

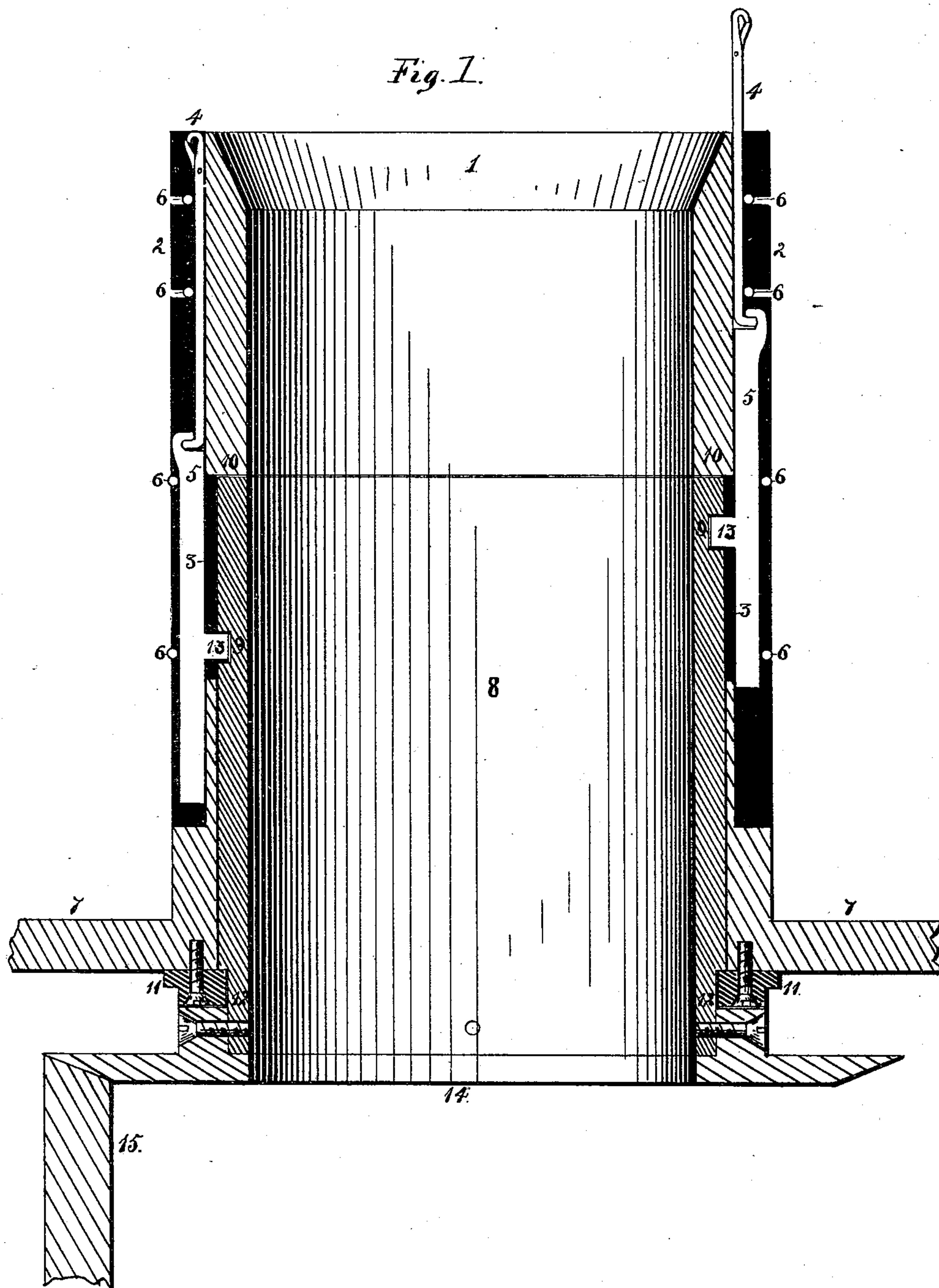
(No Model.)

3 Sheets—Sheet 1.

N. J. WINLUND.
CIRCULAR KNITTING MACHINE.

No. 451,285.

