

(No Model.)

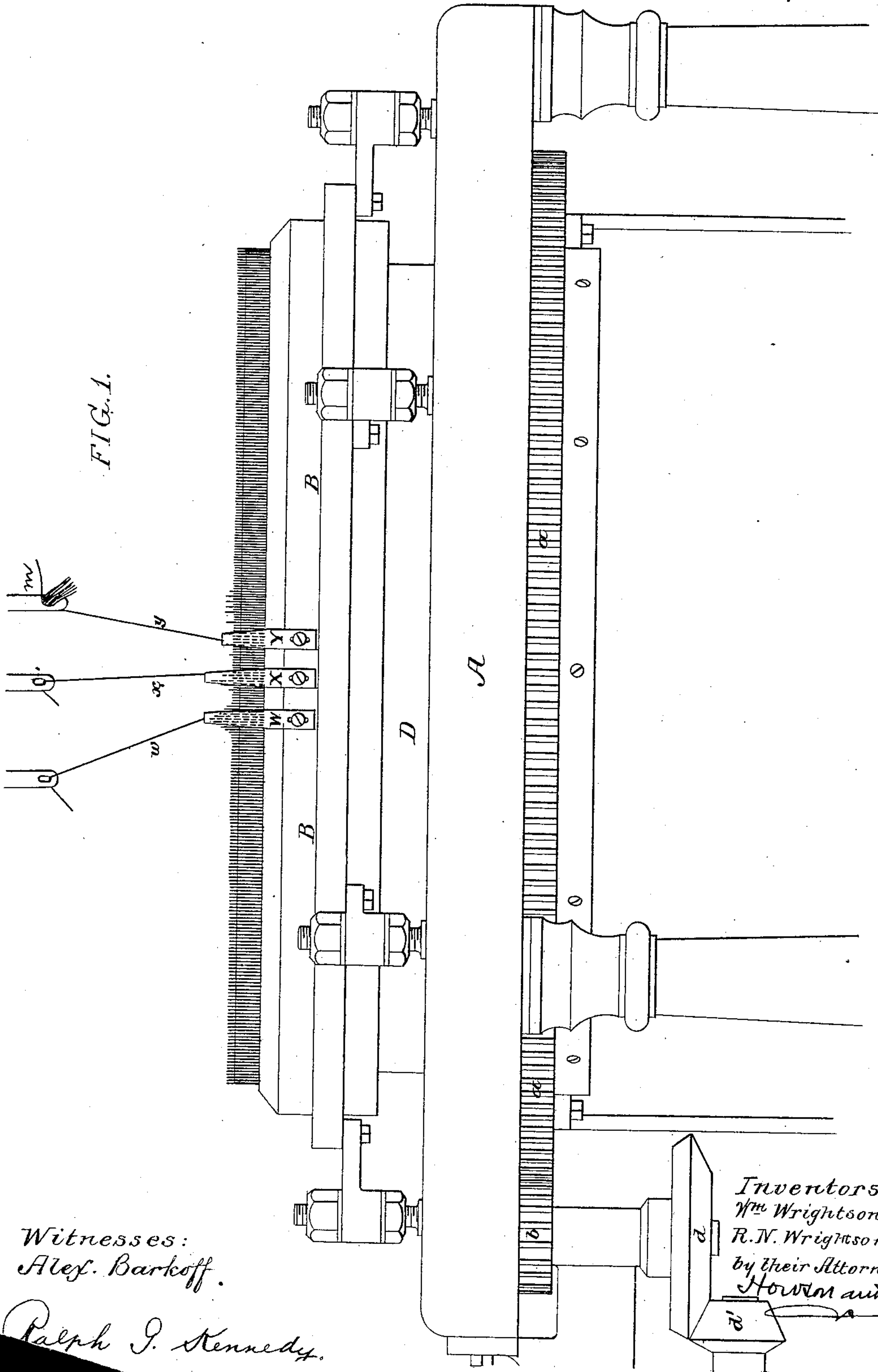
W. & R. N. WRIGHTSON.

