

No. 724,576.

PATENTED APR. 7, 1903.

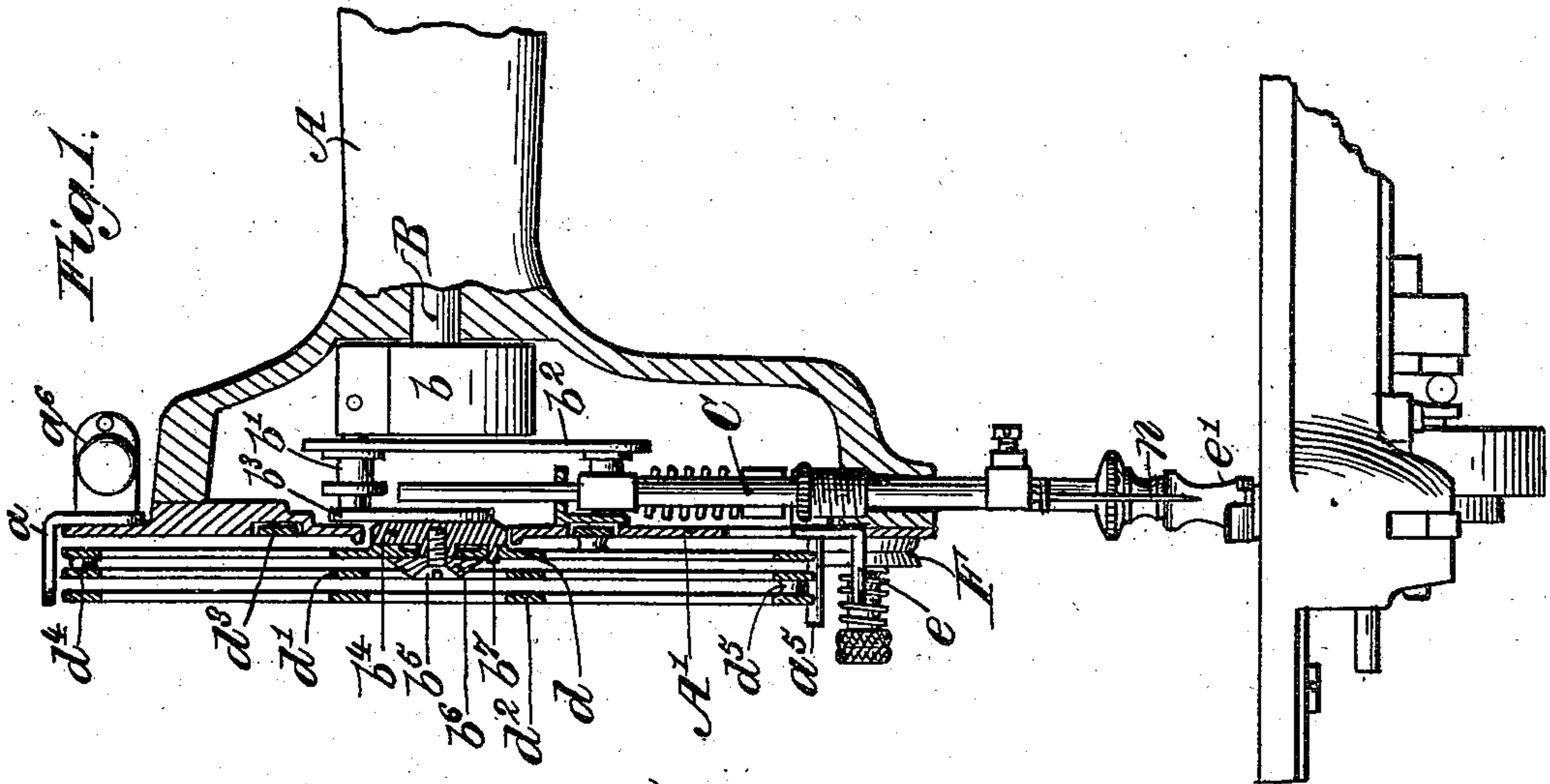
