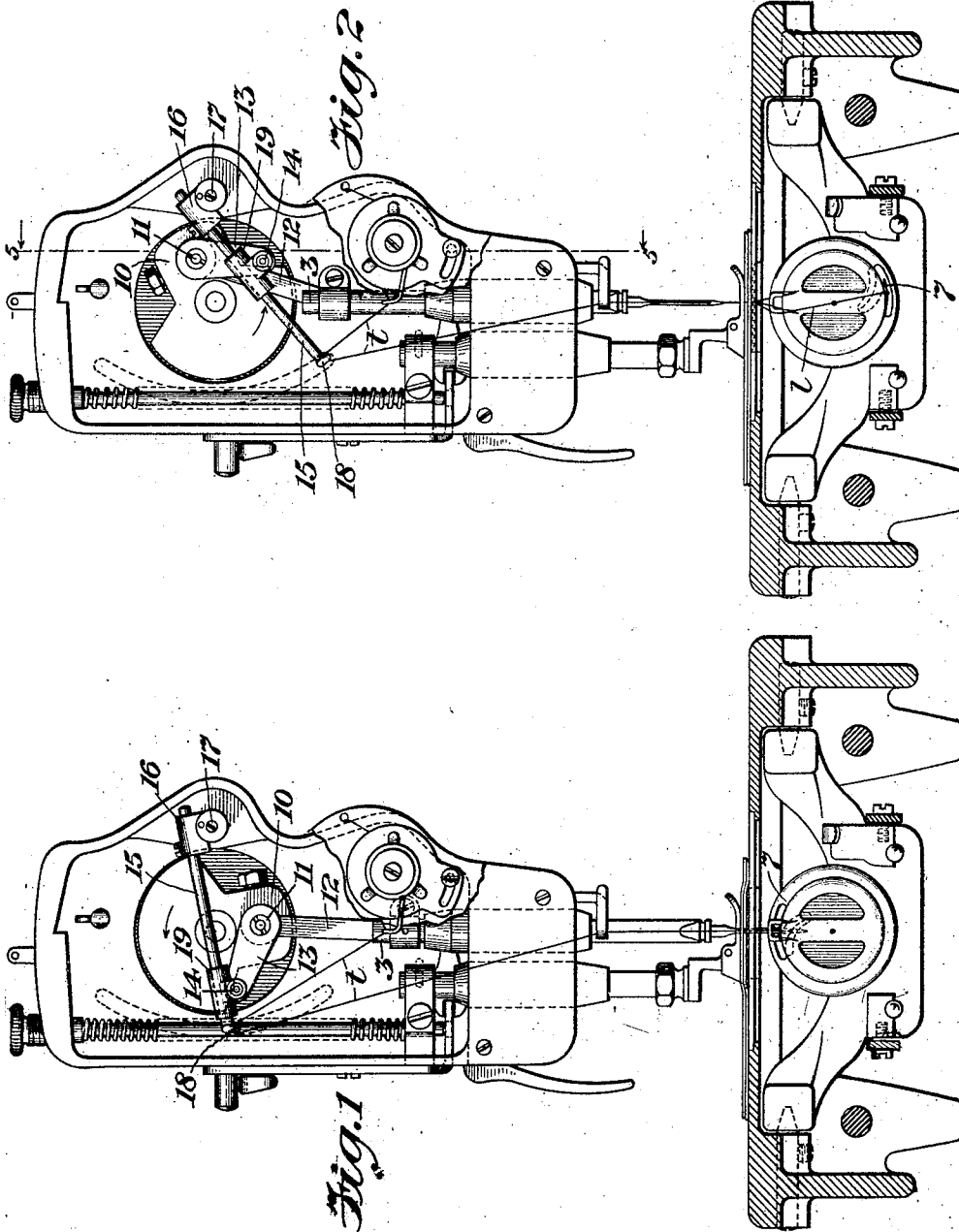


W. A. MACK.
 TAKE-UP MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED MAY 10, 1911.

1,053,841.

Patented Feb. 18, 1913.