2 Sheets—Sheet 1.

KNITTING MACHINE.

No. 353,525.

Patented Nov. 30, 1886.



Witnesses:
Alex. Barkoff.

Ralph J. Kennedy.

Inventors
Wm Wrightson &
R. N. Wrightson
by their Attorneys:
Howell and Co.

(No Model.)

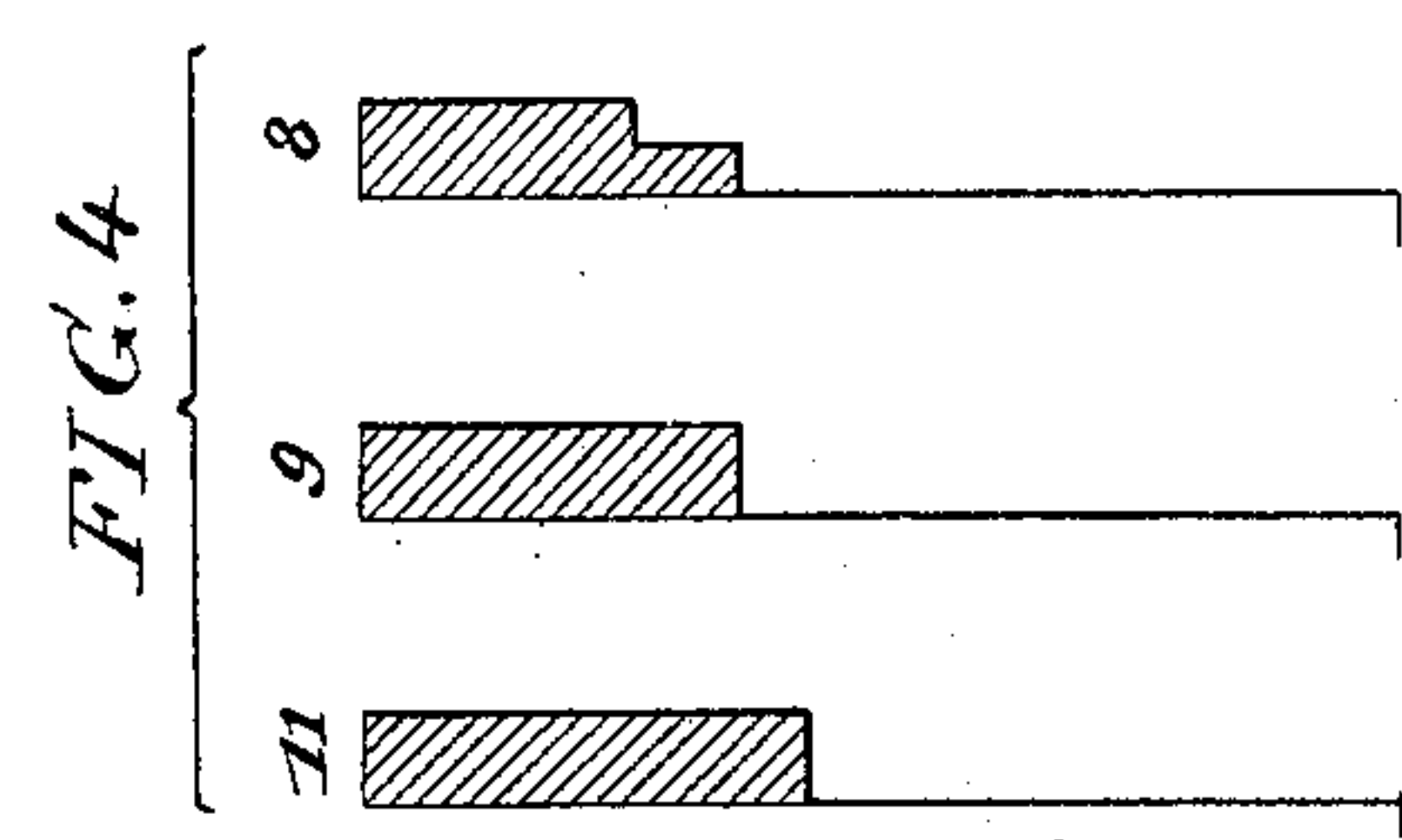
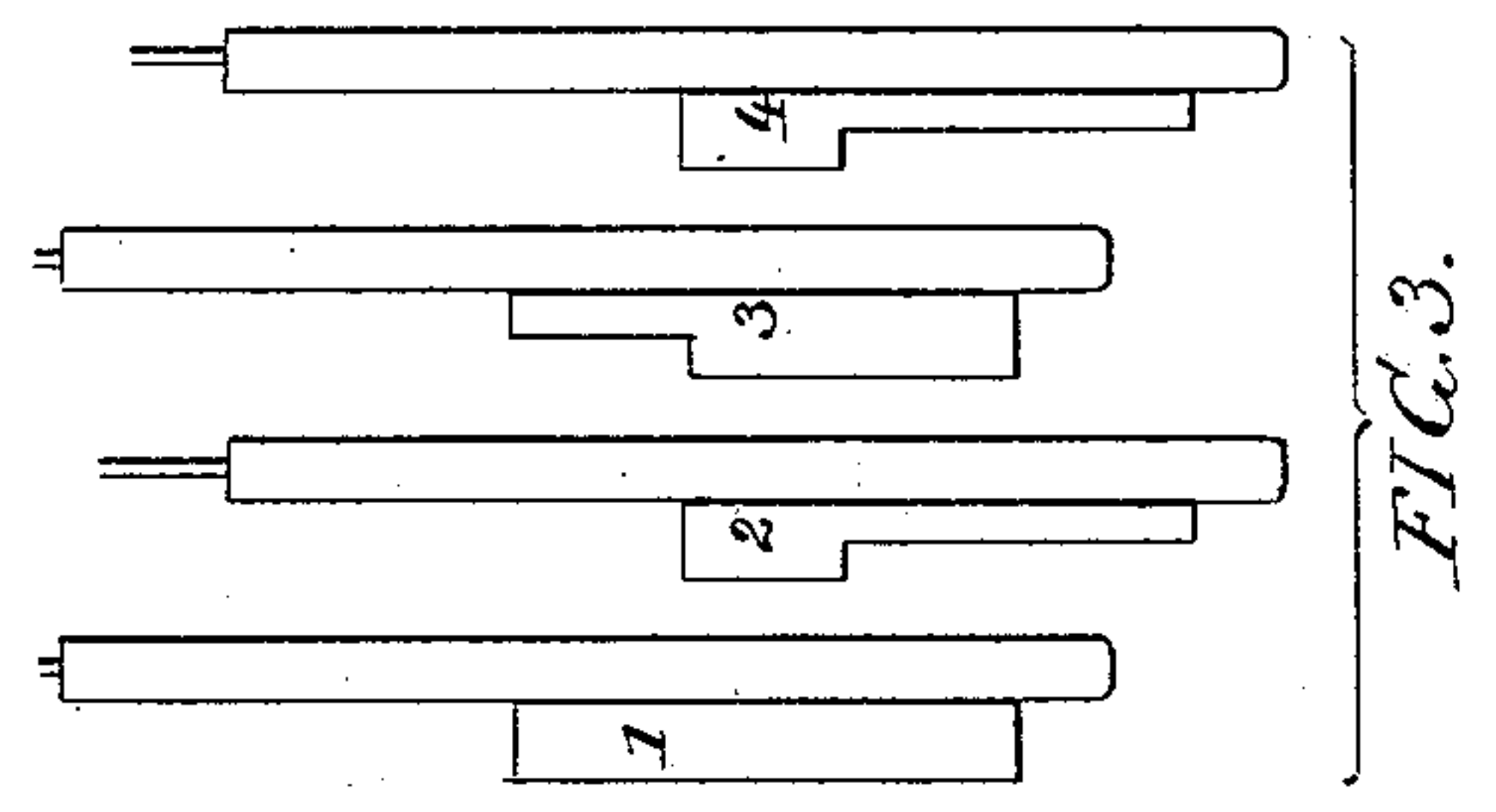