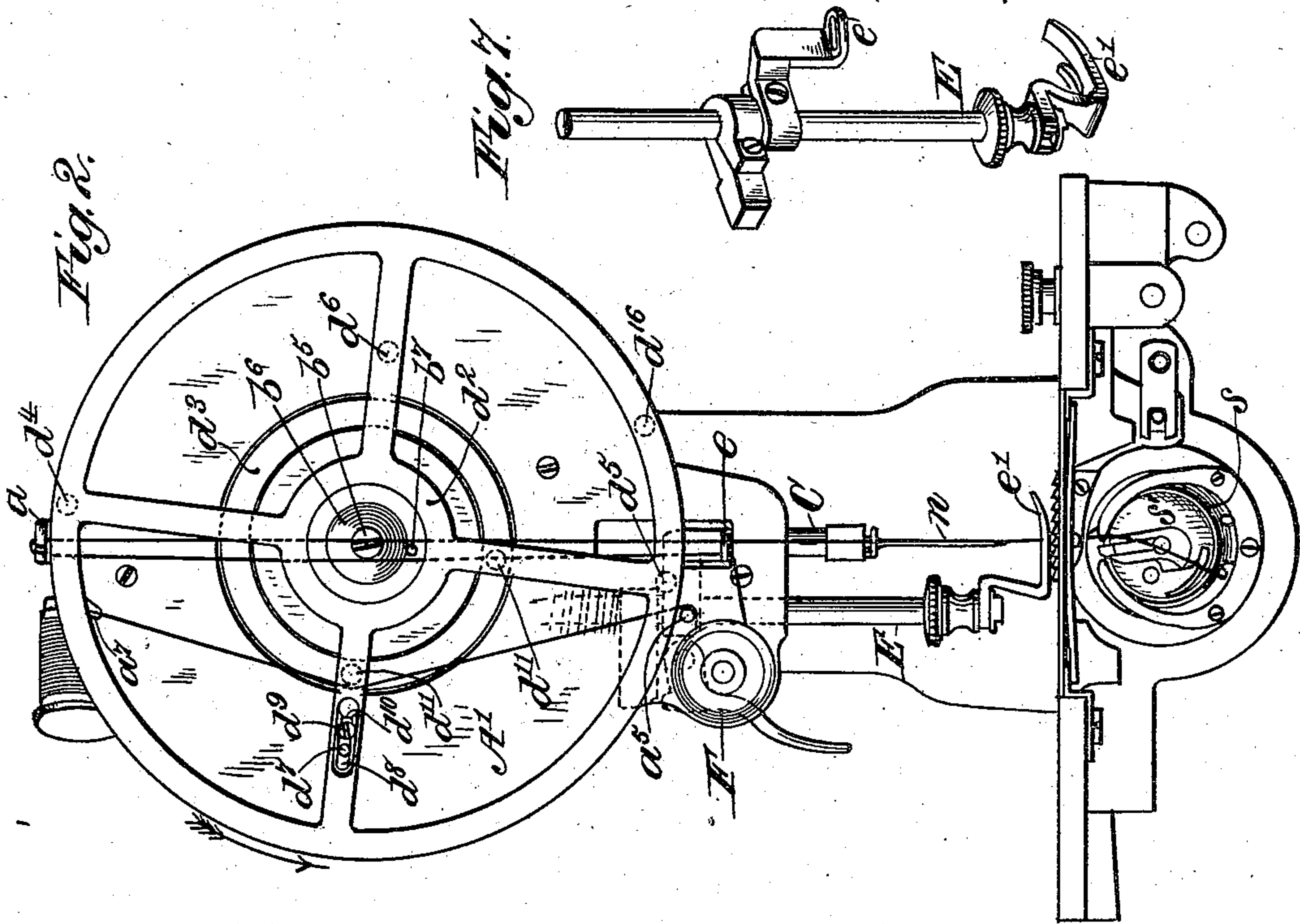
J. HEBERLING.

