

(No Model.)

T. LANGHAM.
KNITTING MACHINE.

No. 325,943.

Patented Sept. 8, 1885.

FIG. 1.

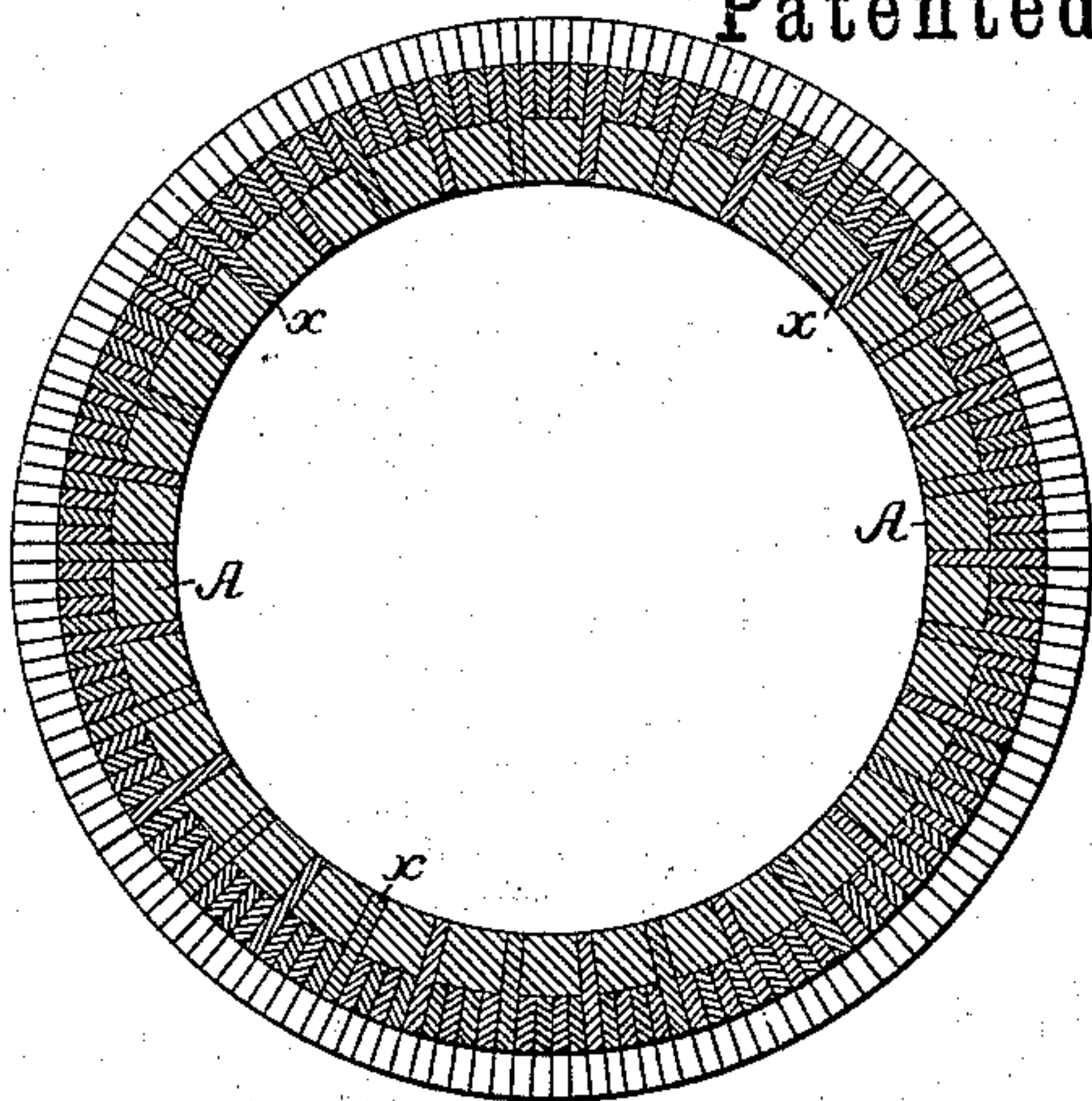


FIG. 2.