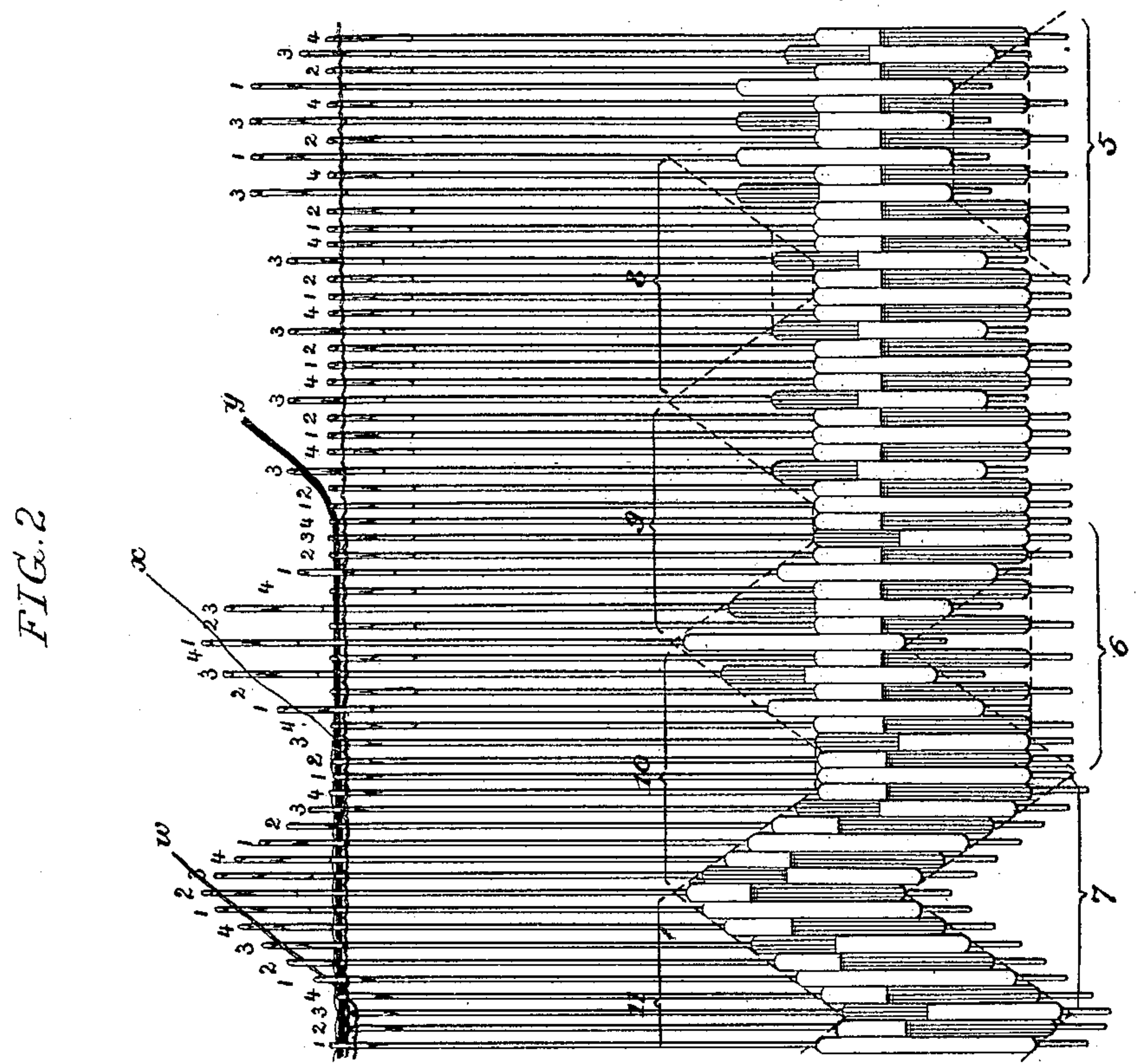
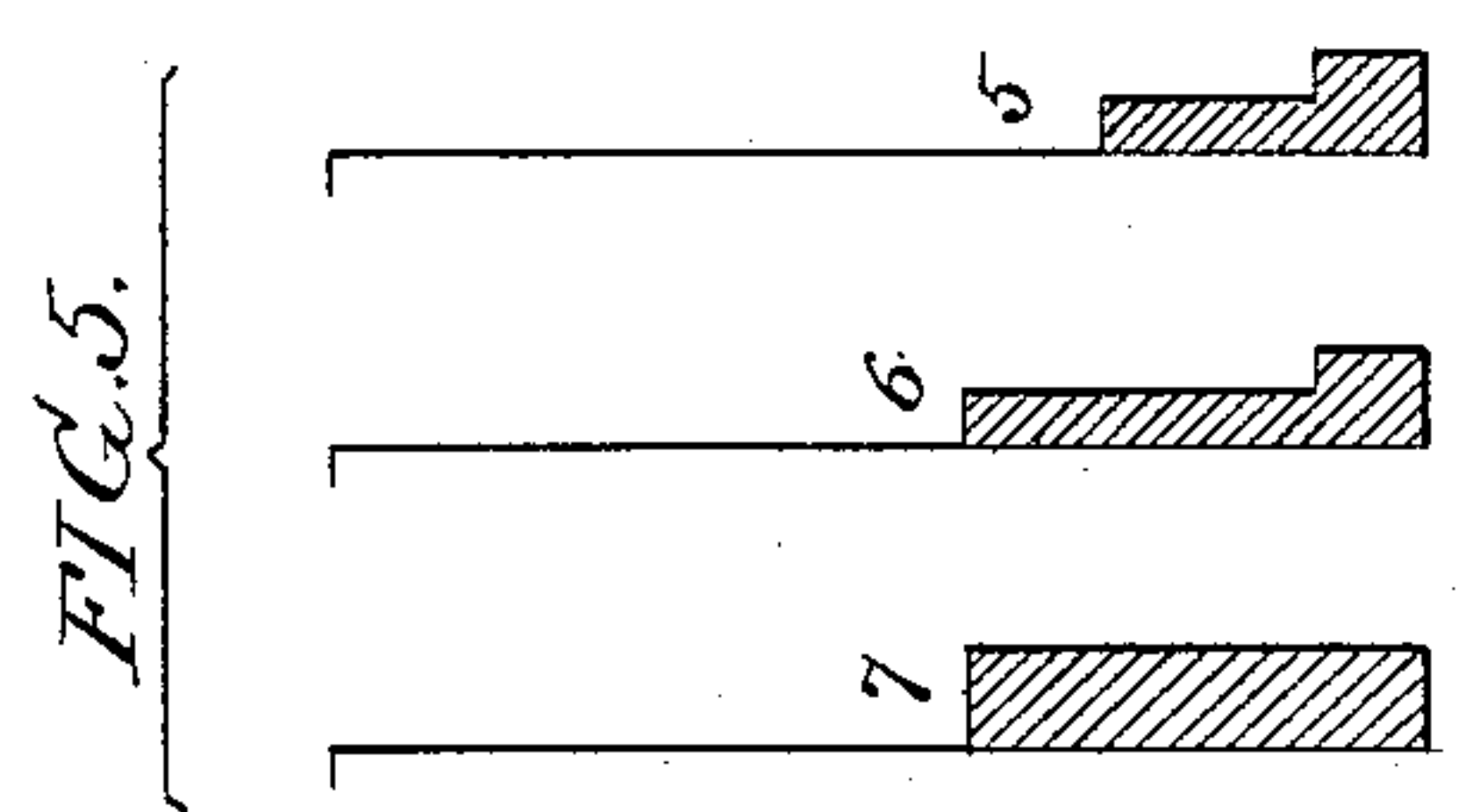
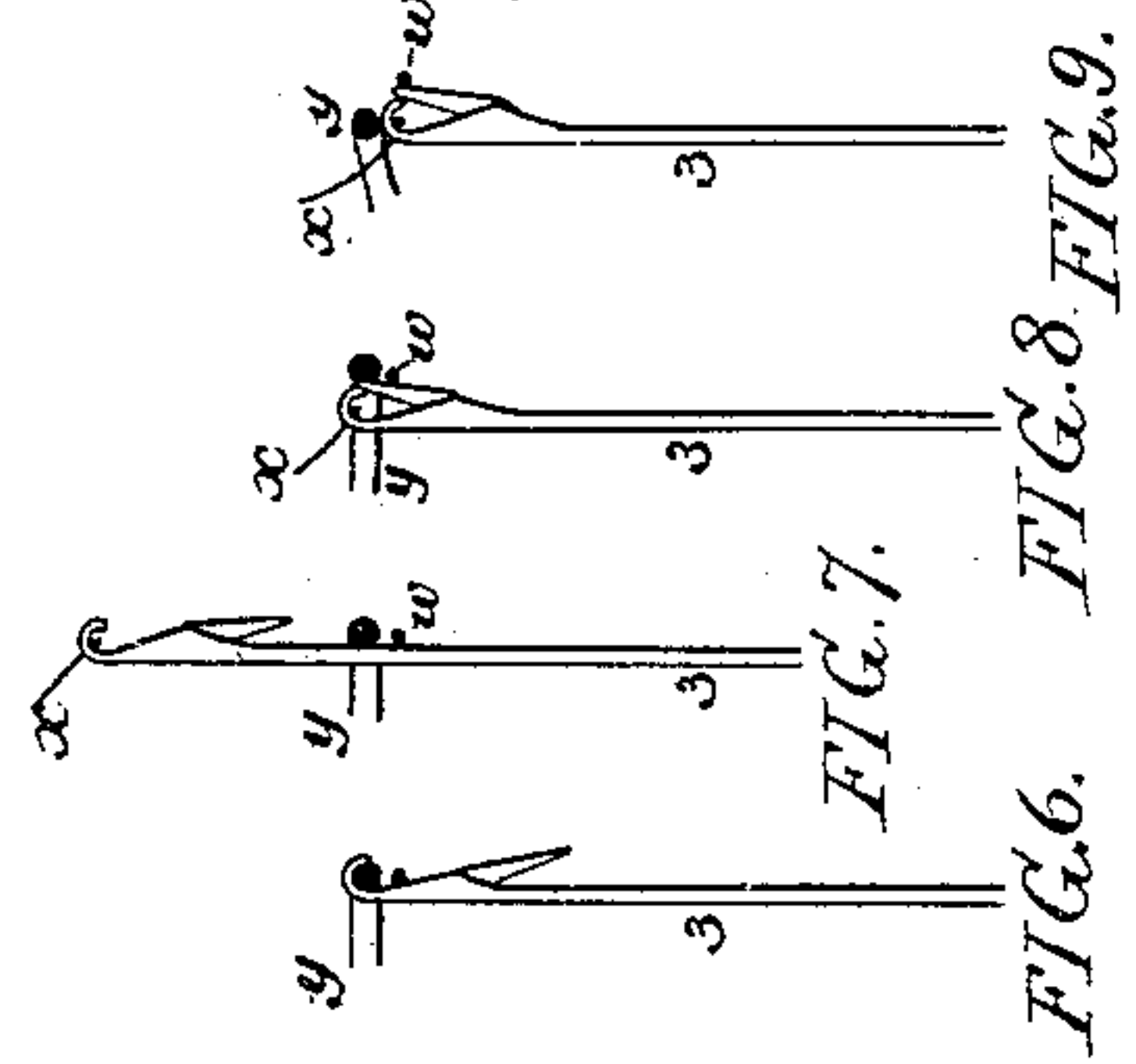
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by their Attorneys:
Howson and Sons