Patented Apr. 28, 1891.



Witnesses:
J. A. Southworth.
E. Behel.

Inventor:
Nicholas J. Winlund.
By A. O. Behel
attys.

(No Model.)

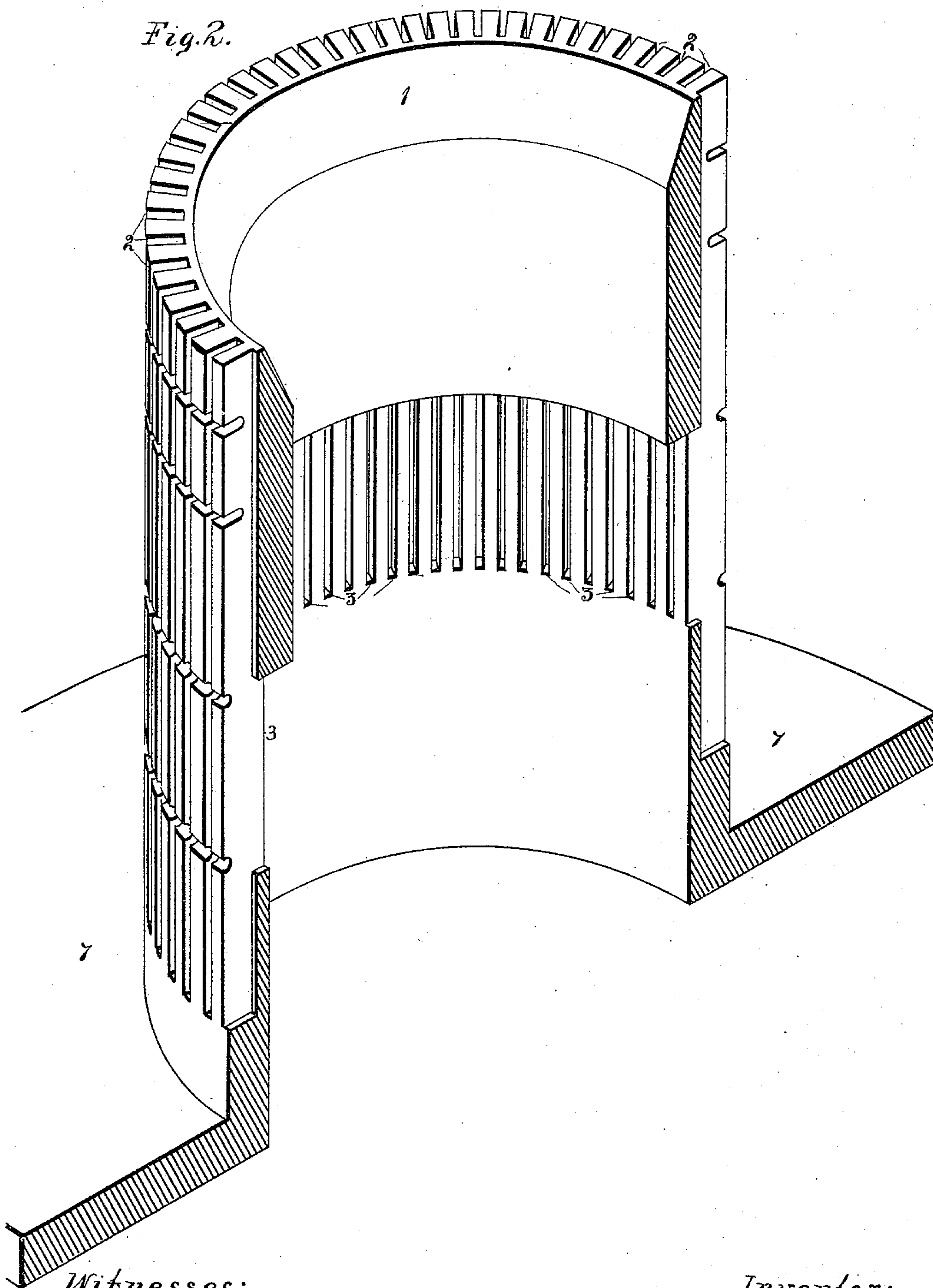
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Fig. 2.



