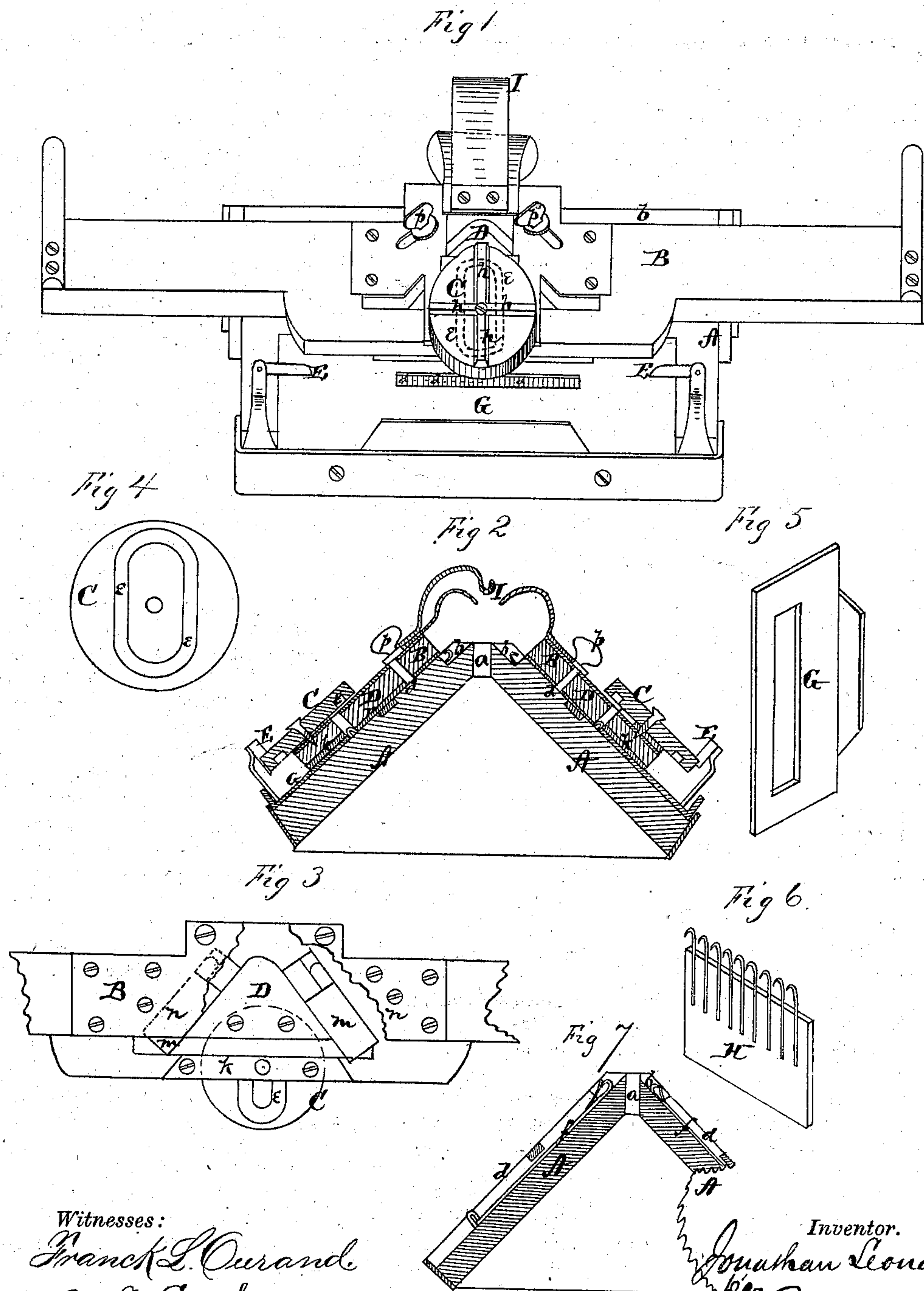


J. LEONARD.
Knitting-Machines.

No. 135,823.

Patented Feb. 11, 1873.



Witnesses:
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UNITED STATES PATENT OFFICE.

JONATHAN LEONARD, OF ATTICA, OHIO.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. 135,823, dated February 11, 1873.

To all whom it may concern:

Be it known that I, JONATHAN LEONARD, of Attica, in the county of Seneca and in the State of Ohio, have invented certain new and useful Improvements in Knitting-Machines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The nature of my invention consists in certain improvements upon what is known as the straight knitting-machine, in contradistinction to the circular machine, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side elevation, and Fig. 2 a transverse vertical section of my machine. Fig. 3 is a view of the inner side of the carriage. Figs. 4, 5, 6, and 7 are detached views of certain parts of the machine.