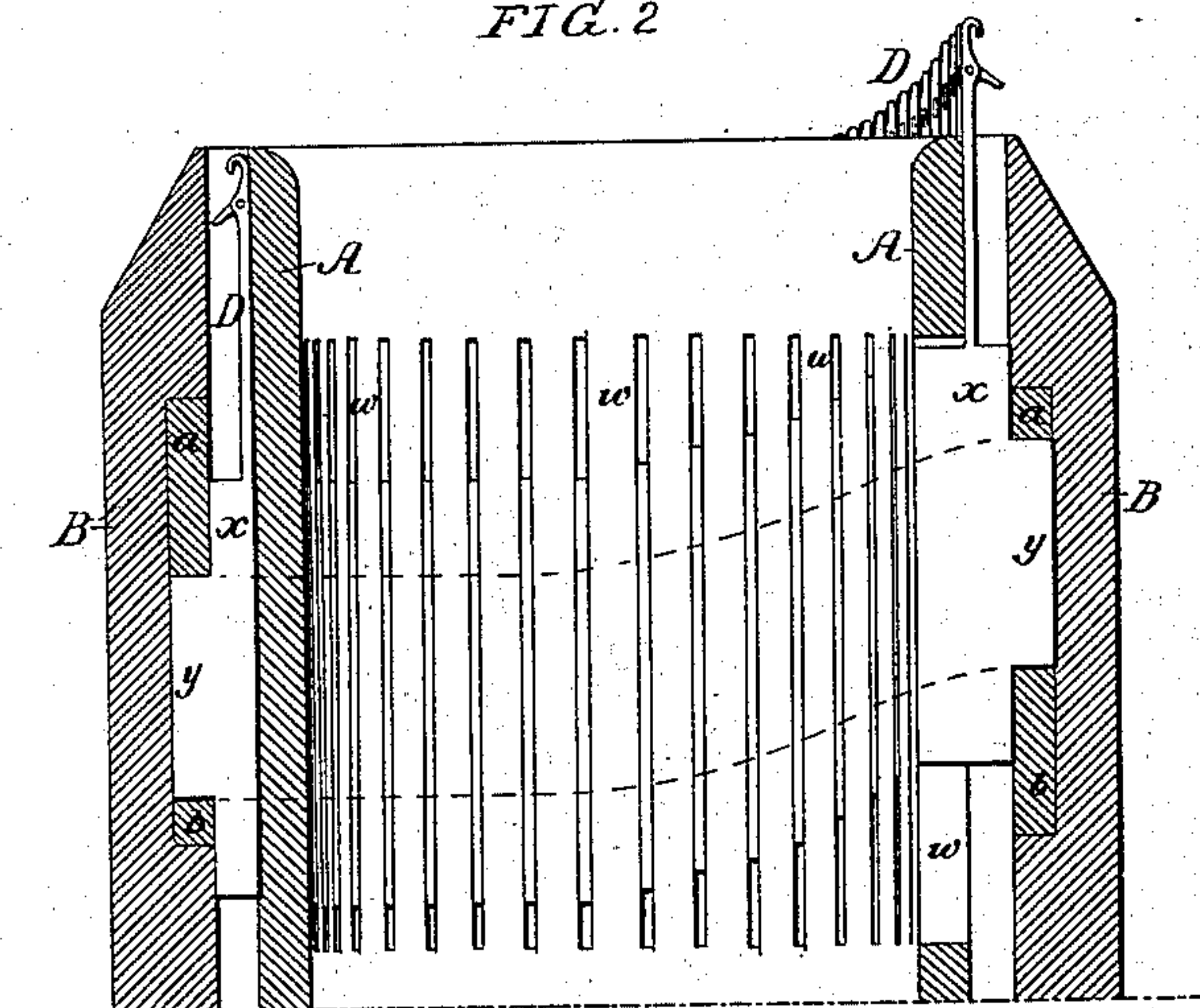
