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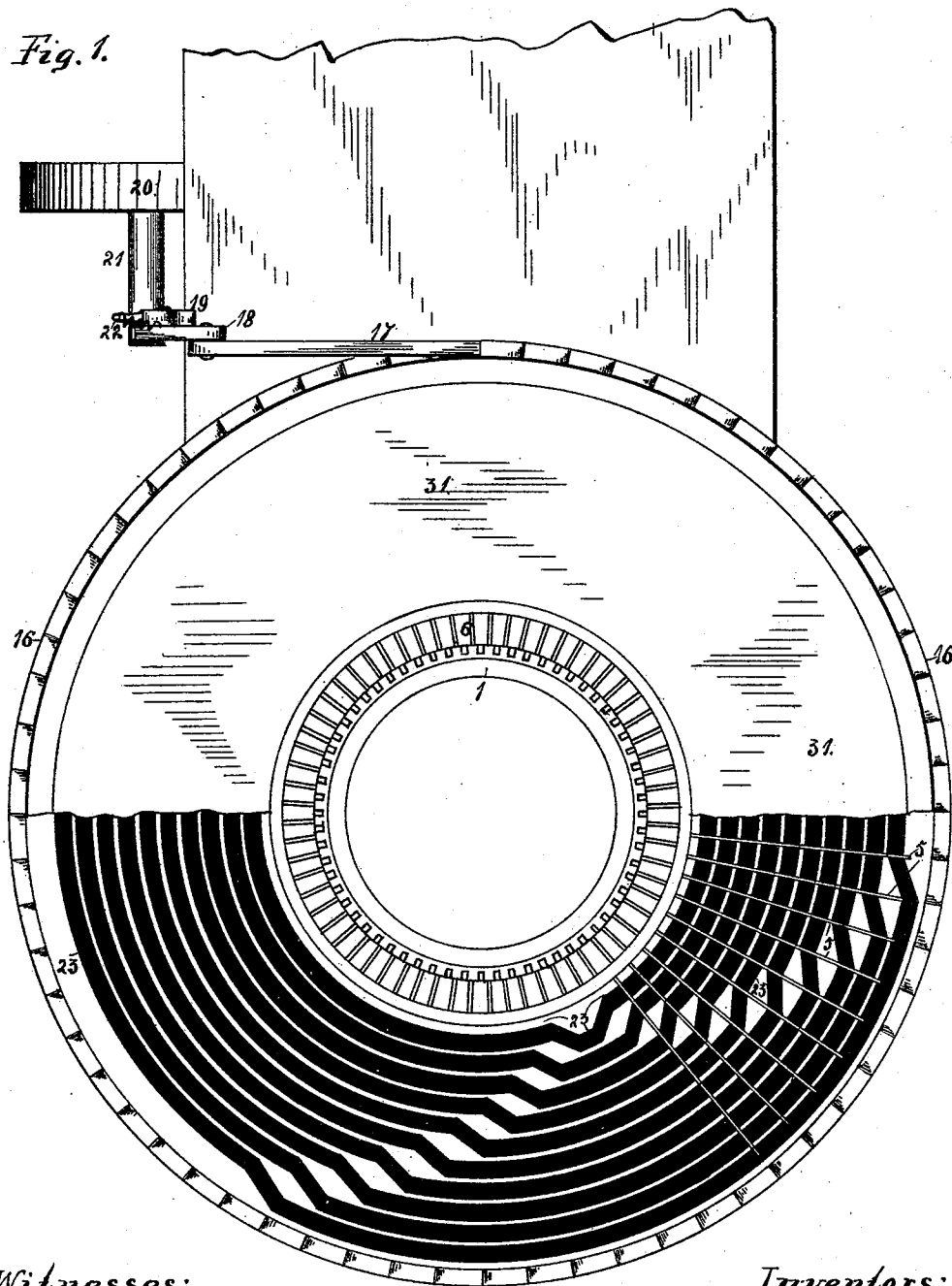
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N. J. WINLUND & E. McSHERRY.
KNITTING MACHINE.

No. 461,212.

Patented Oct. 13, 1891.

Fig. 1.