UNITED STATES PATENT OFFICE.

WILLIAM WRIGHTSON AND ROBERT N. WRIGHTSON, OF LINWOOD, PA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,525, dated November 30, 1886.

Application filed August 18, 1885. Serial No. 174,682. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM WRIGHTSON and ROBERT N. WRIGHTSON, citizens of the United States, and residents of Linwood, Delaware county, Pennsylvania, have invented certain Improvements in Knitting-Machines, of which the following is a specification.

The object of our invention is to so construct a latch-needle knitting-machine as to produce thereon a fabric resembling the well-known stockinet fabric, having a knitted face and a backing composed of threads tied into said face by a third or binding thread.

In the accompanying drawings, Figure 1 is a side view of sufficient of a knitting-machine to illustrate our invention; Fig. 2, a sectional diagram, on a larger scale, of a portion of the machine; Fig. 3, a view showing the different needle-bits; Figs. 4 and 5, views showing the different cams; and Figs. 6, 7, 8, and 9, diagrams illustrating one of the features of the invention.

The machine which we use in carrying out our invention may be similar to an ordinary balmoral frame, such as shown in Fig. 1, A being the fixed frame of the machine, B the cam-box mounted thereon, and D the needle-cylinder driven by spur-gears *a* and *b* and bevel-gears *d* and *d'* from the driving-shaft, as usual.

The threads fed to the machine are arranged in sets, each set comprising one or more knitting-threads, *w*, a binding-thread, *x*, and a backing-thread, *y*, these threads being adapted to their respective guides W, X, and Y, as shown in Fig. 1, in which one set of threads and guides is illustrated, although it should be understood that in practice the sets are duplicated to any extent which the capacity of the cylinder will permit.

In producing the fabric on this machine certain of the needles are first raised to such an extent that their loops are now slipped back of the latches. Certain of these raised needles are then depressed, and the backing-thread is fed to the hooks of the needles remaining elevated. These raised needles are then, by preference, depressed, so as to draw the backing-thread into their hooks, and all of the needles that were first raised are then again raised to receive the binding-thread, this second rise being to a greater extent than

the first, so that the loops on the needles and the backing-thread carried by some of the needles will be slipped back of the latches. The needles are then depressed, so as to draw the binding thread into their hooks, the extent of this depression being such as to cause the discharge of the backing-thread, but not sufficient to slip the fabric loop. All of the needles are then raised to receive the knitting-thread and slip the old loops and the loops of the binding-thread back of the latches, after which the needles are depressed, so as to cast their loops and form loops of the new knitting-thread.

As shown in Fig. 2, there are a succession of needles, 1, 2, 3, and 4, the needles 1 and 3 being first raised and the needles 2 and 4 allowed to remain down, and the needles 1 being then depressed, so as to leave only the needles 3 elevated for the reception of the backing-thread, these needles being then depressed, so as to draw the thread into their hooks, said thread being laid behind the intervening needles, 4, 1, and 2. The needles 1 and 3 are then again raised, so as to receive the binding-thread, and are then depressed, so that the backing-thread will be cast off the needles 3, as before set forth, all of the needles being then raised to receive the knitting-thread. This operation of the needles we effect by the use of what are known as upper and lower tuck-cams and upper and lower tuck-bits on the needles. The needles 1 have full bits, the needles 2 and 4 lower tuck-bits—*i. e.*, bits cut away at the bottom—and the needle 3 an upper tuck-bit—*i. e.*, a bit cut away at the top.