ROTARY TAKE-UP FOR SEWING MACHINES.

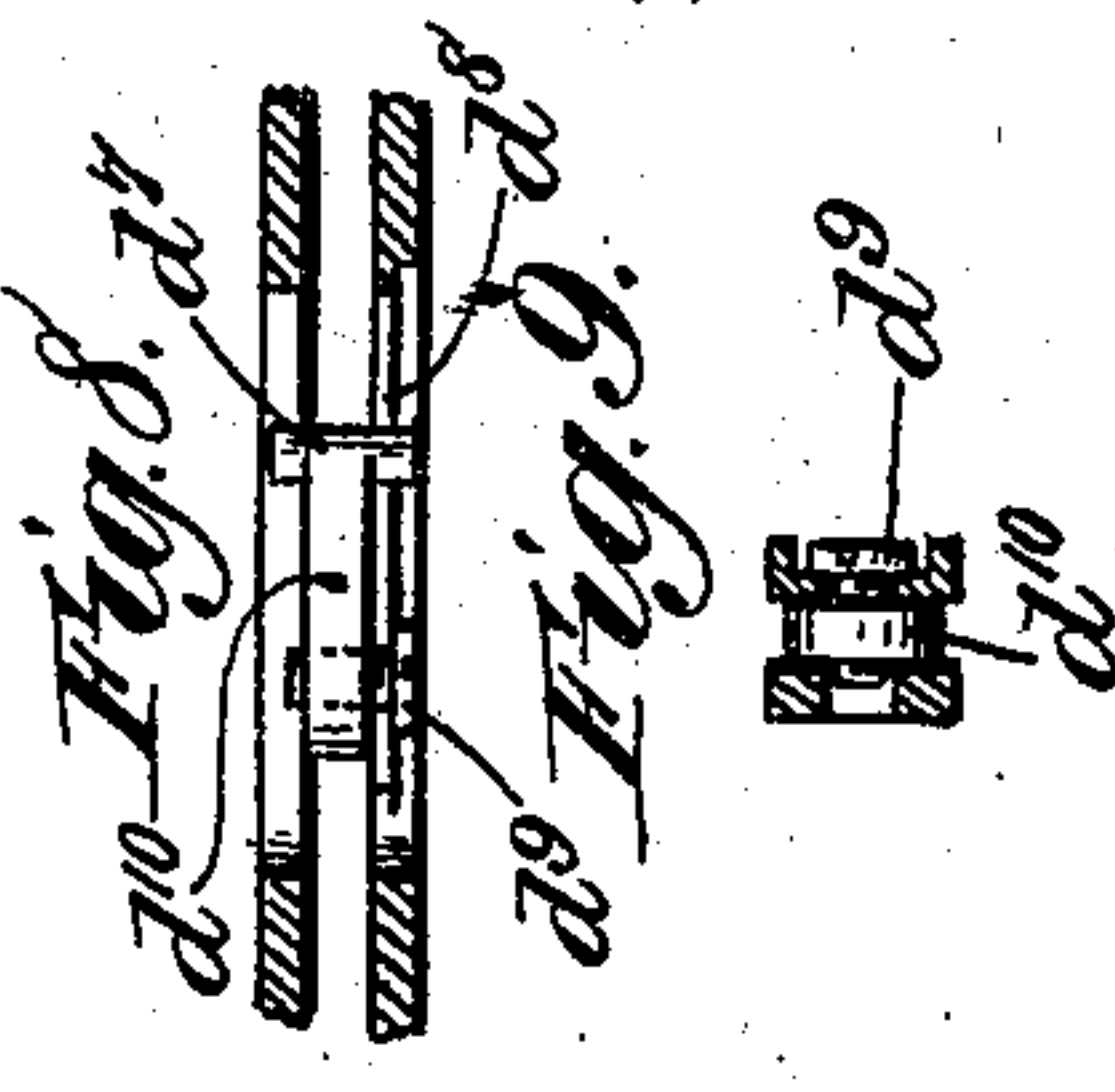
APPLICATION FILED MAY 27, 1902

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
Robert Court,
Arthur W. Calvert.



Inventor:
J. Heberling
By *Henry Calvert*
Atty.

No. 724,576.

PATENTED APR. 7, 1903.