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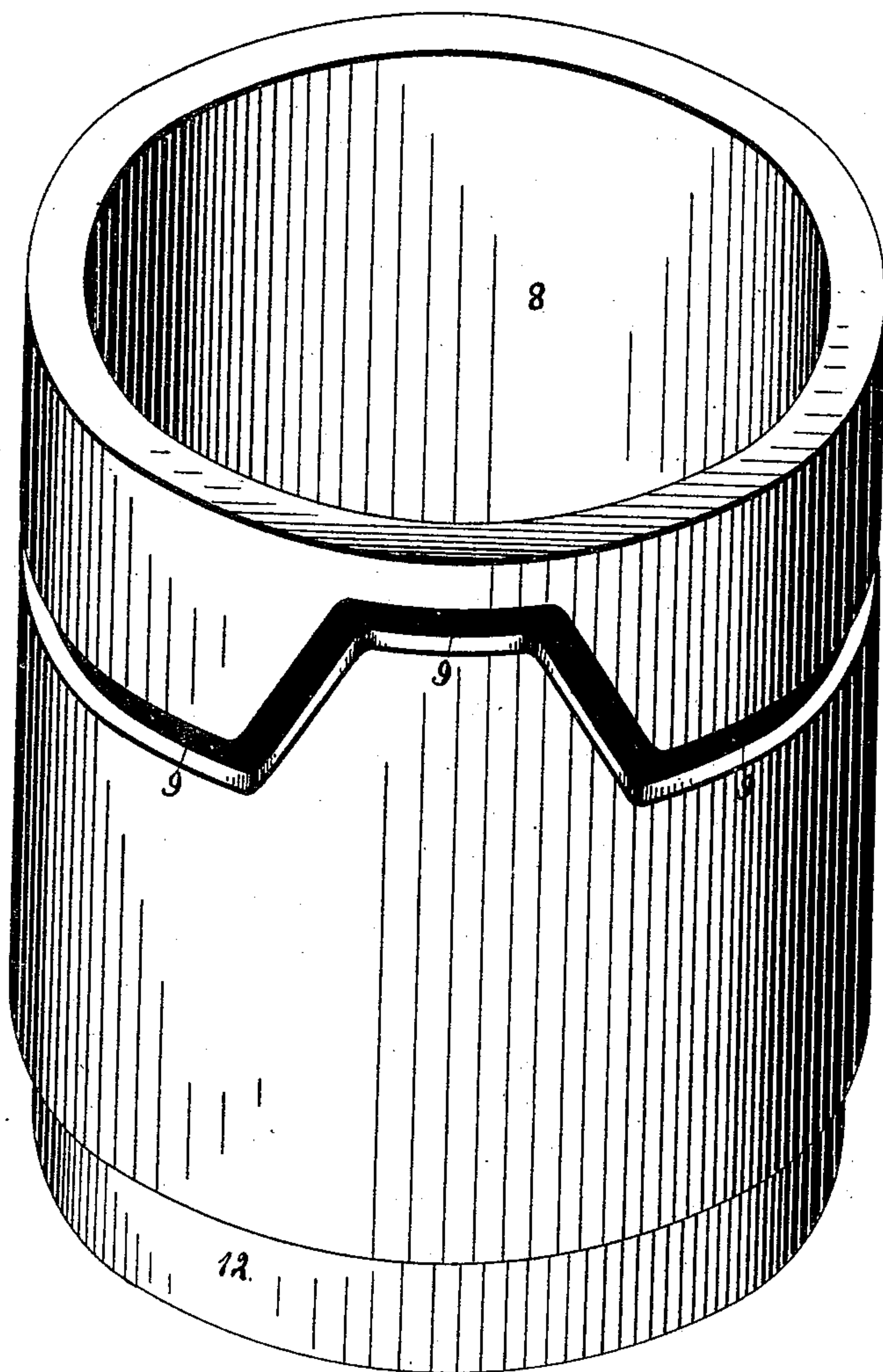
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Fig. 3.



