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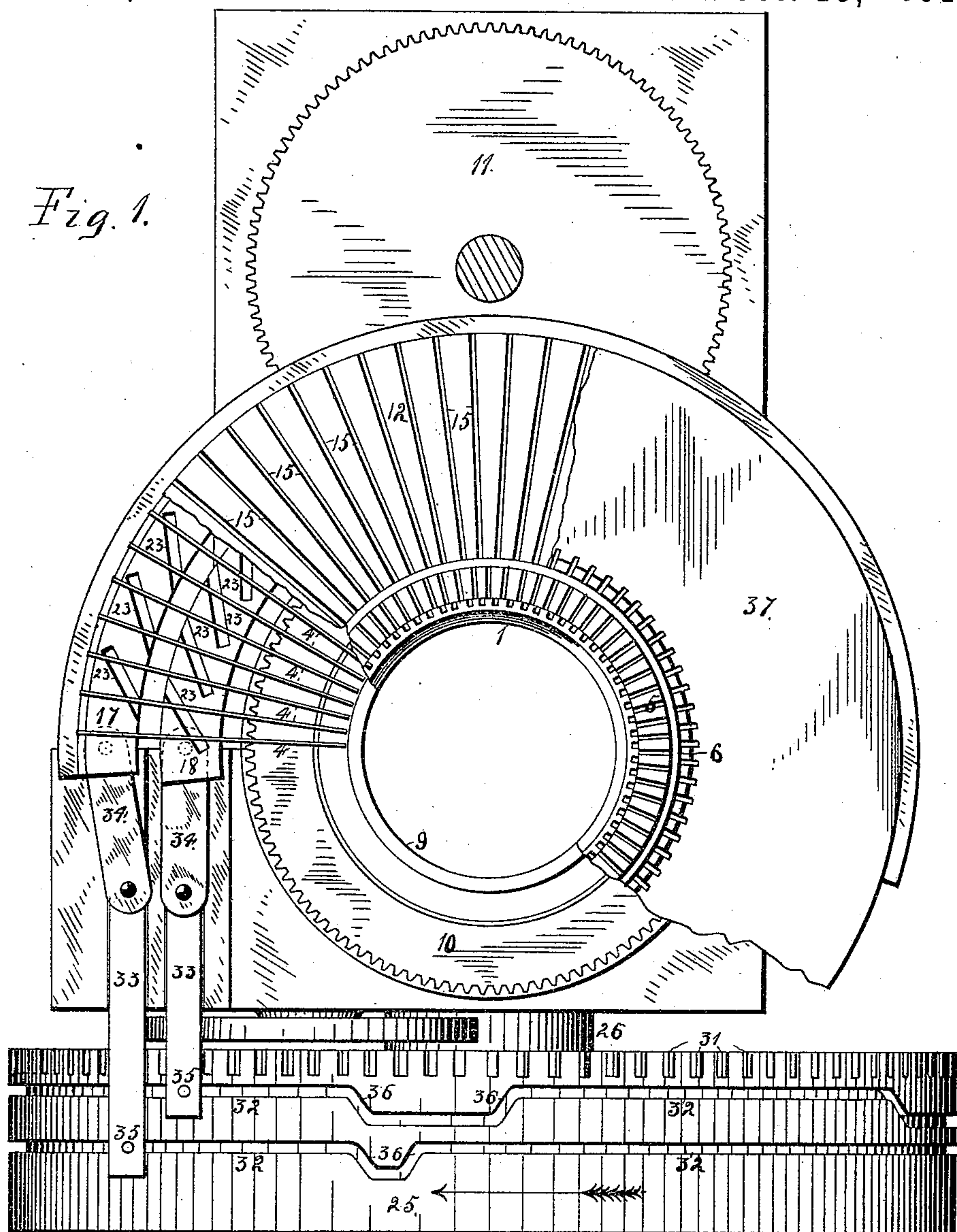
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N. J. WINLUND & E. McSHERRY.
KNITTING MACHINE.