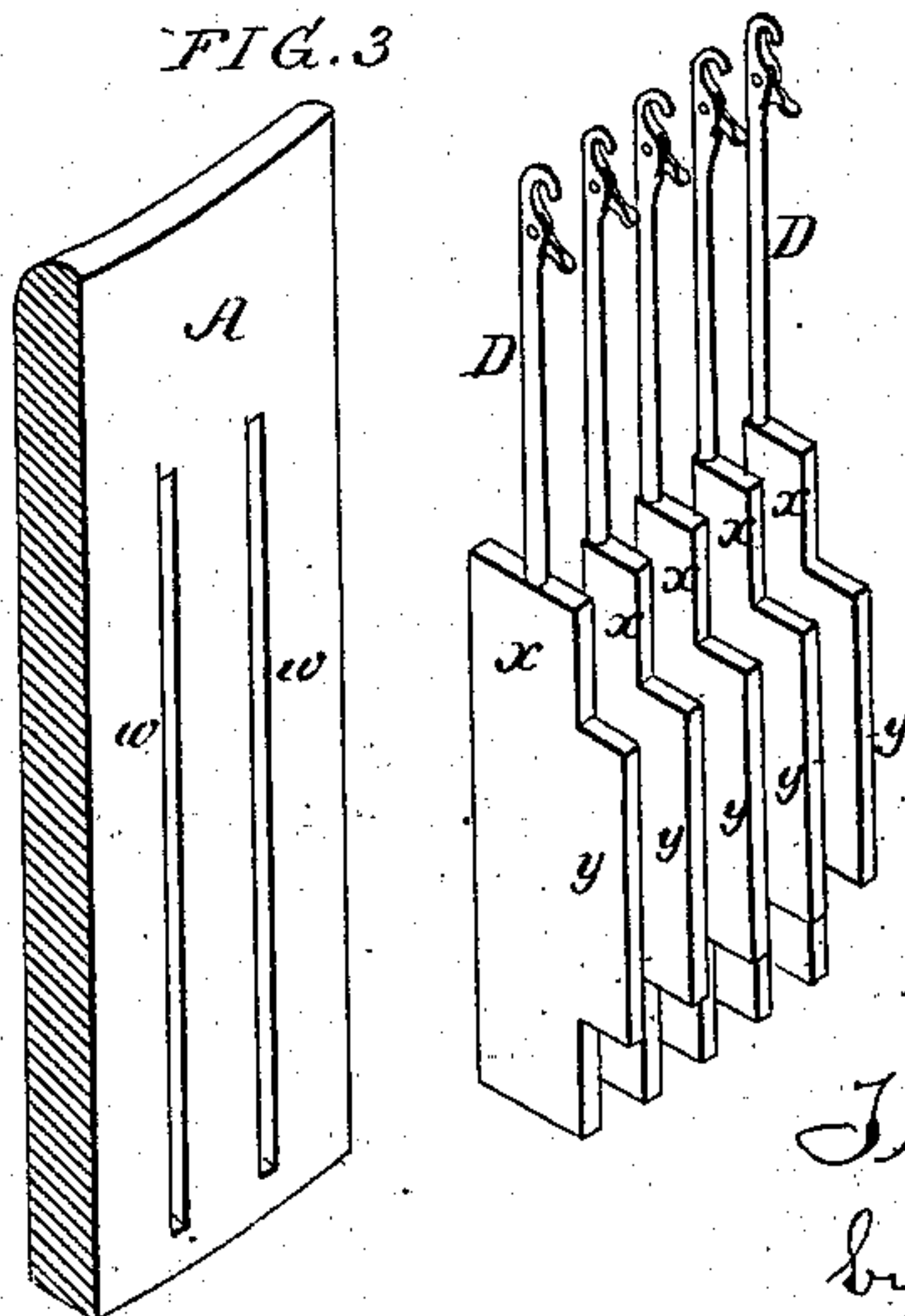