3 SHEETS—SHEET 1.



WITNESSES:
Chas. J. Claggett
H. M. Cassidy

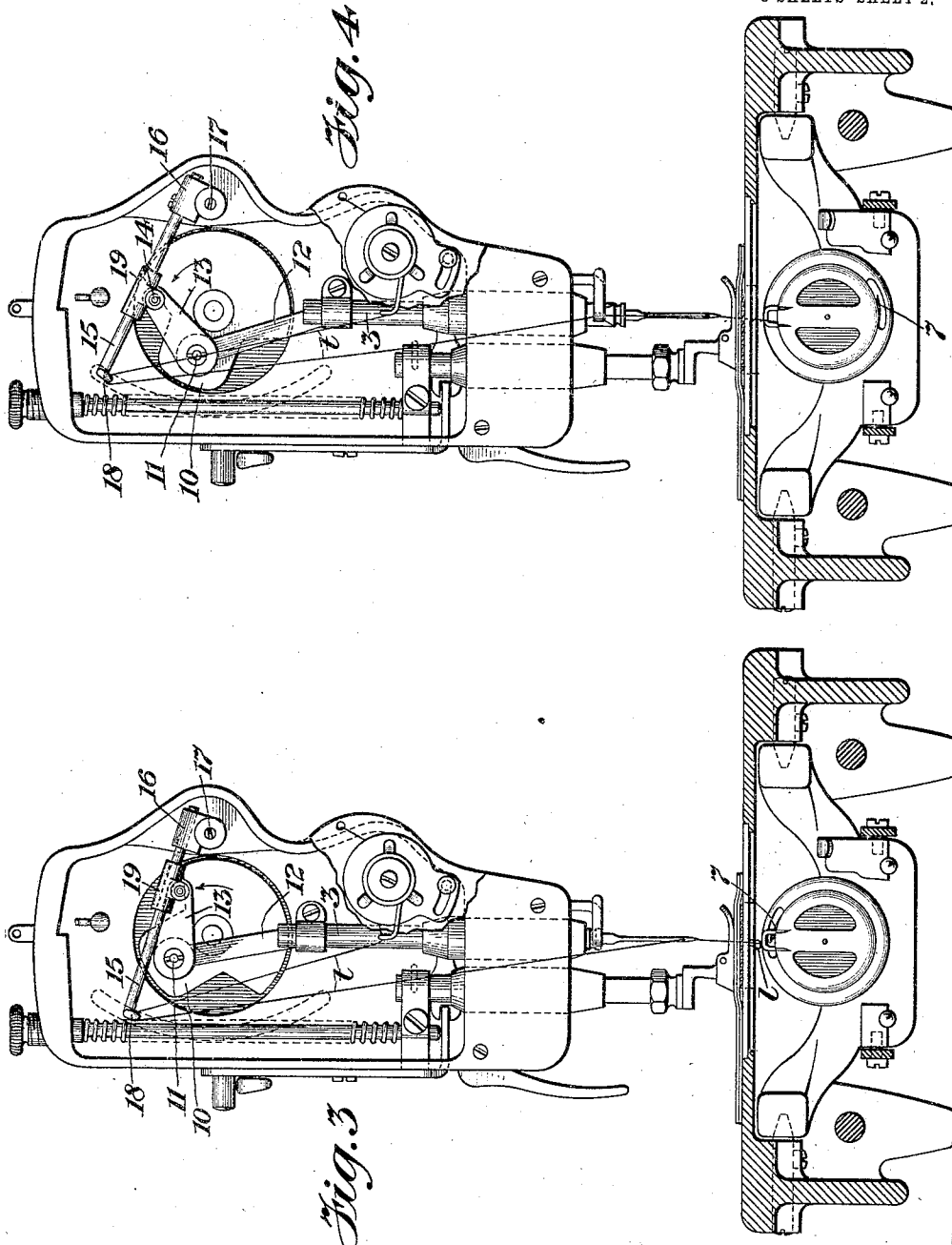
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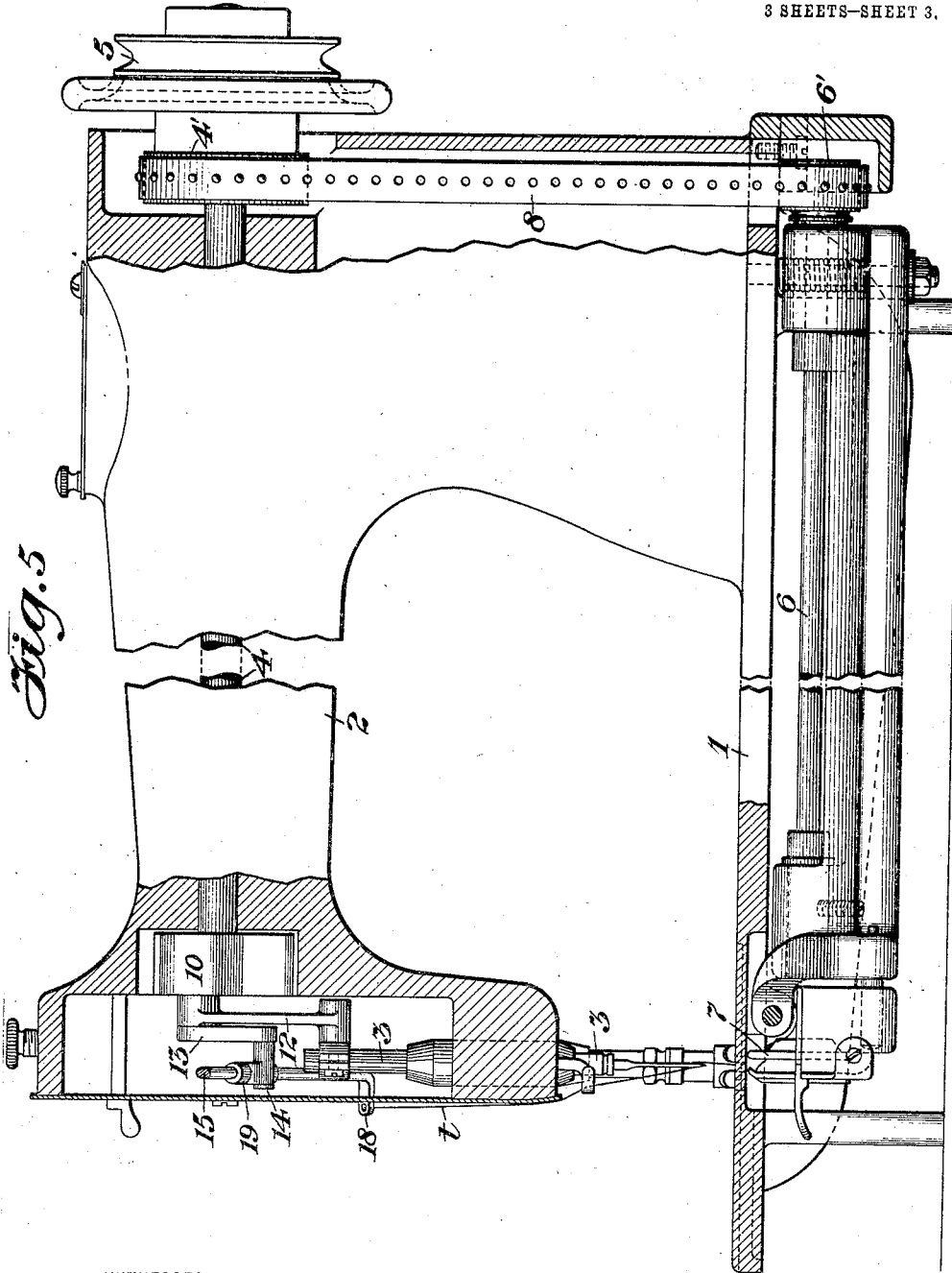
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WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM A. MACK, OF CLEVELAND, OHIO, ASSIGNOR TO THE STANDARD SEWING MACHINE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