No. 461,211.

Patented Oct. 13, 1891.

Fig. 1.



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E. Behel

Inventors:

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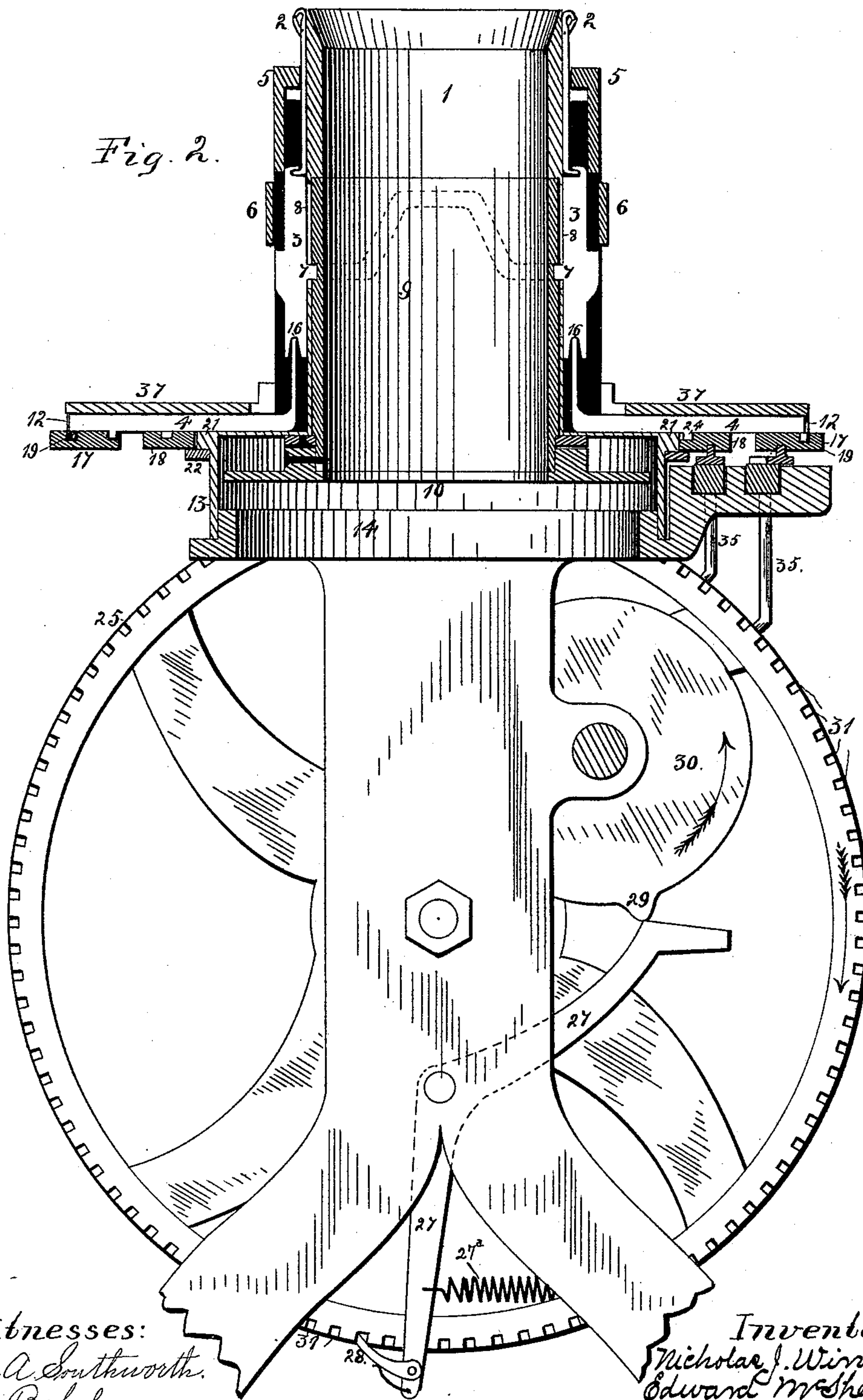