A represents the needle-bed, having its sides inclined at right angles toward each other, with an open space or slot, *a*, in the center, running from end to end of the bed. Upon the upper edge, where the knitting is done, and on each side of the bed, is formed a rabbet, *b*, three-eighths of an inch wide, and nearly three-sixteenths deep, and on a plane or level with the bottom of the grooves in which the needles work. This brings the ribs or guides *d* between the needles so near the top of the needle-bed, where the stitches are formed, that the needles will be firm and well supported, and the stitch-dividers, which are used on most machines using the latch-needle, are dispensed with.

The advantages arising from this construction of the needle-bed are threefold: First, it removes all obstructions from the work, so that it can readily be seen by the eye, and in narrowing, widening, or fancy work there is a straight edge to work on, without any obstruction or hinderance in changing the stitches from one needle to the other; this widening and narrowing are necessarily involved in heeling and toeing. Second, it saves an unnecessary expense in the construction of the stitch-dividers; and, third, it allows the stitches to be

brought closer together than can be done where the stitch-dividers are used. I prefer to make the distance between the needles in this machine one-sixteenth of an inch, and I can therefore knit very fine goods, and at the same time, by withdrawing every other needle, can do coarse work equally as well on the same machine. The design of the rabbet is, further, to give room for the needle-latches to work without being obstructed or injured by coming in contact with the ribs between the needle-grooves.

B represents the carriage placed on the bed A, and moving back and forth on the same. In the center, upon each side of this carriage, is pivoted a wheel, C, having on its under side a cam-groove, *e*, in which a pin attached to the V-shaped cam D works. This wheel throws the cam up and down, so that it will operate the needles *f f*, or not, as may be desired. The needles *f f* are the well-known latch-needles, and need no description. The cam D is held by suitable guides in a V-shaped mortise in the carriage, so that it can move up and down in the same. On the upper or outer side of the wheel C is a cross, making four arms, *h h*, which arms, as the carriage is moved back and forth, come in contact with latches E E at the ends of the machine, turning the wheel one-quarter around, thereby throwing the cam D either up or down. The advantage of this wheel is the accuracy, ease, and simplicity with which the machine can be regulated for round or tubular as well as flat work. The needle-elevators G consist each of a thin piece of tin or other material that rests on the needle-bed, and pushes the needles up ready to set up the work. The gathering-cam *k* on the under side of the carriage, at the lower edge, is dressed up enough to let the needle-elevator slip under it. The greatest advantage of these elevators is their simplicity and cheapness. H is the set-up, used for setting up stockings and other articles which it is desired to start with a selvage edge. It consists simply of a piece of tin, or other material, with wire hooks soldered onto it. On the center of the carriage, at the top, is a yarn-guide, I, made stationary so as to do away with all springs and complicated appliances incident to the employment of a movable yarn-guide. On the under side of the carriage is attached the face-plate *n*,

which is to be one-eighth of an inch thick. On the inner side of this plate, and at either side of the cam, the plate is cut away one-sixteenth of an inch deep. In these cut-away parts are placed the stitch-lengtheners *m m*, which are made of thin plates of steel one-sixteenth of an inch thick on the inner edge, and placed in an inclined position, so that as the needle-heel passes down the cam it has no corners nor separate cams to strike, but slides smoothly, creating no jar. The needle-heels should project high enough above the needle-bed to fairly and smoothly strike both the face-plate and stitch cam or lengthener. The stitch-lengtheners slide in a direction parallel to the cam-edge of the face-plate, so that, as they are lowered to lengthen the stitch, they form a continuation of said cam-edge parallel to the working-face of the cam D that elevates the needles. The stitch-lengtheners are moved up and down and fastened at any point by means of set-screws *p p*, passing through inclined slots in the side of the carriage. The gathering-cam *k* above mentioned is only a separated part of the cam D that elevates the needles, or, perhaps more properly, a part of the car-

riage, so constructed and arranged that its upper edge will fit the lower side of the needle-cam when it is moved down for the purpose of elevating the needles. It is a little thinner than the needle-cam, so as to admit the needle-elevators under it, and is designed to gather the needles up to the cam D, when the stitch-lengtheners have been lowered, so as to make a very long stitch, or so far that the heels of the needles would be drawn below the lower edge of the cam D.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The wheel C, provided on the under side with a cam-groove, *e*, and on the upper side with cross-arms *h h*, in combination with the cam D and latches E E, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of April, 1872.

JONATHAN LEONARD.

Witnesses:

F. H. STEIGMEYER,
C. SHEELEY.