TAKE-UP MECHANISM FOR SEWING-MACHINES.

1,053,841.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed May 10, 1911. Serial No. 626,185.

To all whom it may concern:

Be it known that I, WILLIAM A. MACK, citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Take-Up Mechanism for Sewing-Machines, of which the following is a specification.

My invention has for its object to provide an improved take-up mechanism for use in high-speed sewing machines of the type employing a rotary loop-taker which has a plurality of revolutions to each reciprocation of the needle. When a machine of this type is operated at a very high rate of speed, say at a speed sufficient to produce about four thousand stitches and upward per minute as does the machine embodying my invention and as a consequence of which the loop-taker is operated to have double that number of revolutions, it is obviously necessary that the thread be positively controlled in its relation to the cooperating stitch-forming devices and particularly in its relation to the loop-taker in order that perfect stitching may be made. Heretofore in this type of machine, on account of the excessive speed of the loop-taker in making its plurality of revolutions to each reciprocation of the needle, the needle thread loop after being cast off by the loop-taker has not been drawn by the take-up above the path of movement of said loop-taker prior to the completion of its first or loop-taking revolution, and in order to prevent the thread loop being caught by the loop-taker at the commencement of its second or idle revolution, guards of different kinds have been provided to prevent such engagement by deflecting the loop from the path of movement of the loop-taker at such time. In accordance with my invention, however, the take-up is operated to draw the thread loop above the path of movement of the loop-taker prior to the latter reaching loop-taking position following its cast-off of the loop, or in other words, prior to the loop-taker completing its first or loop-engaging revolution, whereby the necessity for the use of guards, etc., as referred to, is avoided. This and other features of my invention not hereinbefore referred to will be hereinafter particularly described in connection with