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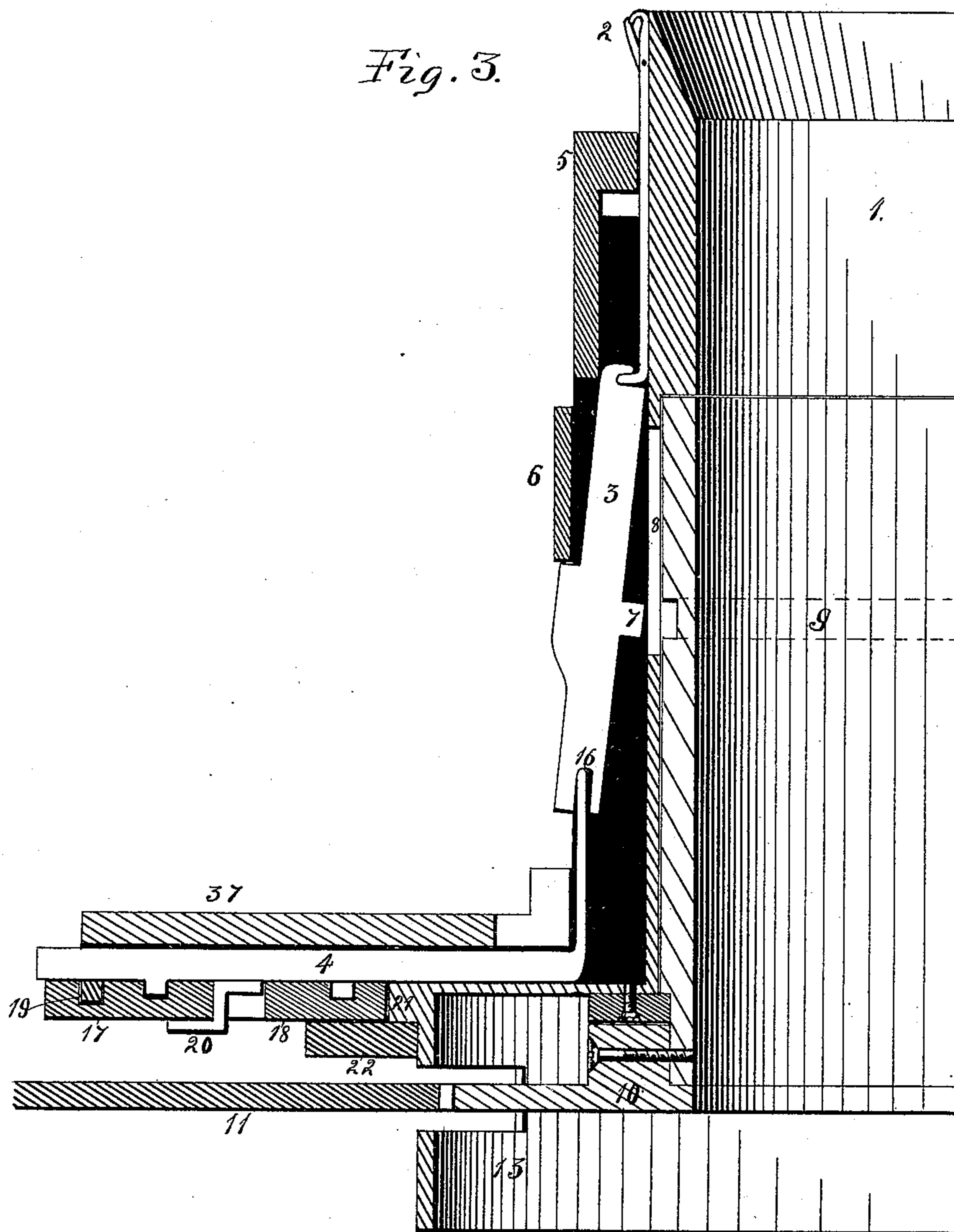
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UNITED STATES PATENT OFFICE.