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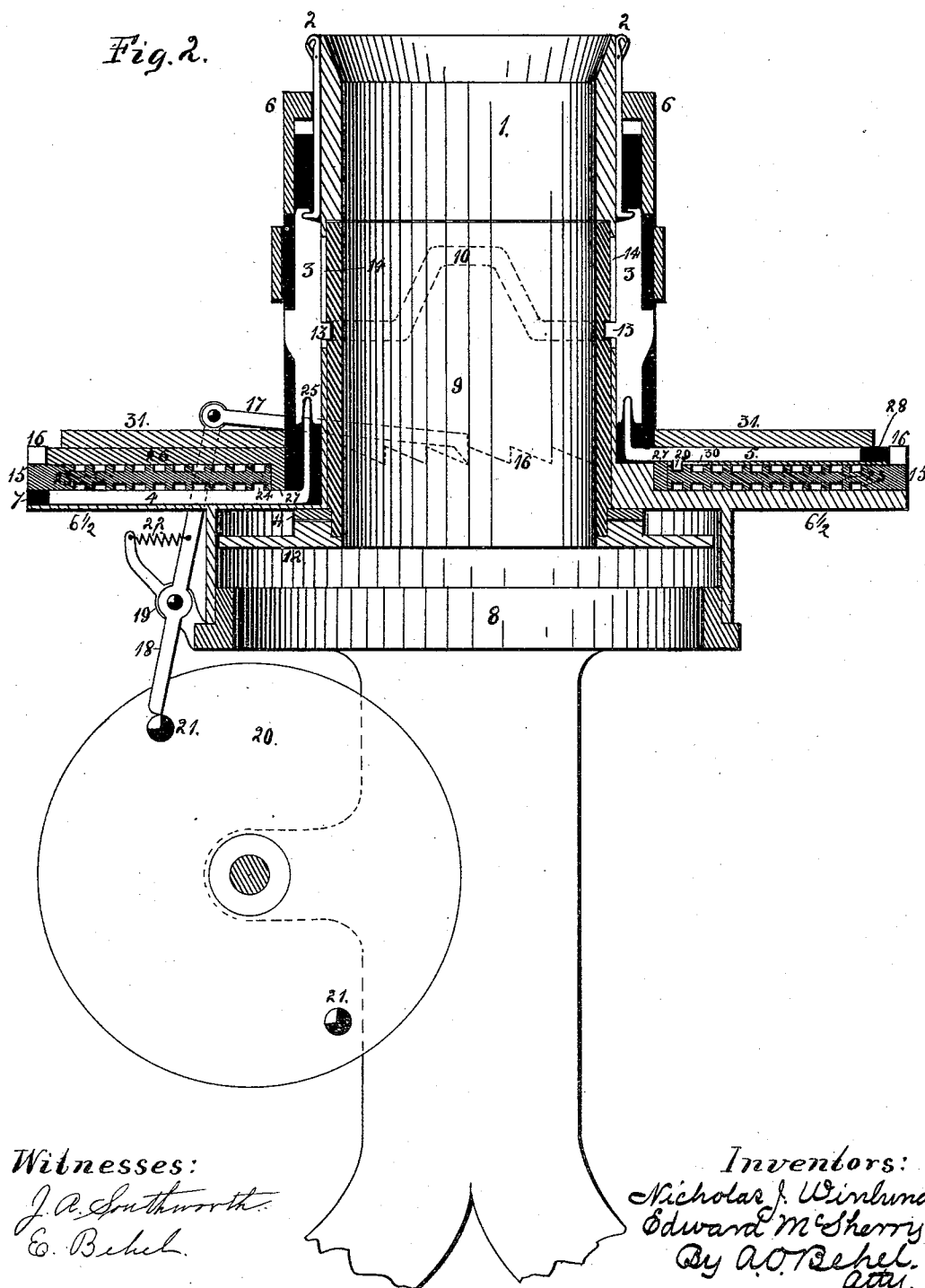
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N. J. WINLUND & E. McSHERRY.
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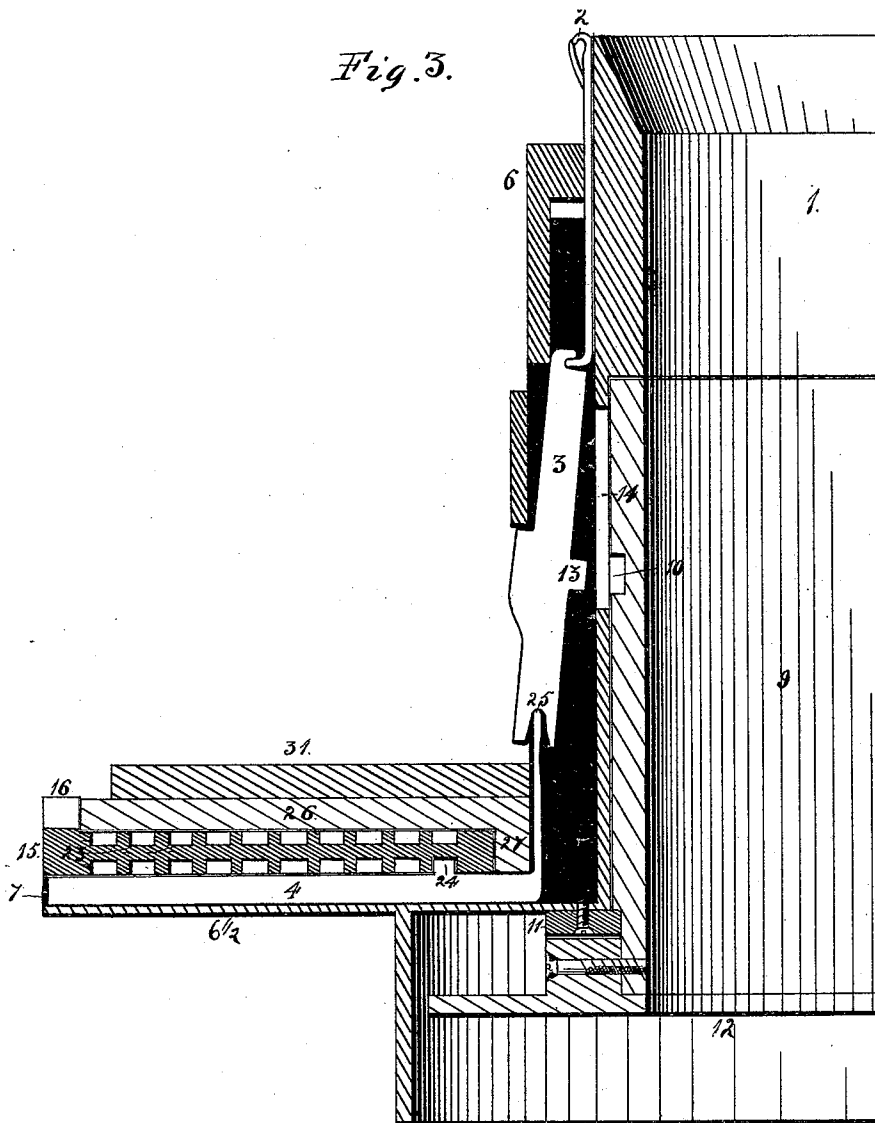
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KNITTING MACHINE.