the accompanying drawings forming part of this specification, in which—

Figures 1, 2, 3, and 4 are front end elevations of a sewing machine embodying my invention, with the face-plate removed and the bed-plate in section, showing the relative positions of the take-up and loop-taker and their cooperating parts at different times during the operation of the machine, and Fig. 5 is a sectional front side elevation of the machine, with the front end of the arm at the rear of the face-plate in section on line 5—5 of Fig. 2 to show the relative positions of the take-up and its actuating means, and with the rear end of the arm broken away to show the connections between the upper driving shaft and the lower loop-taker shaft.

Similar reference characters designate like parts in the several figures of the drawings.

The sewing machine here shown to which my invention is applied is substantially the same as that made the subject-matter of my pending application, Serial No. 557,339, and it comprises a frame formed by the usual bed-plate 1 and overhanging bracket-arm 2, a vertically reciprocating needle-bar 3 mounted in the front end of said bracket-arm, a horizontally arranged driving shaft 4 mounted in bearings in the upper part of said bracket-arm and having operative connection at its front end with the needle-bar and at its rear end having a drive pulley 5, a loop-taker shaft 6 at the under side of the bed-plate having attached thereto at its front end a loop-taker 7, and a drive belt 8 operatively connecting the shafts 4 and 6 by engagement with sprocket wheels 4' and 6' thereon, the said wheels being so proportioned as to cause two rotations of the lower shaft 6 to each rotation of the upper shaft 4 and thereby two revolutions of the loop-taker, operated by said lower shaft, to each complete reciprocation of the needle-bar, operated by said upper shaft.

The driving shaft 4 is provided at its front end with a crank 10 having a rigidly attached crank-pin 11 which connects with the needle-bar 3 to impart reciprocating movement thereto through the medium of the usual pitman 12. Rigidly connected to the front end of said crank-pin 11 is an

arm 13 which extends rearwardly therefrom in the direction of movement of the crank and is provided at its rear end with a crank-pin 14 for operative connection with the take-up in a manner to be presently described. This crank-pin 14 is located a distance of about ninety degrees in the arc of a circle about the axis of the crank 10 from the crank-pin 11, and by reason of its rigid connection with the crank 10, is of course moved by and with the latter.

The take-up lever, indicated at 15, is arranged to move in a plane parallel with the face of the crank 10 and is here shown in the form of a straight rod fixedly connected at one end with a sleeve 16 pivoted to the frame of the machine at 17, and at its opposite end being provided with a forwardly projecting arm or extension 18 having an eye therein for receiving the needle-thread at a point forward of the face plate as shown. Between its said ends the take-up lever is engaged by a sleeve 19 which has a slidable connection therewith and is pivotally connected with the crank-pin 14 to be supported and moved thereby.

By means of the construction, arrangement and organization of the take-up and associated parts as described and shown, which includes the location of the take-up fulcrum 17 in a position at one side of the axis of the crank 10 and in substantially the same horizontal plane therewith and also the engagement of the take-up lever with its supporting sleeves 16 and 19 at one side of their axis of movement, the take-up is caused to positively and accurately control the thread when the machine is being operated at the high speed hereinbefore referred to, in substantially the manner shown in Figs. 1 to 4 inclusive of the drawings, in which Fig. 1 shows the relative positions of the take-up, needle and loop-taker and the control of the needle-thread by said take-up at the time the point of the loop-taker is entering or taking the thread-loop from the needle; Fig. 2, the relative positions of the same parts when the thread loop *l* is about to be cast off by the loop-taker and drawn up by the take-up; Fig. 3, the relative positions of the same parts at the time the loop-taker has completed its first revolution following its cast off of the thread-loop, and showing the latter drawn well above the path of movement of the loop-taker point so as to avoid possibility of its being engaged thereby; and Fig. 4 the relative positions of the parts with the take-up at the limit of its up-stroke and in stitch-tightening position.