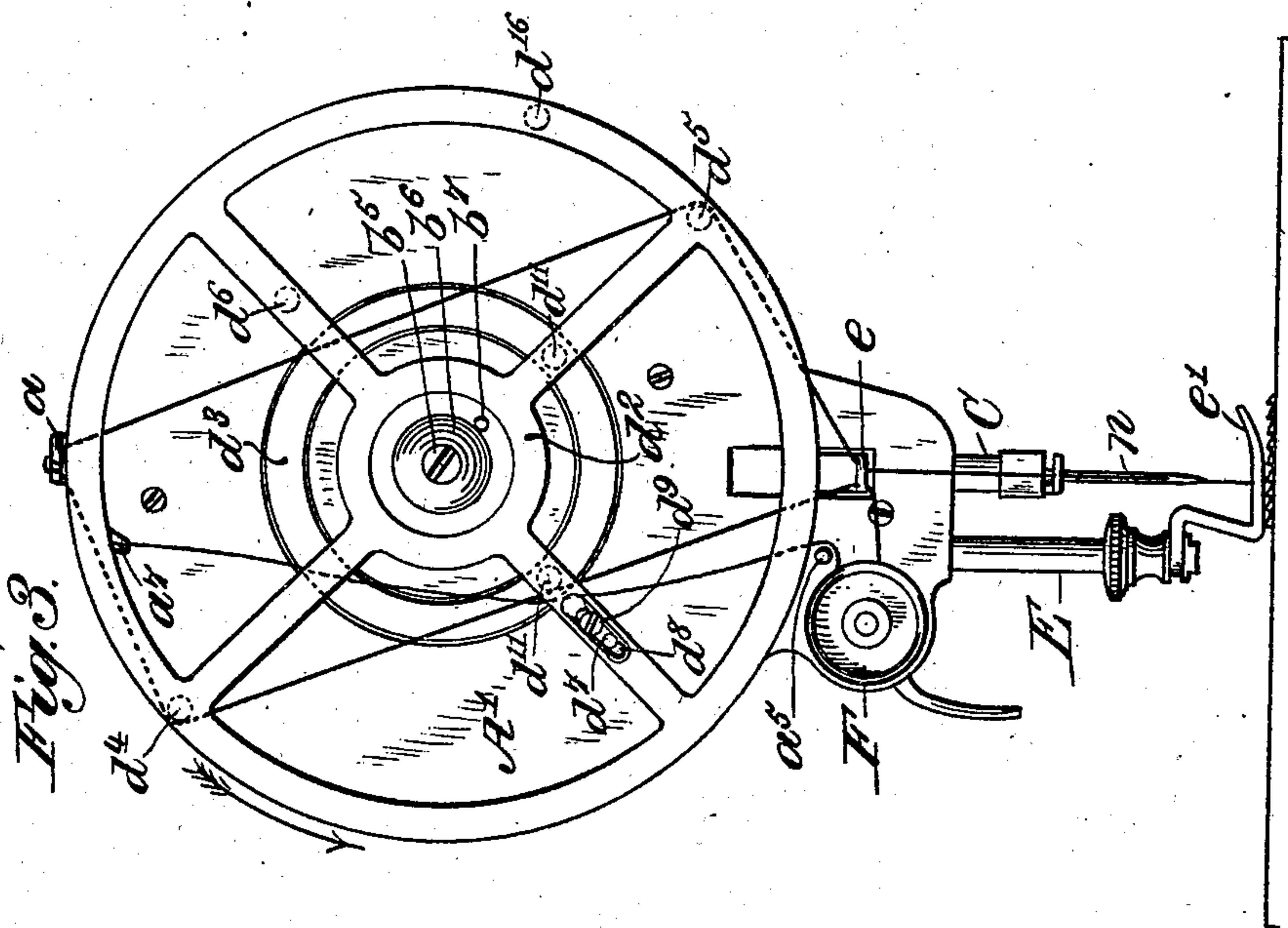
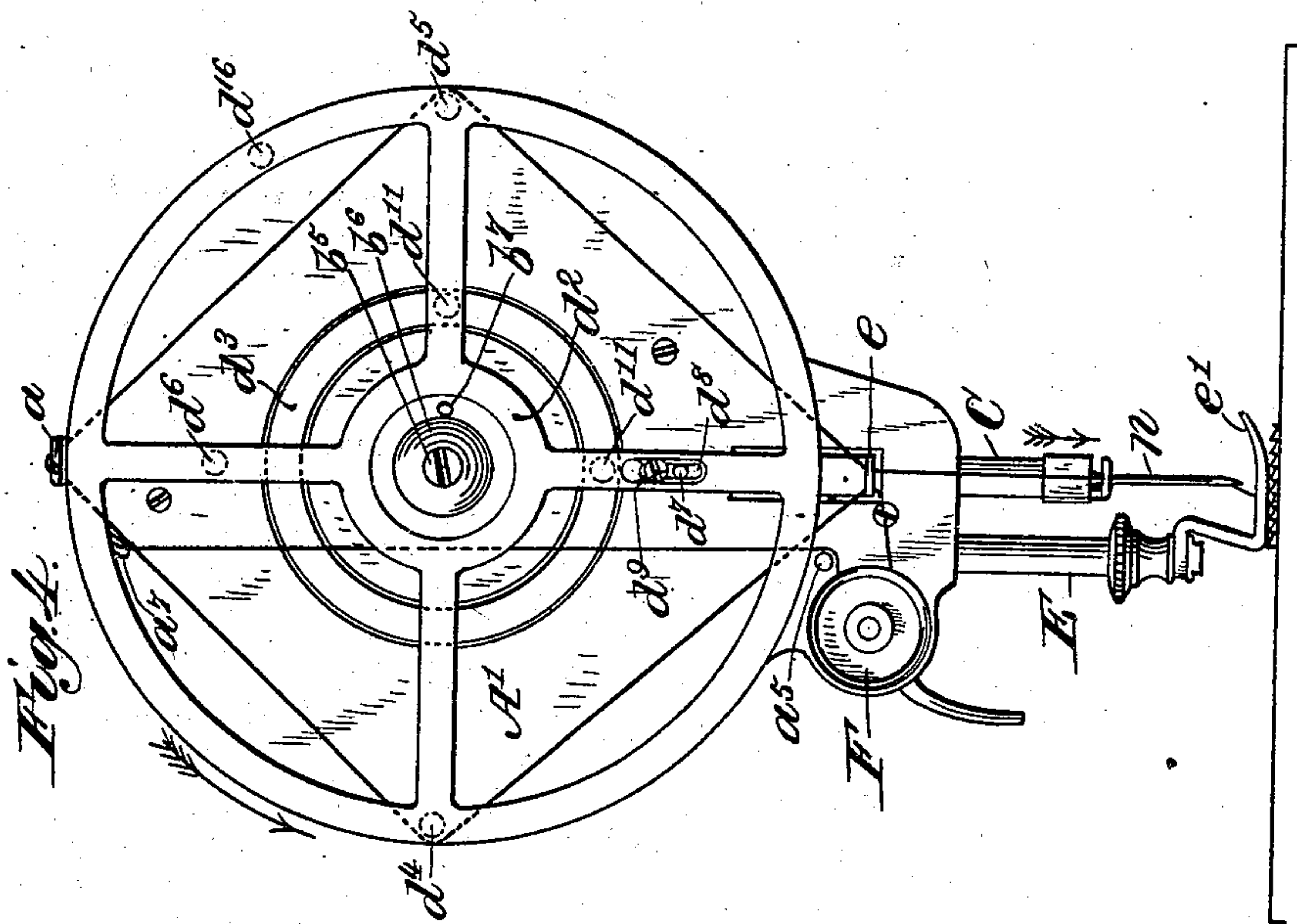
J. HEBERLING.

