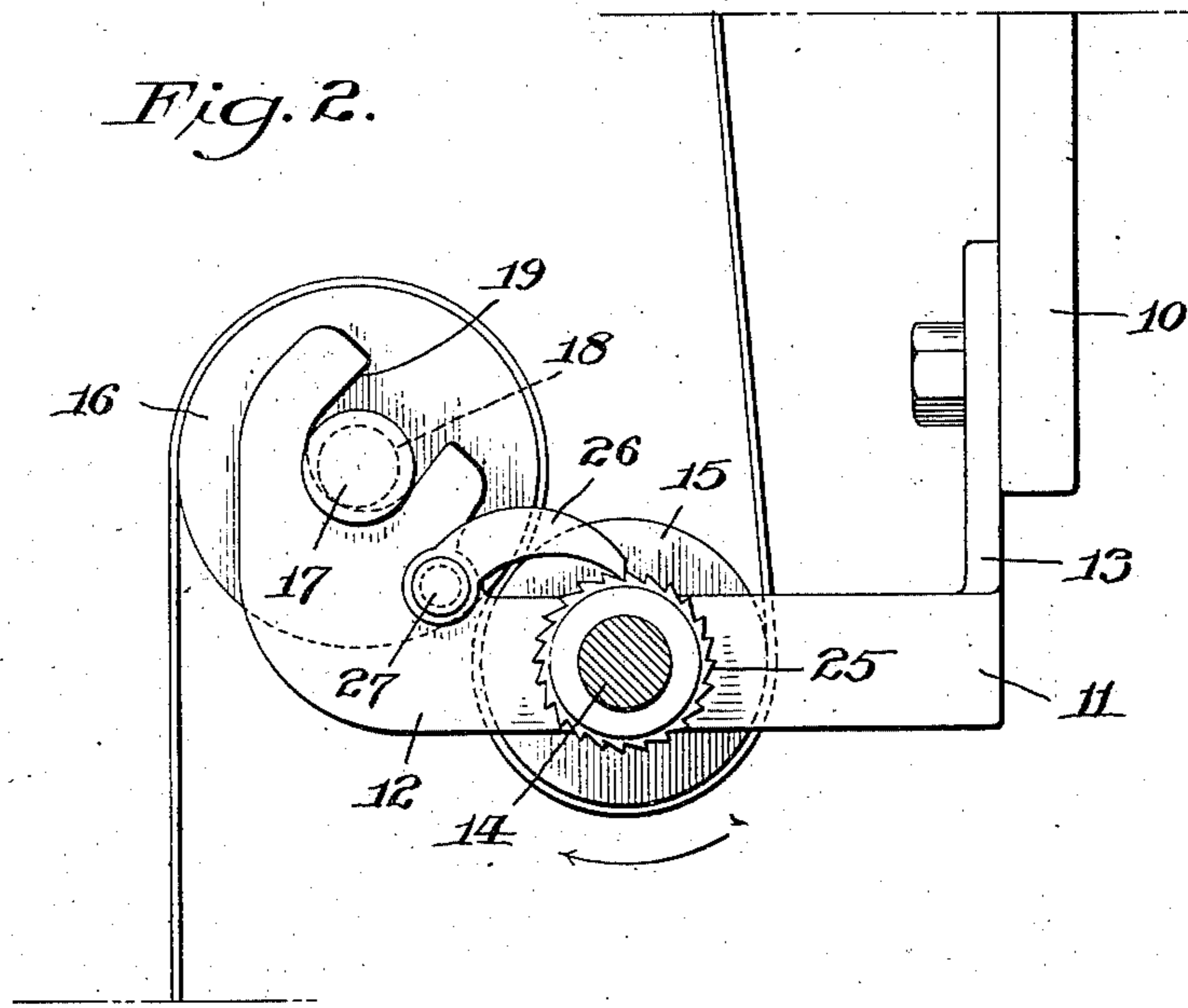
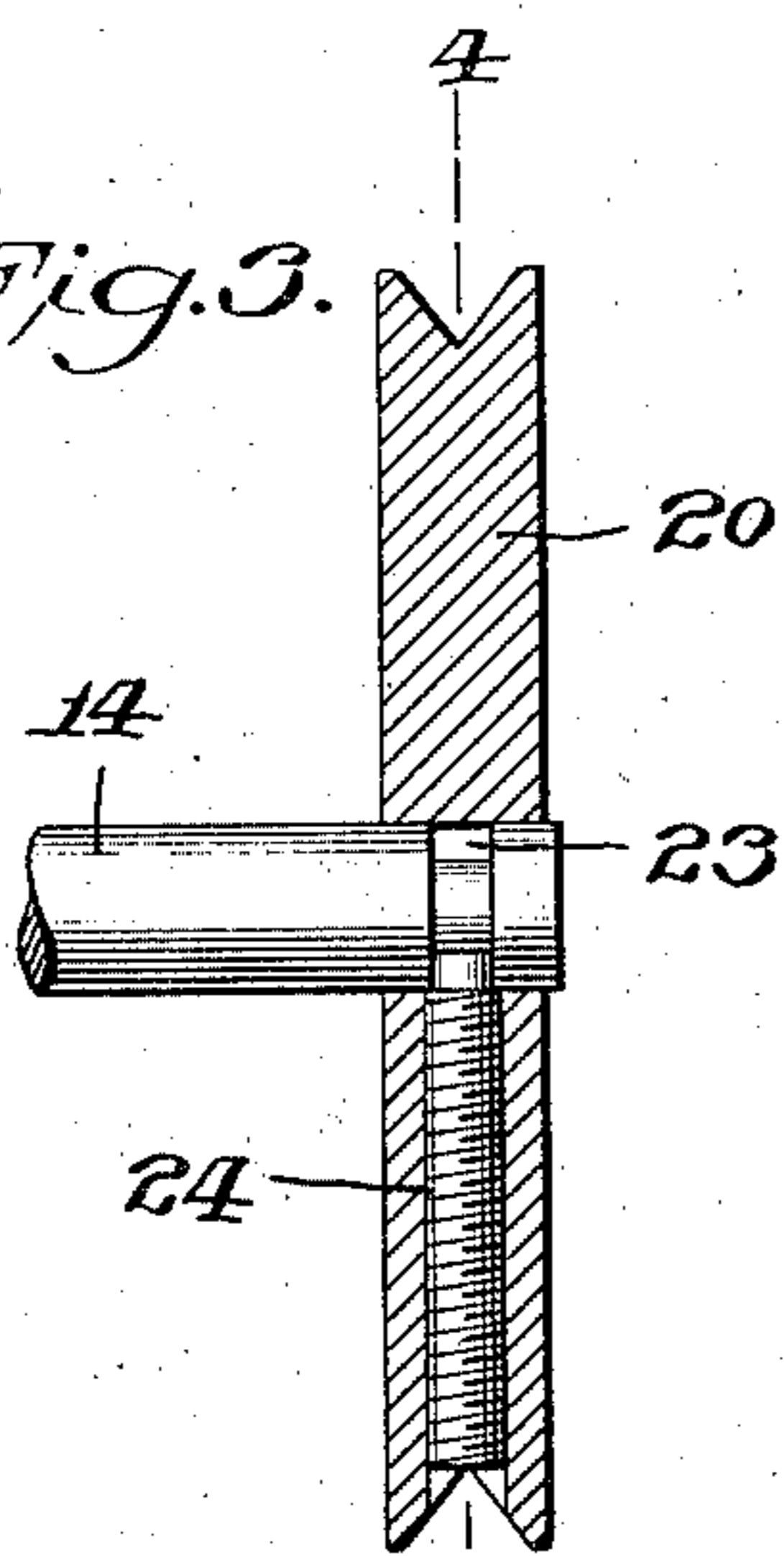