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Fig. 3.



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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. 461,212, dated October 13, 1891.

Application filed October 14, 1890. Serial No. 368,113. (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 residents of 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.

The object of this invention is to automatically throw into action certain needles or to move them out of action during the process of knitting; and it consists of a disk pattern-wheel which is so located as to revolve around the needle-cylinder and is provided with grooves in which are located sub-jacks, so that in their movement of the pattern-wheel they are moved radially for the purpose of moving the jacks into or out of engagement with their operating-cam, which will throw the needles into or out of action.

In the accompanying drawings, Figure 1 is a plan view of a knitting-machine embodying our invention, in which a portion is broken away to show the upper surface of the pattern-wheel. Fig. 2 is a transverse vertical section through the needle-cylinder, showing the mechanism for throwing the needles into or out of action and the cam for raising or lowering them during the process of knitting. Fig. 3 is a section similar to Fig. 2, which clearly shows the position of the needles, jacks, and sub-jacks when the needles are out of action.

This invention relates to the class of knitting-machines known as the "circular variety," and consists of a needle-cylinder 1, standing in a vertical position, which has its outer surface longitudinally grooved for the reception of needles 2, jacks 3, and sub-jacks 4 and 5. A ring 6 is slipped over the upper end of the cylinder, and when in position holds the needles in working position in their grooves.

From the lower end of the needle-cylinder a base 6½ extends laterally, which has a portion of its upper surface provided with radial grooves 7, in which are located the sub-jacks 4. The needle-cylinder is supported upon a suitable frame 8. A needle-operating cam 9 is located within the central opening

of the needle-cylinder and has its outer surface formed with an annular groove 10, a portion of which is irregular in form, so that in its rotation or oscillation the irregular portion coming in contact with the needles will raise and lower them during the process of knitting. This cam is held in position by a collar 11, secured to the outside of the laterally-extending base, and a toothed wheel 12 is secured to the lower end of the cam, which meshes with the teeth of a similar toothed wheel (not shown,) from which motion is imparted to the cam. An inward projection 13 is formed on the jacks and extends through vertical openings 14, extending through the needle-cylinder and enters the grooves of the cam, and by means of which the needles are operated as the upper ends of the jacks engage the lower ends of the needles, and thereby any movement imparted to the jacks in their lengthwise direction will be transmitted to the needles.