ROTARY TAKE-UP FOR SEWING MACHINES.

APPLICATION FILED MAY 27, 1902.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses:
Robert Emmett,
Arthur W. Calvert.

Inveptor:
John Seberling
By Henry Calver,
Atty.

UNITED STATES PATENT OFFICE.

JOHN HEBERLING, OF ROCHESTER, NEW YORK.

ROTARY TAKE-UP FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 724,576, dated April 7, 1903.

Application filed May 27, 1902. Serial No. 109,201. (No model.)

To all whom it may concern:

Be it known that I, JOHN HEBERLING, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Rotary Take-Ups for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to a rotary take-up for sewing-machines, which is of such construction as to tighten the stitch quickly with the least possible strain upon the needle-thread, so as to leave plenty of time in the
15 rotation of the driving-shaft for the operation of the other parts of the sewing mechanism and so that the danger of breaking the needle-thread when the machine is running at high speeds will be reduced to a minimum,
20 the improved take-up being of such construction and being so timed relative to the movements of the needle and shuttle as properly to control the needle-thread at all times, so that during no part of the stitch-forming operations will there be an objectionable amount
25 of slack needle-thread.

To this end the improved take-up comprises a rotating wheel or device so connected with the driving-shaft as to perform a single rotation to each rotation of said shaft and preferably at a uniform speed, said rotating wheel or device comprising three or more connected disks, preferably of skeleton form and separated from each other in such a manner as to
30 provide two or more distinct thread-passages, and the said rotating wheel or device also comprising two or more eccentric oppositely-acting take-up pins or studs, so that in tightening the stitches two or more bights of needle-thread will be simultaneously formed,
40 thereby taking up slack quickly with less strain upon the thread than would result in taking up an equal amount of slack thread in an equal time by forming a single slack-tightening bight of thread. The said rotary take-up also preferably comprises two or more eccentric slack-controlling pins or studs so disposed as to let off the slack needle-thread
45 slowly as it is required by the shuttle, and said rotary take-up also preferably comprises an eccentric pull-off pin or stud to draw a

suitable amount of thread from the thread-supply at each stitch.

