J. HEGINBOTHOM.

NEEDLE-BARS AND CYLINDERS OF KNITTING-MACHINES.

No. 182,822. Patented Oct. 3, 1876.

Fig. 1.

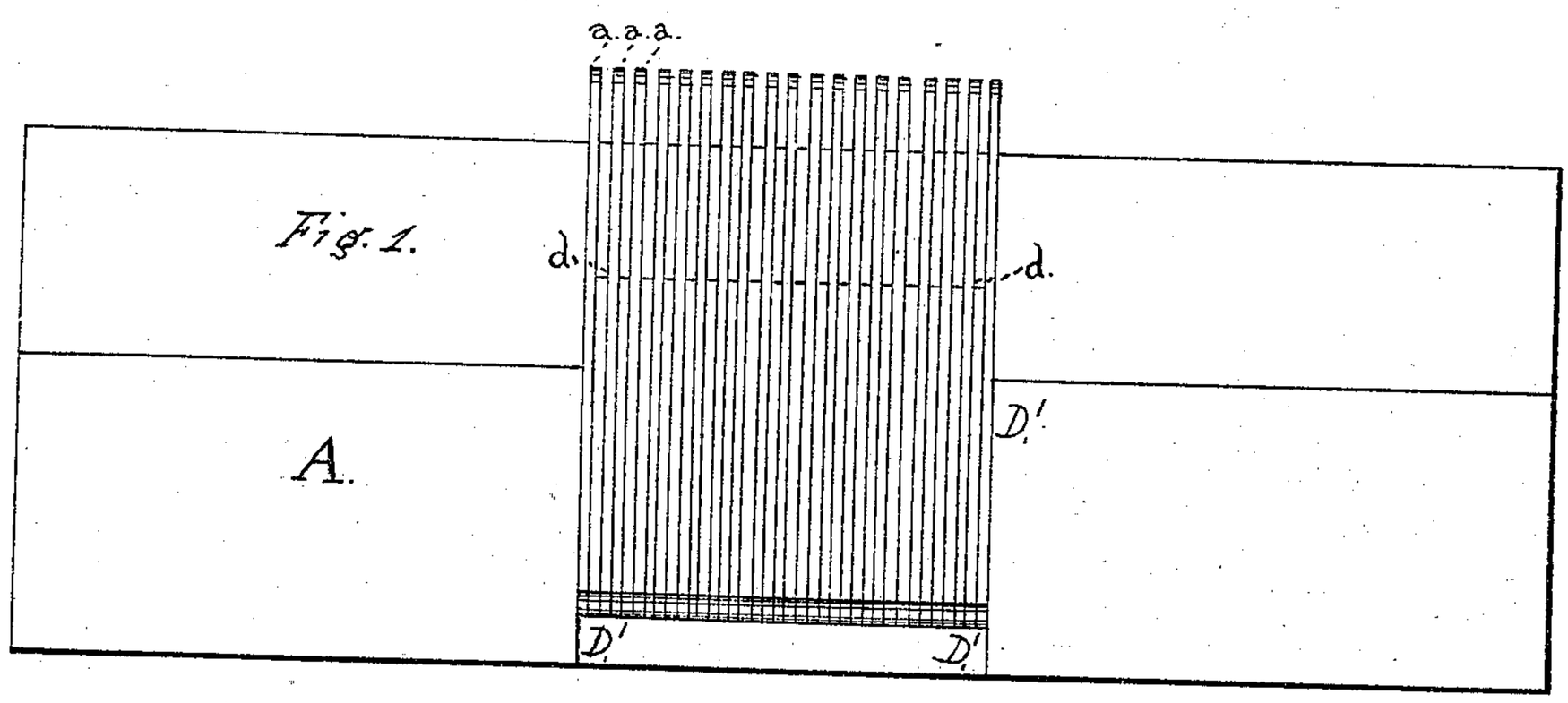


Fig. 2.

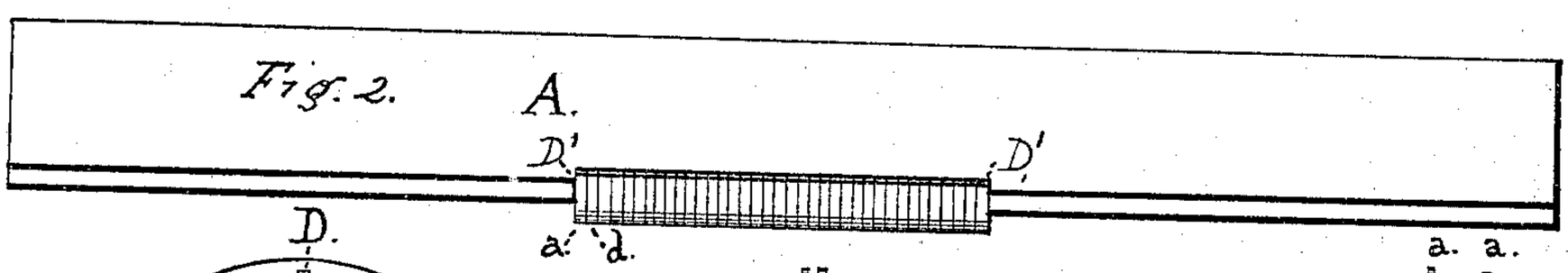


Fig. 3.