NICHOLAS J. WINLUND AND EDWARD MCSHERRY, OF ROCKFORD, ILLINOIS,
ASSIGNORS OF ONE-THIRD TO HENRY W. PRICE, OF SAME PLACE.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 461,211, dated October 13, 1891.

Application filed October 6, 1890. Serial No. 367,165. (No model.)

To all whom it may concern:

Be it known that we, NICHOLAS J. WINLUND, a subject of the King of Sweden, and EDWARD MCSHERRY, a citizen of the United States, both residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification.

10 The object of this invention is to automatically throw the needles into and out of action during the process of knitting; and it consists of a segment or segments having inclined guideways, in which the sub-jacks rest, said
15 segments having a connection with a pattern-wheel, which imparts an oscillatory movement thereto and causes the sub-jacks to move radially, and by reason of the sub-jacks having a connection with the needles through the medium of a jack the jacks are thrown into engagement with their operating-cam or withdrawn therefrom.

In the accompanying drawings, Figure 1 is a plan view of a knitting-machine embodying
25 our invention, in which portions are broken away to more clearly show the operating mechanism. Fig. 2 is a transverse vertical central section through the same, showing the construction and connection of the operating
30 parts. Fig. 3 is a vertical lengthwise central section through the needle-cylinder, showing the jack out of action.

The knitting-machine herein shown is of the circular variety, and has its needle-cylinder 1 standing in a vertical position, which
35 has its outer surface longitudinally grooved for the reception of needles 2, jacks 3, and sub-jacks 4. The needles are held in position by a ring 5, slipped over the upper end of the cylinder, and a ring 6 holds the jacks in position in their grooves, all of which forms the subject-matter of Letters Patent No. 451,286,
40 granted April 28, 1891, to N. J. Winlund, and is no part of this case. The needles are raised and lowered through the medium of a projection 7, extending from the jack through vertical slots 8, extending through the needle-cylinder and entering a cam 9, located within the central opening of the needle-cylinder.
50 The lower end of the cam has a toothed wheel

10, which is secured thereto and meshes with the teeth of a wheel 11, from which it receives the required motion necessary for the production of knitted fabrics. The needle-cylinder has a laterally-extending base 12, from
55 the under side of which depends a flange 13, which fits outside of an uprising flange 14 of the main supporting-frame. The base portion is formed with radial slots 15, in which move the sub-jacks. Each of these sub-jacks has its
60 inner end upturned and entering a groove of the needle-cylinder and also entering a notch 16, formed in the lower end of the jacks for a double purpose, to appear hereinafter.

On the under surface of the base are located two segments 17 and 18. The outer
65 segment has a groove in its upper face, into which is fitted a flange 19, depending from the under side of the base, so that the segment is free to oscillate in its connection
70 therewith, and is held in position by brackets 20, secured to the base. The inner segment 18 fits the hub portion 21, formed on the under side of the base, and is held in position
75 by a ring 22 in a manner free to oscillate. The upper surface of these segments is formed with a series of inclined grooves 23. The
80 grooves of the inner segment receive a projection 24, depending from the under side of each alternate sub-jack, and the grooves of the outer segment receive each alternate sub-jack in a like manner.