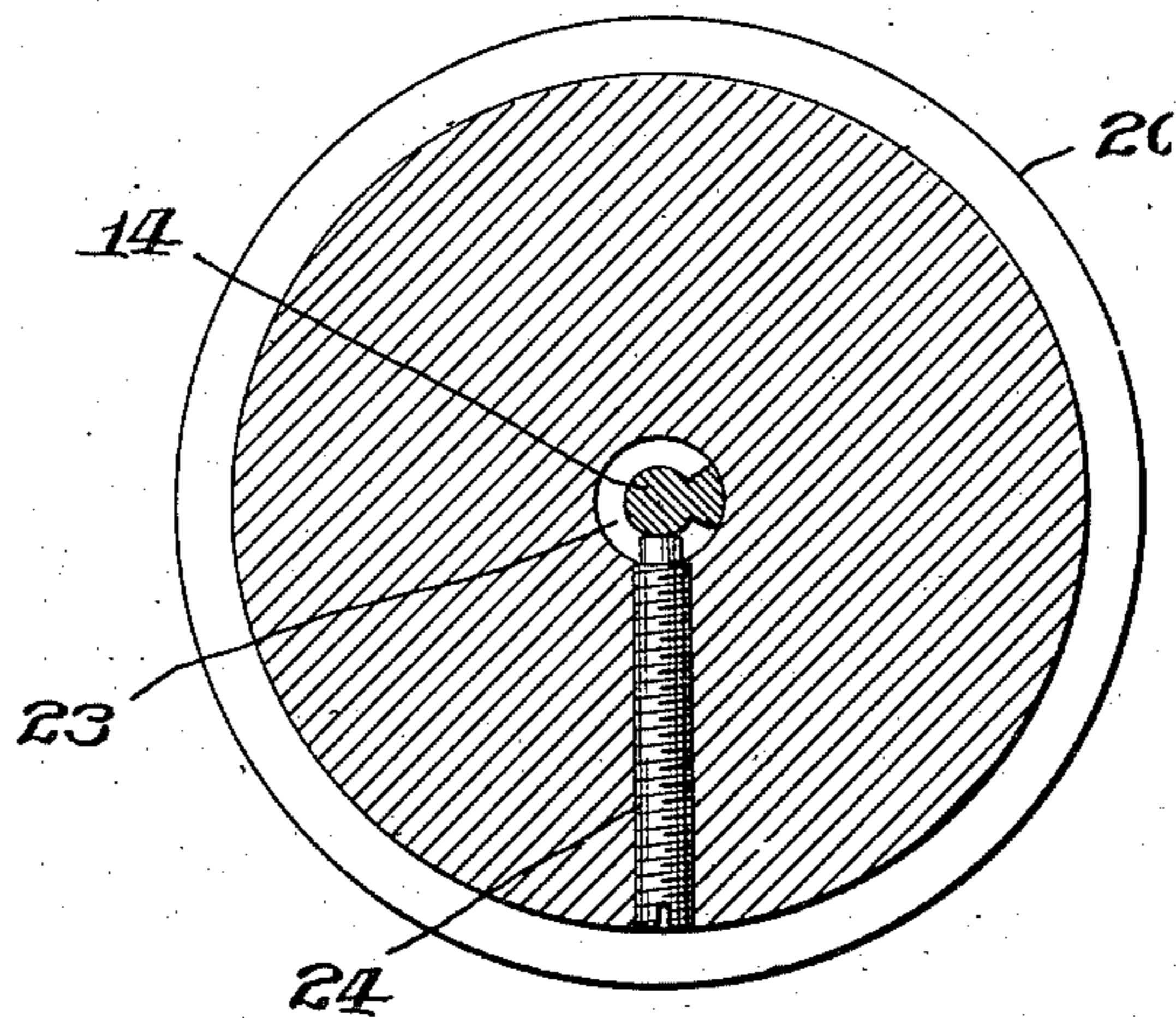
Fig. 3.