The pattern-wheel 15, employed in connection with our construction of needle-cylinder, is of disk or plate form, and is located around the needle-cylinder in such manner that the cylinder forms the center around which the wheel revolves. This wheel is formed with a rim 16, rising from its outer edge on its upper surface, and is cut in saw-toothed form. An intermittent rotary movement is imparted to the wheel by a dog 17, pivoted at one end to a bar 18, which is pivoted between its ends to a stationary support 19. A rotary disk 20 has pins 21 projecting from its inner face, and as each pin comes in contact with the lower end of the bar 18 the upper end will be moved, carrying the dog with it, and in its movement the free end of the dog will engage the teeth of the pattern-wheel, moving it forward one notch, and after the pin has left its engagement with the arm 18 a spring 22 will retract the dog, ready to engage the next tooth. The upper and under side surfaces of the pattern-wheel are provided with grooves 23 of irregular form, some or all of which may be employed to control the throwing in and out movements of the fashioning-needles, thereby giving each of such needles a separate groove. The grooves on the under surface receive projections 24, rising from the upper surfaces of

the sub-jacks which play in the radial grooves formed in the upper surface of the laterally-extending base, and have their inner edges bent at substantially right angles to their main portion, and enter a notch 25, formed in the lower end of the jacks, so that a connection is formed between the needles and pattern-wheel.

A disk 26 is placed over the pattern-wheel so as to fit within the recess formed by the uprising ratchet-ring, and its inner edge is formed with a depending flange 27, which rests upon the laterally-extending base in such a manner as to permit the pattern-wheel to revolve beneath it. A portion of the upper surface of the disk 26 is provided with radial slots 28, in which sub-jacks 5 move lengthwise, depending projections 29, formed on the under edge of the sub-jacks, extending through slots 30 in the disk 26, and entering the grooves in the upper surface of the pattern-wheel. The sub-jacks have the same connection with the jacks and needles as has been described in relation to sub-jacks 4. A plate 31 is placed over the disk 26 to hold the sub-jacks 5 in their grooves.

In the rotation of the pattern-wheel the sub-jacks will follow the grooves therein, and when a switch is encountered the corresponding sub-jack will move lengthwise, and should the movement be outward the sub-jack will move the jack with which it is connected outward, causing it to become disengaged from its raising and lowering cam, thereby holding the needles out of action, and when the reverse movement is imparted to the sub-jacks by the pattern-wheel the projection upon the jack will enter the cam-groove, when the jack will be raised and lowered, carrying the needles with it during the process of knitting. In this instance we have connected only the fashioning-needles used to form the heel and toe of a stocking with the pattern-wheel, one half having a connection with the under side of the wheel and the others with the upper side, and each needle has a separate groove, so that its movements are independent of the others, and can be thrown into or out of action at any time it becomes necessary.

The grooves of the pattern-wheel can be varied according to the style of the knitting to be produced, and more or less needles can have a connection with the pattern-wheel in a like manner. It is also evident that a series of these pattern-wheels could be arranged one above the other, each to operate a portion of the needles, and other arrangement of devices can be employed to impart an intermittent rotary movement to the pattern-wheel.

We do not claim, broadly, in this application the sub-jacks located and moving radially and having a connection with the jack, in the manner shown and described.

We claim as our invention—

1. In a knitting-machine, the combination of a needle-cylinder, needles located therein, jacks and sub-jacks, and a disk pattern-wheel located outside of and around the cylinder, operating upon the needles through the jacks and sub-jacks to throw them into or out of action, said pattern-wheel provided with an independent cam-groove for each fashioning-needle, and the sub-jacks capable of a radial sliding movement, substantially as set forth.

2. In a knitting-machine, the combination of a needle-cylinder, needles located therein, a disk pattern-wheel located outside of and around the cylinder, operating upon the needles to throw them into or out of action, said pattern-wheel provided with an independent cam-groove for each fashioning-needle, and means for imparting movement to the pattern-wheel, substantially as set forth.

3. In a knitting-machine, the combination of a needle-cylinder, a double-faced pattern-wheel located outside of and around the needle-cylinder, and needles located in grooves formed in the needle-cylinder, a portion of which is operated from one face of the wheel and another portion from the opposite face, substantially as set forth.

4. In a knitting-machine, the combination of a needle-cylinder, needles located therein, a pattern-wheel located outside of and around the cylinder, operating upon the needles to throw them into or out of action, and a cam located within the needle-cylinder for raising or lowering the needles during the process of knitting, substantially as set forth.

5. In a knitting-machine, the combination of a needle-cylinder having a laterally-extending base, which is provided with grooves on its upper surface, jacks and needles, a pattern-wheel located over the base, said pattern-wheel provided with an independent cam-groove for each fashioning-needle, and sub-jacks located in the grooves of the base and engaging the pattern-wheel, said sub-jacks having a connection with the jacks and the jacks with the needles, whereby the movement of the pattern-wheel is transmitted to the jacks, substantially as set forth.

6. In a knitting-machine, the combination of a needle-cylinder in which are located needles and jacks, a double-faced pattern-wheel located outside of and around the cylinder, and sub-jacks having a connection with the wheel, some located above the wheel and some below, said sub-jacks having a connection with the jacks for throwing them into and out of engagement with their operating-cam, substantially as set forth.

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