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UNITED STATES PATENT OFFICE.

NICHOLAS J. WINLUND, OF ROCKFORD, ILLINOIS.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 451,285, dated April 28, 1891.

Application filed September 15, 1890. Serial No. 365,093. (No model.)

To all whom it may concern:

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

The object of this invention is to construct a knitting-machine of the circular variety, in which the needle-cylinder will be slotted in its lengthwise direction and through the slots the shanks of the needles or of the needle-jacks will project, and a cam will be located within the cylinder, so that in its rotary and oscillatory movement it will raise and lower the needles in the manner common to machines of this class.

In the accompanying drawings, Figure 1 is a vertical central section through the needle-cylinder and needle-operating cam. Fig. 2 is a vertical central section through the needle-cylinder. Fig. 3 is an isometrical representation of the cam employed to impart a reciprocating movement to the needles.

The needle-cylinder 1 in this instance stands in a vertical position when in use, and has its periphery formed with vertical needle-grooves 2, which extend nearly the length of the cylinder, a section 3 of each of the needle-grooves extending through the needle-cylinder, and the length of the sections 3 is the length of the throw of the needles. Within the needle-grooves are placed knitting-needles 4, and in this instance jacks 5 are employed, so that the usual construction of needle can be used. These jacks engage the lower portions of the needles, and their function is to form a connection between the needles and the cam employed to raise and lower the needles.

Bands 6 are employed to hold the needles and jacks in their position in the grooves in the needle-cylinder. A base 7 extends from the lower end of the needle-cylinder and forms a support for the cylinder, which can be secured in position in any convenient manner.

A needle-operating cam 8 is shown at Fig. 3, which in this instance consists of a cylinder having its outside diameter equal to the inside diameter of the needle-cylinder within which it is placed.

The periphery of the cam-cylinder is formed with a groove 9, which is of irregular form and extends around the cylinder. This cylinder is placed within the needle-cylinder, and when in position its upper end comes in contact with an inward projection 10 of the cylinder, which has an inside diameter equal to the inside diameter of the cam-cylinder. This cam-cylinder is held in its position within the needle-cylinder by a collar 11, which fits its reduced lower end 12, said collar being secured in place by screws, as shown, to the under side of the supporting-flange of the needle-cylinder. The cam-cylinder held in this manner is free to rotate and oscillate.

The projections 13 of the jacks extend through the lengthwise grooves of the needle-cylinder and enter the cam-groove of the cam-cylinder, so that as the cam-cylinder oscillates or rotates the needles will be raised or lowered when the cam portion of the cylinder comes in contact with the projections. To the lower end of the cam-cylinder is secured by screws, as shown, a bevel gear-wheel 14, which meshes with the bevel-gear 15, from which it receives its motion. By constructing a needle-cylinder in this manner and locating a cam on the inside I am able readily to remove any one of the needles without disturbing their operating-cam and to protect the cam from dirt.

I claim as my invention—

1. In a knitting-machine, the combination of a needle-cylinder, cylinder needles upon the outside of the cylinder, and a cam operating upon the needles from the inside of the cylinder for the purpose of raising and lowering the needles in the process of knitting, substantially as set forth.

2. In a knitting-machine, the combination of a needle-cylinder provided with needle-grooves having sections extending through the cylinder, and a needle-cam operating upon the needles from the inside of the cylinder for the purpose of raising and lowering the needles in the process of knitting, substantially as set forth.

3. In a knitting-machine, the combination of a needle-cylinder provided with needle-grooves having sections extending through the cylinder, and a cylinder located within the needle-cylinder, said cylinder provided

with a cam which engages the needles, raising and lowering them in the process of knitting, substantially as set forth.

4. In a knitting-machine, the combination
5 of a needle-cylinder provided with needle-grooves having sections extending through the cylinder, and a cylinder located within the needle-cylinder, provided with a cam on its periphery, which engages the needles, rais-

ing and lowering them in the process of knit- 10
ting, and means for imparting the required movement to the cam-cylinder, substantially as set forth.

NICHOLAS J. WINLUND.

Witnesses:

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