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Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES A. SANTMYERS, OF PHILADELPHIA, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 748,219, dated December 29, 1903.

Application filed May 5, 1903. Serial No. 155,705. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. SANTMYERS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification.

This invention relates to knitting-machines, and particularly to that class of knitting-machines employed in the production of stockings.

The object of the invention is to provide a simple and efficient construction and organization of mechanism whereby the knitted fabric as it is delivered from the needles may be removed from the machine under tension.

The invention consists in the novel construction and combinations of parts, which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a sectional elevation of a circular-knitting machine provided with my invention. Fig. 2 is a sectional detail, as on the line 2-2 of Fig. 1. Fig. 3 is a sectional detail of one of the pulleys. Fig. 4 is a similar detail, as on the line 4-4 of Fig. 3.

1 designates the main frame; 3, the needle-cylinder supported thereby; 5, the needles, and 6 the cam-cylinder.

The cam-cylinder 6 is rotatably mounted in the main frame 1 and is provided with teeth 7, which coact with the teeth of the gear-wheel 8, secured to the driving-shaft 9, which is journaled in bearings on the main frame to the end that when the shaft 9 is actuated the cam-cylinder is rotated and the needles are actuated to carry on the knitting operation.

In the present instance I have shown a handle 9^a for imparting the requisite motions to the cam-cylinder. It will be understood, of course, that any well-known means may be employed for this purpose.