Fig. 5.

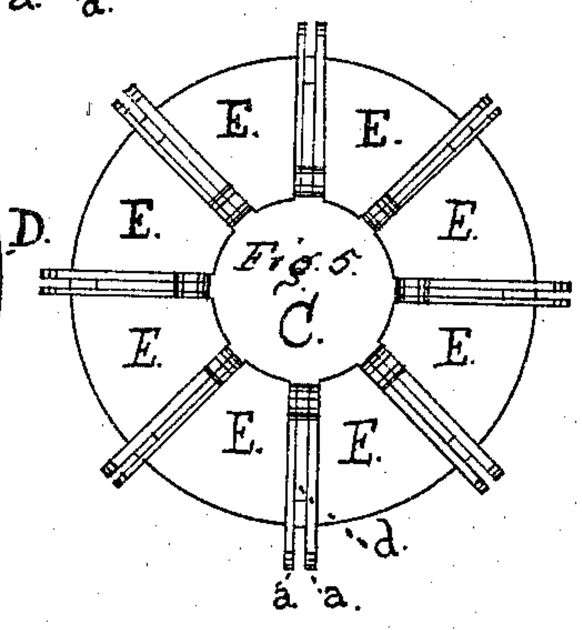


Fig. 7.

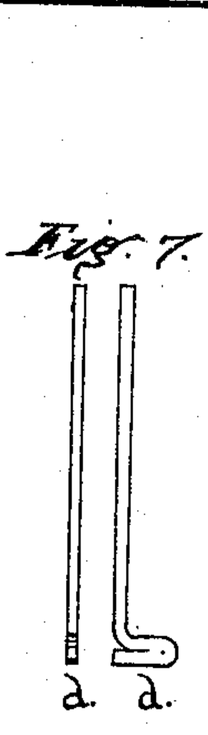


Fig. 8.

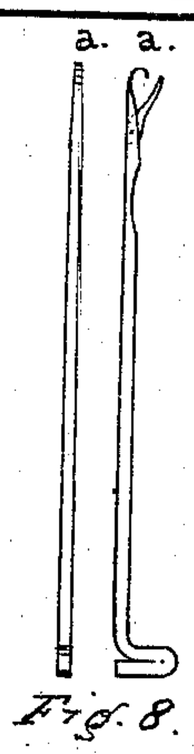


Fig. 4.

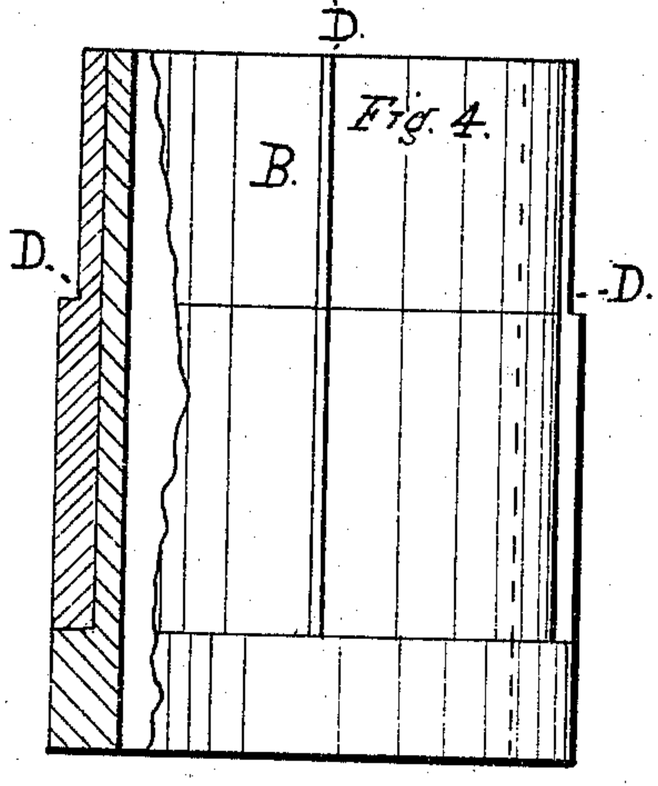
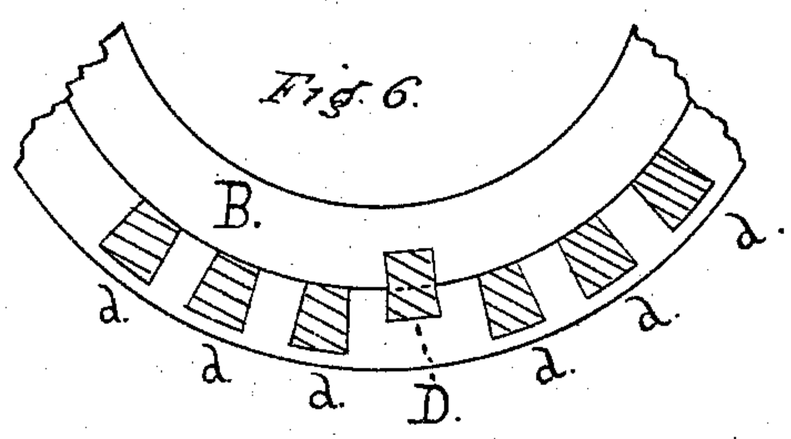


Fig. 6.