In the accompanying drawings, Figure 1 is a front side sectional view of the head or forward part of the arm of a sewing-machine embodying the invention. Fig. 2 is a front end view of the machine with the parts in the position which they occupy at the moment when a loop of needle-thread has been carried by the shuttle to cast-off position and the take-up or stitch-tightening operation is about to commence. Figs. 3, 4, and 5 are front end views of the head of the machine and showing the parts in different positions from each other and from those represented in Fig. 2 to illustrate the take-up or stitch-tightening and thread-slackening operations. Fig. 6 is a plan view of the head or forward part of the arm of the machine shown in the other views. Fig. 7 is a detail perspective view to show the connection of the lower thread-guide with the presser-bar. Figs. 8 and 9 are enlarged detail views illustrative of the adjustable controlling-pin.

Referring to the drawings, A denotes the forward part of the arm of a well-known type of sewing-machine, and B the rotary driving-shaft, journaled in the upper part of said arm and provided at its forward end with a crank-arm or disk *b*, provided with a crank-pin *b'*, connected by a pitman *b²* with the needle-bar C to reciprocate the said bar in the usual manner. Connected with the crank-pin *b'* is an arm *b³*, carrying a rotary disk *b⁴*, which is concentric with the driving-shaft B. Suitably attached to the disk *b⁴*, as by a screw *b⁵*, a clamping-washer *b⁶*, and a dowel-pin *b⁷*, carried by said disk *b⁴*, is a disk *d*, preferably cut out or made in skeleton form for lightness, but having a central hub or part by which it is clamped or otherwise suitably attached to the said disk *b⁴*, said skeleton disk *d* having radial arms and an encircling rim. Attached to the disk *d* at suitable points is a second skeleton disk *d'*, and attached to the said disk *d'* is a third skeleton disk *d²*, these several disks also having radial arms and encircling rims, said disks being attached together at suitable points in such a manner as to be separated from each other, thereby forming two distinct thread-passages, and the

innermost disk d being separated from the face-plate A' in such a manner as to leave a thread-passage between the said innermost disk and the outer surface of said face-plate.

5 Attached to the innermost disk d and disposed in a recess in the face-plate A' is a ring d^3 , which is separated from the said innermost disk, so as to leave a thread-passage between said disk and said ring. Between the
10 disks d and d' is a take-up pin or stud d^4 , and between the disks d' and d^2 is a second take-up pin or stud d^5 , preferably arranged diametrically opposite to the said take-up pin or stud d^4 so as to act in oppo-
15 sition thereto. Also between the said disks d and d' are two thread-controlling pins or studs d^6 and d^{16} , and between the said disks d' and d^2 is a third thread-controlling pin or stud d^7 , preferably made radially ad-
20 justable on an arm of the skeleton disk d^2 by means of a slot d^8 in said arm and a set-screw d^9 , by which a small plate d^{10} , carrying said pin or stud d^7 , may be secured in different positions of adjustment. The thread-con-
25 trolling pin or stud d^6 may likewise be adjustably mounted on the rotary take-up wheel or device, if desired. Between the innermost take-up disk d and the ring d^3 are one or more eccentric pull-off studs or pins
30 d^{11} , two being employed in the present construction.

Attached to the face-plate A' and overhanging the rotary take-up wheel is a thread-guide a , having two thread-eyes a' and a^2 , register-
35 ing, respectively, with the thread-passages between the separated skeleton disks d and d' and d' and d^2 and having a bridge portion a^3 between said thread-eyes overhanging the central disk d' , said bridge portion serving to prevent the thread from coming in contact with
40 the disks when it is taut, so that it is handled with the least possible friction and wear. Beneath the rotary take-up wheel and preferably diametrically opposite the thread-guide a is
45 a second thread-guide e , preferably having a single thread slot or aperture, said thread-guide e being preferably connected with the presser-bar E , so as to rise and fall with the varying thicknesses of fabric passing beneath
50 the presser-foot e' . The thread-guide e is also preferably so arranged as to keep the thread when taut from contact with the sides of the disks. By connecting the thread-guide e with
55 the presser-bar an automatic regulation of the amount of slack thread drawn up by the take-up is provided for. Thus when thicker work is passing beneath the presser-foot and
60 the thread-guide e is lifted nearer to the take-up wheel more thread will be tightened and slackened, as required by the thicker work, and less thread will be handled when the work is thinner and the presser-foot falls.