FIG. 3.



Witnesses:
John M. Clayton.
Harry Drury

Inventor:
Thomas Langham
by his Attorneys
Howson & Son

UNITED STATES PATENT OFFICE.

THOMAS LANGHAM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO ALFRED OLIVER, OF SAME PLACE.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 325,943, dated September 8, 1885.

Application filed September 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS LANGHAM, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Knitting-Machines, of which the following is a specification.

The object of my invention is to make a knitting-machine of finer gage than usual—that is to say, having a greater number of needles to the inch; and this object I attain by dispensing with the usual fixed partitions between the needle-jacks.

In the accompanying drawings, Figure 1 is a sectional plan view of the needle-cylinder of a knitting-machine provided with needles in accordance with my invention; Fig. 2, a transverse section showing also the outer cam-cylinder; and Fig. 3 a perspective view of part of the needle-cylinder and some of the needles.

A is the needle-cylinder; B, the outer cam-cylinder having upper cams, *a*, and lower cams, *b*, as usual; and D are the needles having jacks *x*, with bits *y*, adapted to the space between the upper and lower cams, so that as the cylinder A is rotated the needles will be raised and lowered, as usual. Usually the cylinder A is cut so as to present around its entire periphery alternating ribs and grooves, the needle-jacks sliding in said grooves and being separated from each other by the ribs. In order to make a machine of finer gage than usual, I dispense with these ribs and use a plain cylinder, around which the needles are placed side by side, the jacks *x* sliding in contact with each other, the waste of space due to the presence of the ribs being thus avoided and the gage of the machine being limited only by the thickness of the needle-jacks.

In order to prevent the entire set of needles from slipping circumferentially on the cylinder, I form in the same, at intervals, radial slots *w*, the jacks of some of the needles projecting into these slots, as shown in Figs. 1 and 2.

While the main object of my invention, as above stated, is to make a machine of finer gage than usual, there may be mentioned, as other advantages, the reduction in the expense of making the machine, due to the discarding

of the ribbed and grooved cylinder, and the greater ease of working, owing to the fact that the friction is much less than in machines in which the needle-jacks bear against a fixed rib during their entire movement.

The supporting-jacks—that is to say, those jacks which are guided in the slots of the cylinder—need not necessarily be provided with needles, although it is preferable to furnish these jacks with needles as well as the others.

My invention is applicable to straight machines or rib-frames, as well as to circular machines; hence, although I have shown the needles on a cylinder, I have in the claims used the term “needle-carrier” to indicate that part of the machine on which the needles are guided as they are moved by the cams.

I am aware that it has been proposed to dispense with the usual ribbed bars and cylinders of knitting-machines by alternating with the needles short bits controlled by the cams in the same manner as the needles; but in this case there is the same separation of the needles as in the usual machines; hence the machine cannot be made as fine in gage as when the needles are placed side by side with their jacks in contact as in my machine. Moreover, in the machine which has been proposed, the needles were prevented from moving circumferentially or longitudinally by fixed ribs on the carrier, whereas in my machine, the supporting-jacks are guided in the slots of the carrier and are under the influence of the cams which operate the needles.

I am also aware that in barbed-needle machines the needles have been placed on the carrier with their jacks or stems side by side and in contact; but such machines are essentially different from that forming the subject of my invention, in that the needles have no vertical reciprocating movement on the carrier, whereas my invention is an improvement on the ordinary latch-needle machine, in which the needles have such movement and must necessarily be guided.

I therefore claim as my invention—

1. The combination of the needle-carrier of a knitting-machine, having slots *w*, needle-operating cam or cams, needles placed side by side on the carrier, and having their jacks in contact and under control of said cam or cams,

and supporting-jacks guided in the slots of the carrier and also under the control of the needle-operating cam or cams, as set forth.

2. The combination of the needle-carrier of
5 a knitting-machine, having slots *w*, the needle-operating cam or cams, and needles placed side by side on the carrier with their jacks in contact, said jacks being under control of the cam or cams and some of the needle-jacks
10 entering the slots *w*, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS LANGHAM.

Witnesses:

JOHN M. CLAYTON,
HARRY SMITH.