The lower cams 5 and 6 are tuck-cams—*i. e.*, they are recessed—so that while they will elevate to the full extent all the needles having full bits or upper tuck-bits subjected to their action, they will only partially lift the needles having recessed lower tuck-bits.

The upper cam 8 is a tuck-cam, which, while it depresses the needles having full bits or lower tuck-bits, will fail to depress or will only partially depress the needles having upper tuck-bits.

The lower cam 7 and the upper cams 9, 10, and 11 are full cams, which act upon all of the needles to the same extent.

The lower tuck-cam 5 has its point reduced, so that it will not elevate any of the needles subjected to its action to such an extent as to

cause them to slip their loops back of the latches, and the upper cams 8, 9, and 10 are likewise reduced, so that they will not depress the needles to the point of casting the knitting-loop or drawing a stitch, the cam 11 being the only one which effects this result. By using a full-pointed cam in place of the reduced cam 10, however, the loops of face fabric carried by the needles 1 and 3 may be cast off and fresh loops formed thereon by the binding-thread.

It will be observed that every fourth needle receives the backing-thread, every alternate needle receives the binding-thread, and every needle receives the knitting-thread.

In the absence of the arrangement of upper and lower tuck-cams, as described, three different lifting cams and three different styles of bits on the needles would be required, so that each cam would operate only upon its special needles.

The use of lower tuck-cams 5 and 6 and the employment of an upper tuck-cam to depress certain of the needles raised by the first lower tuck-cam, 5, enables us to dispense with a specially-constructed lower cam and needle bits for the purpose of raising every fourth needle to receive the backing-thread.

The casting of the backing-thread from the needle without casting the loop of face fabric is facilitated by imparting a slight tension to the backing-thread, which may be effected by partially obstructing the guide-eye *m*, through which said thread passes before reaching the guide *Y*, or in any other of the numerous ways which will suggest themselves to those familiar with this class of machinery. The guide-eye can be obstructed by drawing a tuft of fibers or strands into the same, as shown in Fig. 1.

Knitted fabric can be produced on our improved machine much more rapidly than upon the spring-beard-needle machine now employed for the production of stockinet fabric.

The fabric produced on our machine differs from the usual stockinet fabric, for while

the binding-thread is interlocked with loops of the face fabric the successive courses of binding-thread are not interlooped with each other, the binding-thread, moreover, engaging with the loops of but a single course of the face fabric, instead of with the loops of two courses, as in the usual stockinet fabric, so that less binding-thread than usual is used and less appears upon the face of the fabric, as fully set forth in an application which we have filed simultaneously herewith, the serial number of which application is 174,681.

We claim as our invention—

1. The combination of guides for backing, binding, and knitting threads, the needle-cylinder and latch-needles guided therein, and having upper tuck, lower tuck, and plain bits, as described, with upper tuck-cam 8, upper plain cams 10 and 11, lower tuck-cams 5 and 6, and lower plain cam 7, all substantially as specified.

2. The combination of guides for backing, binding, and knitting threads, the needle-cylinder and latch-needles guided therein, and having upper tuck, lower tuck, and plain bits, as described, with the upper tuck-cam 8, upper plain cams 9, 10, and 11, lower tuck-cams 5 and 6, and lower plain cam 7, all substantially as specified.

3. The combination of guides for the backing, binding, and knitting threads, means for imparting tension to said backing-thread, the cylinder and latch-needles guided therein, and having upper tuck, lower tuck, and plain bits, as described, with the upper tuck-cam 8, upper plain cams 10 and 11, lower tuck-cams 5 and 6, and lower plain cam 7, all substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM WRIGHTSON.
ROBT. N. WRIGHTSON.

Witnesses:

WILLIAM F. DAVIS,
HARRY SMITH.