It will be observed that the actuating crank sleeve 19 slides back and forth on the take-up lever substantially from end to end thereof, whereby the required differential or fast and slow movement is imparted to

the take-up for its proper handling of the thread, that is, a slow downward movement of the take-up in giving down the thread required by the loop-taker in passing or extending the thread-loop about the bobbin-case, and a subsequent quick upward movement of the take-up to draw the thread-loop, as particularly required in the present case, above the path of movement of the loop-taker prior to the latter beginning its second or idle revolution. In so operating the take-up, the organization of its actuating mechanism is such that its speed of movement is lessened as it approaches the limit of its up-stroke in tightening and setting the stitch, at which time the thread is under greatest strain, in order to avoid any sudden jerk on the thread such as might tend to break the same.

What I claim is:—

1. In a sewing machine, the combination with a reciprocating needle, a rotary loop-taker operative in a vertical plane, and means for giving said loop-taker a plurality of revolutions to each reciprocation of the needle, of a take-up, and means for operating said take-up to increase the speed thereof after the cast-off of the thread-loop by the loop-taker to draw said loop above the path of movement of the loop-taker prior to the latter reaching loop-taking position at the completion of the first of its said plurality of revolutions.

2. In a sewing machine, the combination with a reciprocating needle, a rotary loop-taker operative in a vertical plane, and means for giving said loop-taker a plurality of revolutions to each reciprocation of the needle, of a vibrating take-up, and means for operating said take-up to increase its speed after the cast-off of the thread loop by the loop-taker to draw said loop above the path of movement of the loop-taker prior to the latter reaching loop-taking position at the completion of the first of its said plurality of revolutions.

3. In a sewing machine, the combination with a reciprocating needle-bar and its needle, a revoluble crank operatively connected with said needle-bar to actuate the same, a rotary loop-taker operative in a vertical plane, and means for giving said loop-taker a plurality of revolutions to each reciprocation of the needle, of a pivoted take-up, and connections between the revoluble crank and said take-up for operating the latter to increase its speed after the cast-off of the thread loop by the loop-taker to draw said loop above the path of movement of the loop-taker prior to the latter reaching loop-taking position at the completion of the first of its said plurality of revolutions.

4. In a sewing machine and in combination, a reciprocating needle-bar and its needle, a revoluble crank carrying two crank-

pins one of which is operatively connected with said needle-bar to actuate the same, a rotary loop-taker operative in a vertical plane, means for giving said loop-taker a plurality of revolutions to each reciprocation of the needle, two sleeves, one being pivoted to the second crank-pin of the revoluble crank to be moved therewith and the other being pivoted to a stationary support at one side of the axis of said crank and in substantially the same horizontal plane therewith, and a take-up lever supported by said sleeves and having a fixed connection with one and a slidable connection with the other; said parts being constructed, arranged, and organized whereby the take-up will operate after the cast-off of the thread loop by the loop-taker to draw said loop above the path of movement of the loop-taker prior to the latter reaching loop-taking position at the completion of the first of its said plurality of revolutions.

5. In a sewing machine and in combination, a reciprocating needle-bar and its needle, a revoluble crank carrying two crank-pins one of which is located in advance of the other in their direction of rotation and is operatively connected with the needle-bar to actuate the same, a rotary loop-taker operative in a vertical plane, means for giving said loop-taker a plurality of revolutions

to each reciprocation of the needle, two sleeves, one being pivoted to the second or rearwardly located crank-pin of the revoluble crank to be moved therewith and the other being pivoted to a stationary support at one side of the axis of said crank and in substantially the same horizontal plane therewith, and a straight take-up lever supported by said sleeves at one side of their axis of movement and having a fixed connection at one end with one and a slidable connection between its ends with the other; said parts being constructed, arranged and organized whereby the crank-supported sleeve will be caused to slide from end to end of the take-up lever and operate the latter to control the thread with respect to the cooperating stitch-forming devices, and in so doing, operate after the cast-off of the thread loop by the loop-taker to draw said loop above the path of movement of the loop-taker prior to the latter reaching loop-taking position at the completion of the first of its said plurality of revolutions.

Signed at Cleveland, in the county of Cuyahoga and State of Ohio, this 1st day of May A. D. 1911.

WILLIAM A. MACK.

Witnesses:

CHAS. C. EMMONS,
S. K. BRINEY.