The needle-thread runs from the spool or other source of thread-supply through a
65 thread-guide or check tension device a^6 , attached to the face-plate A' , thence through the thread-eye a^7 , near the top of said face-

plate, thence between said face-plate and the innermost disk d and in front of the ring d^3 , recessed in said face-plate, and thence to a
70 guide-pin a^5 on said face-plate, through the tension device F , thence through the guide eye or slot formed in the thread-guide e , and thence upward between the disks d and d' to
75 the thread-eye a' at the top of the rotary take-up device or wheel, thence over the bridge portion a^3 of the thread-guide a to and down-
ward through the thread-eye a^2 and between the disks d' and d^2 to the thread-guide e , and
80 thence to the needle n .

The operation of the improved take-up is as follows: When the shuttle s has carried a loop of needle-thread around the bobbin-case s' to the cast-off position shown in Fig. 2, the
85 needle-thread has been fully slackened for the purpose of permitting of the formation of a loop of needle-thread of the size required by the shuttle. At this time the take-up pins or studs d^4 and d^5 are adjacent to the thread-
90 guides a and e ; but as the take-up rotates in the direction denoted by the arrow in Fig. 2 and the said take-up studs pass away from said thread-guides bights of thread are formed by
95 said take-up pins or studs and said thread eyes or guides by deflecting the two limbs or sections of thread extending between said thread-guides away from the latter, so that when the parts have arrived in the positions denoted by
Fig. 3 the slack is partly taken up, and when the rotary take-up has arrived at the position de-
100 noted in Fig. 4 the extreme take-up movement has been effected and the stitch is fully tightened. The entire take-up or stitch-tightening movement is thus accomplished in a quarter-
105 rotation of the driving-shaft or slightly less. As the parts move forward from the position shown in Fig. 4 to the position shown in Fig. 5, causing the take-up pins or studs to again
110 approach the said thread-guides a and e , the thread is slackened, the needle at this time descending for the formation of the next succeeding stitch, and the thread-controlling
115 pins or studs d^6 , d^{16} , and d^7 at this time serve to control the slack thread, so that it will not be given up too rapidly. By the time the shuttle has taken the next loop of thread from
the needle the adjustable take-up pin or stud d^7 will have arrived in a position directly be-
120 neath the thread-guide a and will thus have yielded up the entire slack thread controlled thereby, the slack controlled by the pin d^6 having been previously yielded up, and before
the shuttle will have quite arrived at its next cast-off position, as shown in Fig. 2, the thread-
125 controlling pin or stud d^{16} will have arrived in line with the thread-guide e and will have thus yielded up the entire slack needle-thread which it controls. During this thread-slack-
130 ening operation and while the needle-bar is rising and the shuttle is entering the loop of needle-thread the pull-off studs or pins d^{11} will have acted upon the needle-thread run-
ning between the thread-guide a and the ten-
sion device in such a manner as to have

drawn a sufficient supply of needle-thread through the tension device for the next succeeding stitch.

The invention is not to be understood as being limited to the details of construction herein shown and described, as for coöperation with a different form or differently-timed shuttle from that with which the machine herein partly illustrated is provided somewhat differently-located but oppositely-acting take-up pins or studs on the rotary take-up device or wheel might be employed. Also instead of using two diametrically-arranged take-up pins or studs and a rotary take-up device or wheel comprising three separated disks, affording two thread-passages between them, as herein shown and described, the number of disks might be increased, and as by adding a fourth or even more, and in the case of the addition of the fourth disk a somewhat different arrangement thereof might be desirable or necessary.

It will thus be understood that the invention consists, broadly, in a rotary take-up provided with a plurality of eccentrically-located take-up pins or studs preferably in combination with eccentrically-located slack-controlling pins or studs for coöperation with the take-up elements in properly controlling the needle-thread at all times.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up device having a plurality of oppositely-acting rotary take-up pins or parts, and coöperating stationary thread-guides, whereby a plurality of bights are simultaneously formed in the needle-thread in tightening the stitches.

2. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up device having a plurality of oppositely-acting rotary take-up pins or parts, and coöperating stationary thread-guides, whereby a plurality of take-up bights are simultaneously formed in the needle-thread in tightening the stitches, and a plurality of slack-controlling pins or parts on said rotary take-up whereby the slack thread is slowly given up as required by the shuttle.

3. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up device having a plurality of oppositely-acting take-up pins or parts, and coöperating stationary thread-guides, whereby a plurality of bights are simultaneously formed in the needle-thread in tightening the stitches, and a plurality of slack-controlling pins or parts on said rotary take-up whereby the slack thread is slowly given up as required by the shuttle, one of said slack-controlling pins or parts being adjustable in and out on said rotary take-up to vary its action.

4. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-

up comprising separated disks or parts affording a plurality of thread-passages between them, a plurality of rotary take-up pins or studs between said disks, and one in each thread-passage, and stationary thread-guides coöperating with the said rotary take-up pins or studs.

5. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up comprising three separated disks affording two thread-passages between them, and two oppositely-disposed take-up pins or studs eccentric to the axis of said rotary take-up, one of said take-up pins or studs in each of said thread-passages, and stationary thread-guides and rotary controlling pins or studs coöperating with said take-up pins or studs.

6. In a sewing-machine, the combination with a main shaft and stitch-forming devices operated therefrom, of a rotary take-up connected with said shaft to perform one rotation to each rotation of said shaft, said rotary take-up being provided with a plurality of oppositely-acting take-up pins or parts, and stationary thread-guides in coöperation with which a plurality of take-up bights of needle-thread are simultaneously formed by said take-up pins or parts in tightening the stitches.

7. In a sewing-machine, the combination with a main shaft and stitch-forming devices operated therefrom, of a rotary take-up connected with said shaft to perform one rotation to each rotation of said shaft, said rotary take-up being provided with a plurality of oppositely-acting take-up pins or parts, thread-guides in coöperation with which a plurality of bights of needle-thread are simultaneously formed by said take-up pins or parts in tightening the stitches, and a plurality of slack-controlling pins or parts on said rotary take-up and by means of which slack-controlling pins or parts the take-up is enabled to slowly yield slack thread as required by the shuttle.

8. In a sewing-machine, the combination with the stitch-forming devices, of a rotary take-up comprising three connected but separated disks affording two thread-passages between them, oppositely-arranged take-up pins or studs carried by said rotary take-up and one in each of said thread-passages, and thread-guides at the opposite peripheral edges of said rotary take-up to coöperate with said take-up pins or parts.

9. In a sewing-machine, the combination with the stitch-forming devices, of a rotary take-up comprising three connected but separated disks affording two thread-passages between them, oppositely-arranged take-up pins or studs carried by said rotary take-up and one in each of said thread-passages, and thread-guides at the opposite peripheral edges of said rotary take-up to coöperate with said take-up pins or parts, one of said thread-guides having two thread-eyes registering

with the thread-passages between said disks and a bridge portion registering with the central disk.

10. In a sewing-machine, the combination
5 with stitch-forming devices, and stationary thread-guides, of a rotary take-up provided with a plurality of oppositely-acting take-up pins or parts, a plurality of slack-controlling pins or parts and an eccentrically-arranged
10 pull-off pin or stud which at each rotation of said take-up draws thread from the said thread-supply for the next succeeding stitch.

11. In a sewing-machine, the combination
15 with stitch-forming devices, of a rotary take-up wheel arranged in front of the face-plate of the machine and connected with the needle-bar-operating shaft, said take-up comprising three separated skeleton disks affording two thread-passages between them, op-
20 positely-arranged take-up pins or studs on said wheel, one in each of said thread-passages, and oppositely-arranged slack-controlling pins or studs also on said wheel and one in each of said thread-passages, and station-
25 ary thread-guides cooperating with said take-up and slack-controlling pins or studs.

12. In a sewing-machine, the combination with the needle-bar-operating shaft B, of a

rotary take-up wheel connected with said shaft to rotate therewith and comprising the 30 separated skeleton disks d , d' and d'' , the oppositely-arranged take-up pins or studs d^1 and d^5 and the slack-controlling pins d^6 , d^{16} and d^7 , and stationary thread-guides a and e , said thread-guide a being provided with the 35 separated thread-eyes a' and a^2 .

13. In a sewing-machine, the combination with the needle-bar-operating shaft B, of a rotary take-up wheel connected with said shaft to rotate therewith and comprising the 40 separated skeleton disks d , d' and d'' , the oppositely-arranged take-up pins or studs d^1 and d^5 and the slack-controlling pins d^6 , d^{16} and d^7 , and stationary, thread-guides a and e , said thread-guide a being provided with the 45 separated thread-eyes a' and a^2 ; the said rotary take-up wheel also comprising the ring d^3 separated from the said disk d and between which ring and disk is one or more pull-off pins or studs d^{11} . 50

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

JOHN HEBERLING.

Witnesses:

J. Z. CULVER,

GEORGE A. GILLET.