A pattern-wheel 25 is fitted to revolve on a support 26, extending from the main frame. An intermittent rotary movement is imparted
85 to this pattern-wheel by an arm 27, pivoted to the main frame and carrying a spring-actuated dog 28 near its lower end. The upper end is operated upon by a projection 29, extending from the periphery of a rotating disk
90 30. The disk is rotated by any prime mover, and in its revolutions the projection on the disk will come in contact with the upper end of the lever 27, forcing it down and causing
95 the dog to enter one of the notches 31, formed in the periphery of the pattern-wheel, thereby causing the wheel to move forward one notch. Spring 27^a retracts the arm 27, so
100 that the pawl 28 will engage the next tooth, and this movement is repeated at each revo-

lution of the cam-wheel. The face of the pattern-wheel is formed with annular grooves 32. The means for connecting the pattern-wheel with the segments 17 and 18 consists of sliding guides 33, held in grooves formed in the supporting-frame. To the guides are pivoted links 34, the free ends of which have a pivotal connection with the end of the segments. From the upper ends and under sides of these guides depend rods 35, which enter the grooves 32 of the pattern-wheel, the grooves of the pattern-wheel being of such form as to impart the desired movement to the segments. As the pattern-wheel revolves the rods 35 will follow in its grooves, and when a switch 36 is encountered the rod will be forced to follow, thereby imparting a reciprocating movement to the guide 33, and through the link 34 an oscillatory movement is imparted to the segments in a direction according to the incline of the switch. The oscillatory movement of the segments will cause the sub-jacks to move in their lengthwise direction by reason of the inclined grooves formed in the upper surface of the segments, and if moved outward by reason of their connection with the lower end of the jacks will cause the lower end of the jacks to move outward, thereby withdrawing the jacks from their engagement with the raising and lowering cam, which will hold the needle out of action. When the reverse movement of the segments occurs, the sub-jacks will be forced inward, causing the jacks to enter the cam, when the needles will be free to be raised and lowered by the action of the cam during the process of knitting.

In this specification we have shown two segments operated upon by a pattern-wheel; but it is evident that a greater or less number of segments can be employed, according to the style of the fabric to be produced.

When the machine is used to knit stockings, we prefer to connect one-half of the needles with the segments as a preliminary step to the operation of narrowing in forming the heel, and such needles as are connected with the segments are thrown out of or into action by the movement of the segments. A top plate 37 is placed over the sub-jacks, which prevents their flying out and holds them in engagement with the segments.

During the process of knitting the jacks will rise and fall as the cam engages them, and by having their lower ends slotted the upper end of the sub-jacks form a guide for the jacks until the projection on the edge of the jacks passes under the ring, when this ring will act to hold them in their grooves, and the

jacks in descending will engage the sub-jacks before they leave their contact with the ring.

It will be noticed that we have a positive movement of the jacks in throwing them in and out of action with the cam and that the needles are under positive control and are sure to be operated upon by the cam when necessary.

What we claim as our invention is—

1. In a knitting-machine, the combination of a needle-cylinder provided with grooves in which are located needles and jacks, the cylinder being provided with grooves extending therethrough, a cam operating upon the needles from the inside of the cylinder, and means for throwing the needles in and out of action, substantially as set forth.

2. In a knitting-machine, the combination of a needle-cylinder provided with grooves in which are located knitting-needles and jacks, a laterally-extending base, sub-jacks held by the base and located in grooves radiating from the needle-cylinder, a segment provided with inclined grooves or slots which receive the sub-jacks, and means for imparting an oscillatory movement to the segment for throwing the jacks into or out of engagement with their operating-cam, substantially as set forth.

3. In a knitting-machine, the combination of a needle-cylinder, knitting-needles located therein, a cam for operating the needles, a segment provided with guideways having a connection with the needles, and means for oscillating the segment, whereby two or more needles are simultaneously thrown into or out of engagement with the cam.

4. In a knitting-machine, the combination of a needle-cylinder, knitting-needles located therein, a cam for operating the needles, a segment provided with guideways having connection with the needles, and a pattern-wheel for oscillating the segment, whereby two or more needles are simultaneously thrown into or out of engagement with the cam.

5. In a knitting-machine, the combination of a needle-cylinder, knitting-needles located therein, a cam for operating the needles, a series of segments provided with guideways having a connection with the needles, and means for oscillating the segments, whereby the series of needles of any segment are simultaneously thrown into or out of engagement with the cam.

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