After the leg portion of the stocking has been completed the shaft 9, and perforce the cam-cylinder 6, is reciprocated, the needles 5 are thrown into and out of operation in the usual manner, and the heel portion is produced. The shaft 9 is then actuated to rotate the cam-cylinder to produce the foot portion, upon the completion of which the shaft 9 is again reciprocated and the toe portion is produced similarly to the heel portion.

The construction and operation of the machine thus far is of well-known construction and needs no detailed description herein. 55

I shall now proceed to describe my invention, which in its preferred embodiment is of the following construction: Depending from the main frame 1, adjacent to the needle-cylinder 3, is an extension 10, to the lower end of which is secured a bracket 11. This bracket comprises a pair of arms 12, which are connected together by a body portion 13. Extending between the arms 12 and journaled therein is a shaft 14, carrying a roller 15, which is arranged between the arms 12. Resting against this roller 15 is a roller 16. The shaft 17 of the roller 16 is reduced, as at 18, and the reduced portions are rotatably fitted to sockets 19 in the arms 12 to the end that endwise displacement of the roller 16 will be prevented. The width of the sockets 19 is slightly greater than the diameter of the reduced portions 18 of the shaft 17, so as to allow the roller 16 to move toward and from the roller 15, thereby permitting the roller 16 to rest against the roller 15 by gravity. One end of the shaft 14 extends outwardly and is provided with a pulley 20, which is connected by a belt 21 with a pulley 22 on the driving-shaft 9 of the knitting-machine. The pulley 20 is rotatably mounted on the shaft 14 over a groove 23, cut in and extending part way around said shaft, and the pulley 20 is provided with a screw 24, the inner end of which extends freely into the groove 23, to the end that the pulley 20 will freely rotate upon the shaft 14 until the inner end of the screw takes against one end of the slot 23, whereupon the shaft 14 will be rotated with the pulley 20. The shaft 14 has affixed thereto a ratchet-wheel 25, which is engaged by a pawl 26, pivoted, as at 27, to one of the arms 12 of the bracket 11, thereby permitting the shaft 14 to rotate only in the direction indicated by the arrow in Fig. 2. 95

Assuming that the knitted fabric delivered from the needles 5 has been brought down beneath the roller 15, up between the rollers 15 and 16, and over the top of the roller 16, as indicated in the drawings, the operation of the invention is as follows: During the rotation of the shaft 9 to produce the leg and foot portions of the stocking the pulley 22 drives the belt 21, which rotates the pulley 100

20, and the screw in the latter pulley, taking against one end of the slot 23, rotates the shaft 14, and perforce the roller 15, in a manner to draw upon the fabric delivered from the needles 5 until the tension exerted on the fabric overcomes the frictional engagement of the belt 21 with the pulley 20, whereupon the belt 21 slips upon the pulley 20, and as rapidly as the fabric is delivered from the needles and the tension thereby decreased the belt 21 actuates the pulley 20 in a manner to feed the fabric from the machine between the rollers 15 and 16 under a positive and uniform tension. During the production of the heel and toe parts of the stocking the shaft 9 is reciprocated, and the body of the fabric is not fed from the machine, owing to the inaction of one-half of the needles during this operation, as is well known to those skilled in this art. It is therefore necessary to prevent the rotation of the roller 15 and also to maintain the tension upon the fabric. This end is accomplished by the pawl 26 engaging the ratchet-wheel 25 and preventing the backward movement of the shaft 14 and roller 15 and the inner end of the screw 24, working in the slot 23 of the shaft 14, and thereby permitting the belt 21 to reciprocate the pulley 20 with the shaft 9 while the shaft 14 remains idle. Upon the completion of either the heel or the toe portions of the stocking the shaft 9, and perforce the pulleys 20 and 22, are again rotated, the screw 24 takes against one end of the slot 23, the shaft 14 and the rollers 15 are again rotated, and the fabric is again fed from the machine under tension, as previously explained.

It will of course be observed that instead of passing the fabric under the roller 15 and then over the roller 16, as above described, the fabric delivered from the needles may be wrapped one or more times around the roller 15, its free end passing from the roller after the last turn. In this event the roller 16 would be dispensed with and the fabric would be wound upon and delivered from the roller 15 as rapidly as it is delivered from the needles.

I claim—

1. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-cylinder, the knitting-cams carried thereby, and means adapted to be operated to impart a continuous rotary motion and a reciprocating motion to the cam-cylinder to effect the operation of the needles, of mechanism adapted to engage and feed the fabric delivered from the needles, means connected to the first-named means for actuating said mechanism during the continuous rotary motion of the cam-cylinder, and means for rendering said mechanism idle during both the forward and back strokes of the reciprocation of the cam-cylinder.

2. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-cylinder, the knitting-cams carried thereby,

and means adapted to be operated to impart a continuous rotary motion and a reciprocating motion to the cam-cylinder to effect the operation of the needles, of a roller adapted to engage and feed the fabric delivered from the needles, a shaft projecting from the roller, a pulley loosely mounted on said shaft, a belt passing around said pulley, means for continuously driving said belt during the continuous rotary motion of the cam-cylinder and reciprocating said belt during the reciprocation of the cam-cylinder, means for engaging the pulley with said shaft during the continuous rotary motion of the cam-cylinder and disengaging said pulley from said shaft during the reciprocation of the cam-cylinder, and means to prevent the backward movement of said roller.

3. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-cylinder, the knitting-cams carried thereby, and means adapted to be operated to impart a continuous rotary motion and a reciprocating motion to the cam-cylinder to effect the operation of the needles, of a roller adapted to engage and feed the fabric delivered from the needles, a shaft projecting from the roller, a pulley loosely mounted on said shaft, a belt passing around said pulley, means for continuously driving said belt during the continuous rotary motion of the cam-cylinder and reciprocating said belt during the reciprocation of the cam-cylinder, means for engaging the pulley with said shaft during the continuous rotary motion of the cam-cylinder and disengaging said pulley from said shaft during the reciprocation of the cam-cylinder, a ratchet-wheel on said shaft, and a pawl engaged with said ratchet-wheel whereby the backward movement of said roller is prevented.

4. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-cylinder, the knitting-cams carried thereby, and means adapted to be operated to impart a continuous rotary motion and a reciprocating motion to the cam-cylinder to effect the operation of the needles, of a roller adapted to engage and feed the fabric from the needles, a shaft projecting from the roller and having a groove therein extending part way around the shaft, a pulley loosely mounted on said shaft and having a projection entering said groove, a belt passing around said pulley, means for continuously driving said belt during the continuous rotary motion of the cam-cylinder and reciprocating said belt during the reciprocation of the cam-cylinder; whereby as the cam-cylinder is continuously rotated said projection will engage the end of said groove and rotate said roller, and as the cam-cylinder is reciprocated the said projection will reciprocate in said groove and the roller remain idle; and means to prevent the backward movement of the roller.

5. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-

cylinder, the knitting-cams carried thereby, and means adapted to be operated to impart a continuous rotary motion and a reciprocating motion to the cam-cylinder to effect the operation of the needles, of a roller adapted to engage and feed the fabric from the needles, a shaft projecting from the roller and having a groove therein extending part way around the shaft, a pulley loosely mounted on said shaft and having a projection entering said groove, a belt passing around said pulley; means for continuously driving said belt during the continuous rotary motion of the cam-cylinder and reciprocating said belt during the reciprocation of the cam-cylinder, whereby as the cam-cylinder is continuously rotated said projections will engage the end of said groove and rotate said roller, and as the cam-cylinder is reciprocated the said projection will reciprocate in said groove and the roller remain idle; a ratchet-wheel on said shaft, and pawl engaged with said ratchet whereby the backward movement of said roller is prevented.

6. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-cylinder, the knitting-cams carried thereby, the driving-shaft and means carried thereby for actuating the cam-cylinder to effect the operation of the needles, of a roller adapted to engage and feed the fabric delivered from the needles, a shaft projecting from the roller, a pulley loosely mounted on said shaft, a

pulley on said driving-shaft, a belt passing around said pulleys, means for engaging the first-named pulley with the roller-shaft when the driving-shaft is continuously rotated and disengaging the first-named pulley from the roller-shaft when the driving-shaft is reciprocated, and means to prevent the backward movement of said roller.

7. In a knitting-machine, the combination with the needle-cylinder, the needles, the cam-cylinder, the knitting-cams carried thereby, and means adapted to be operated to impart a continuous rotary motion and a reciprocating motion to the cam-cylinder to effect the operation of the needles, of a roller adapted to engage and feed the fabric from the needles, means connected to the first-named means for rotating said roller during the continuous rotary motion of the cam-cylinder, means for rendering said roller idle during the reciprocation of the cam-cylinder, a second roller resting by gravity upon the first-named roller to press the fabric into engagement with the latter, and means for guiding said second roller so as to have a movement toward and from the first-named roller.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. SANTMYERS.

Witnesses:

ANDREW V. GROUPE,
W. W. CANBY.