Witnesses.
W. F. Marcus.
H. C. Jane

Inventor.
Joseph. Heginbothom,
by his Attorney
John Shinn.

UNITED STATES PATENT OFFICE.

JOSEPH HEGINBOTHOM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN NEEDLE-BARS AND CYLINDERS OF KNITTING-MACHINES.

Specification forming part of Letters Patent No. **182,822**, dated October 3, 1876; application filed May 29, 1876.

To all whom it may concern:

Be it known that I, JOSEPH HEGINBOTHOM, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Knitting-Machines, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to dispense with channeling or grooving the needle-bars and cylinders of knitting-machines. Channels were heretofore cut into the solid metal, forming a fixed division between each two needles.

My improvement enables me to work a greater number of needles in a given space, by which I am enabled to make finer work, and by adjusting the needles I am enabled to make different grades of work on the same bars or heads. The friction on the sides of the needles is with my improvement almost entirely dispensed with, and the cost of construction is greatly reduced.

The invention consists, first, in using one or more sliding pieces of sheet steel or flattened steel wire, having a butt corresponding with the butt on the needles, and made to slide with and between the needles, they forming the gage or pitch, at the same time securing the needles in position, each forming a support for the other the whole distance in a continuous line, moving along the cam together with the needles, thus decreasing the friction of the needles as heretofore operated, in a groove or channel, with fixed divisions between each needle.

The second part of my invention consists in constructing the cylinders and bars with two or more fixed supports or stops in a straight or circular line of needles to prevent them from being forced out of their position by the traveling cams, which slide the needles and dividing-pieces, as will be hereafter described.

Figure 1 is a plan of a needle-bar; Fig. 2, an edge view of the same. Fig. 3 is a plan of a cylinder-head. Fig. 4 is a side view of the same, part of which is in section. Fig. 5 is a plan of a circular dial. Fig. 6 is an enlarged section of a cylinder-head, sliding bits, showing a section of one of the fixed stops. Fig. 7 gives a front and also a side view of one of the sliding bits. Fig. 8 gives a front and also a side view of one of the sliding needles.

Similar letters in the drawings refer to like parts.

A is the needle-bar, and may be made of iron, brass, or steel. A recess in the bar is planed or milled out for the width that the whole number of needles will occupy, forming shoulders D′ D′ at each end of the row of needles, and against which they slide when operated by the cams. In place of milling or planing out the bar A to form the shoulders D′ D′, they may be formed by riveting or screwing to the bar A pieces forming the shoulders D′ D′. The needle-bar is provided with a cap, as usual, to hold the needles in their proper sliding position, and they are operated by the usual cam-bar. *a a* represent the sliding needles, called the "sliding latch needles," provided with butts. (See Fig. 8.) *d d* are the sliding bits, and are made of steel, and provided with butts like those on the needles. (See Fig. 7.) B represents a cylinder-head, which can be made of iron, brass, or steel. This cylinder-head is made in the usual manner, except that it is not channeled for the needles.

The drawing, Fig. 3, shows four fixed projections, D D D D. These projections should be made made of steel, hardened and fastened in the cylinder by a dovetail joint. (See the enlarged section, Fig. 6.) These projections prevent the needles from being forced around the cylinder by the cam that operates the needles, and the needles will be kept in position, and work parallel to the fixed projections. Any number of the projections may be used, as required, according to the size of the cylinder.

C, Fig. 5, is a needle dial-plate, and is made of the usual material. The dial-plate C is channeled out to receive in each channel two or more needles. The sides of the channels are parallel. Between the channels are projecting pieces E E, upon which rests the revolving disk, to which is fixed the cam that slides the needles and bits in the channels. The needles are properly spaced or divided by

placing between them one or more of the sliding bits *d*, which are operated by the same cam that operates the needles in the dial.

In placing the needles around a small circular head it may be necessary to make the bits beveled on their sides, so that they will fill up the space between each two needles. The form of the beveled bits is plainly shown in section in the enlarged view, Fig. 6.

In using my improvement in connection with a needle-bar, where the needles are arranged in a straight line, the sliding bits *d d* are straight, and in many cases needles that have the hook or latch broken off can be cut the proper length and used for sliding bits, all of which will be readily understood by one skilled in knitting machinery.

Having thus described my invention, I claim—

1. In combination with the needle-bar, cylinder, or dial of a knitting-machine, provided with knitting-needles, the independent and movable bits *d d* arranged between the said needles, as and for the purpose set forth.

2. In combination with a knitting-machine needle-bar, cylinder, or dial, provided with stops or projecting pieces and knitting-needles, the independent and movable bits *d d*, arranged between the said needles, as and for the purpose set forth.

JOSEPH HEGINBOTHOM.

Witnesses:

JOSEPH TAYLOR,

JAMES E. KERSLEY.