(No Model.) 2 Sheets—Sheet 1.

A. REICHERT.

KNITTING MACHINE.

No. 358,881. Patented Mar. 8, 1887.

Fig. 1.

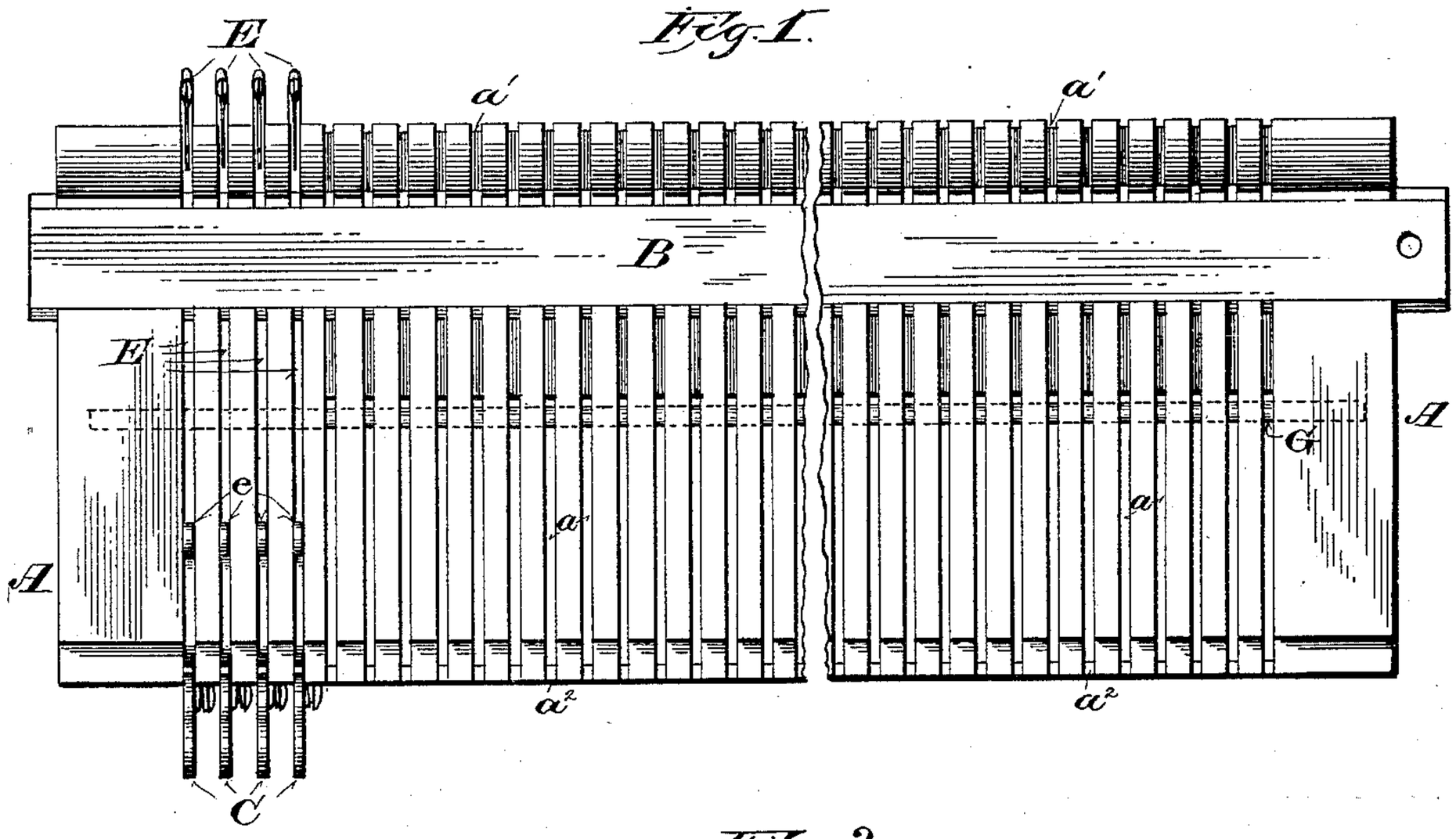

Fig. 2.

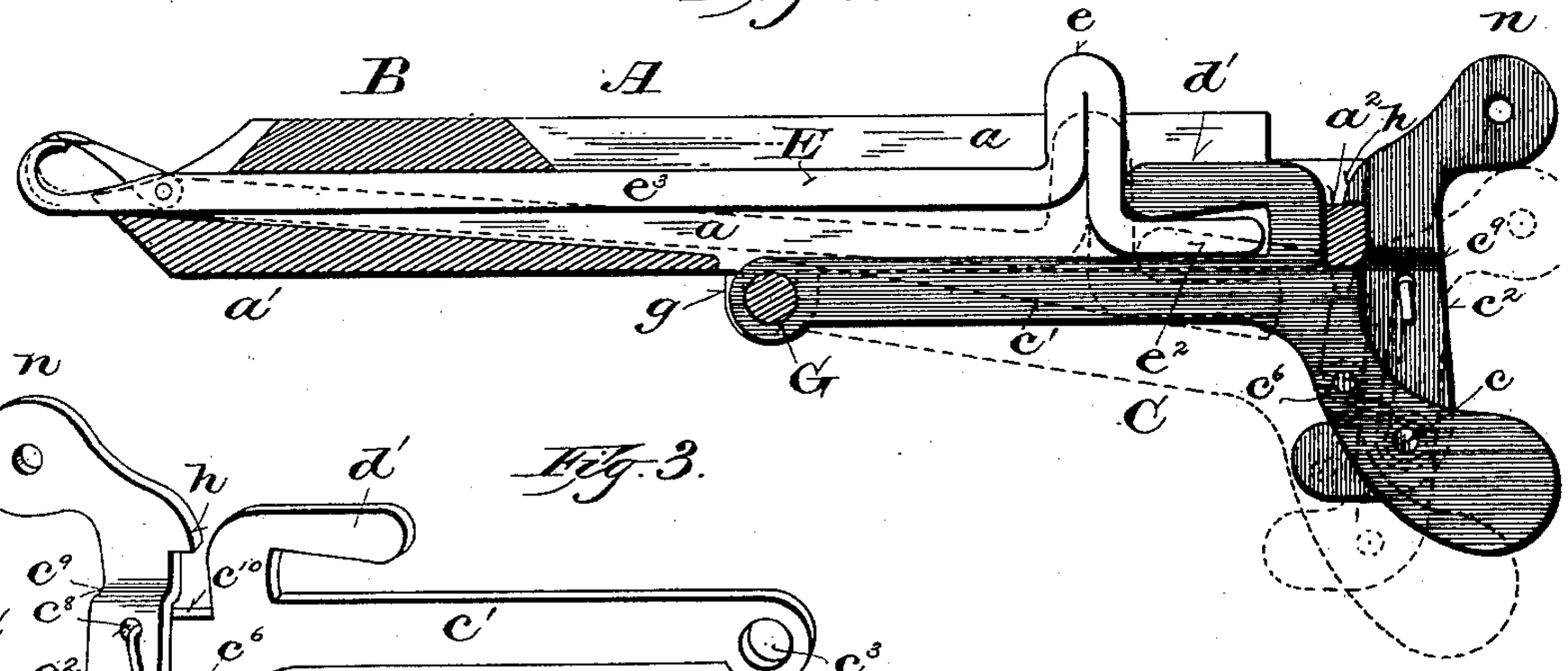

Fig. 3.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

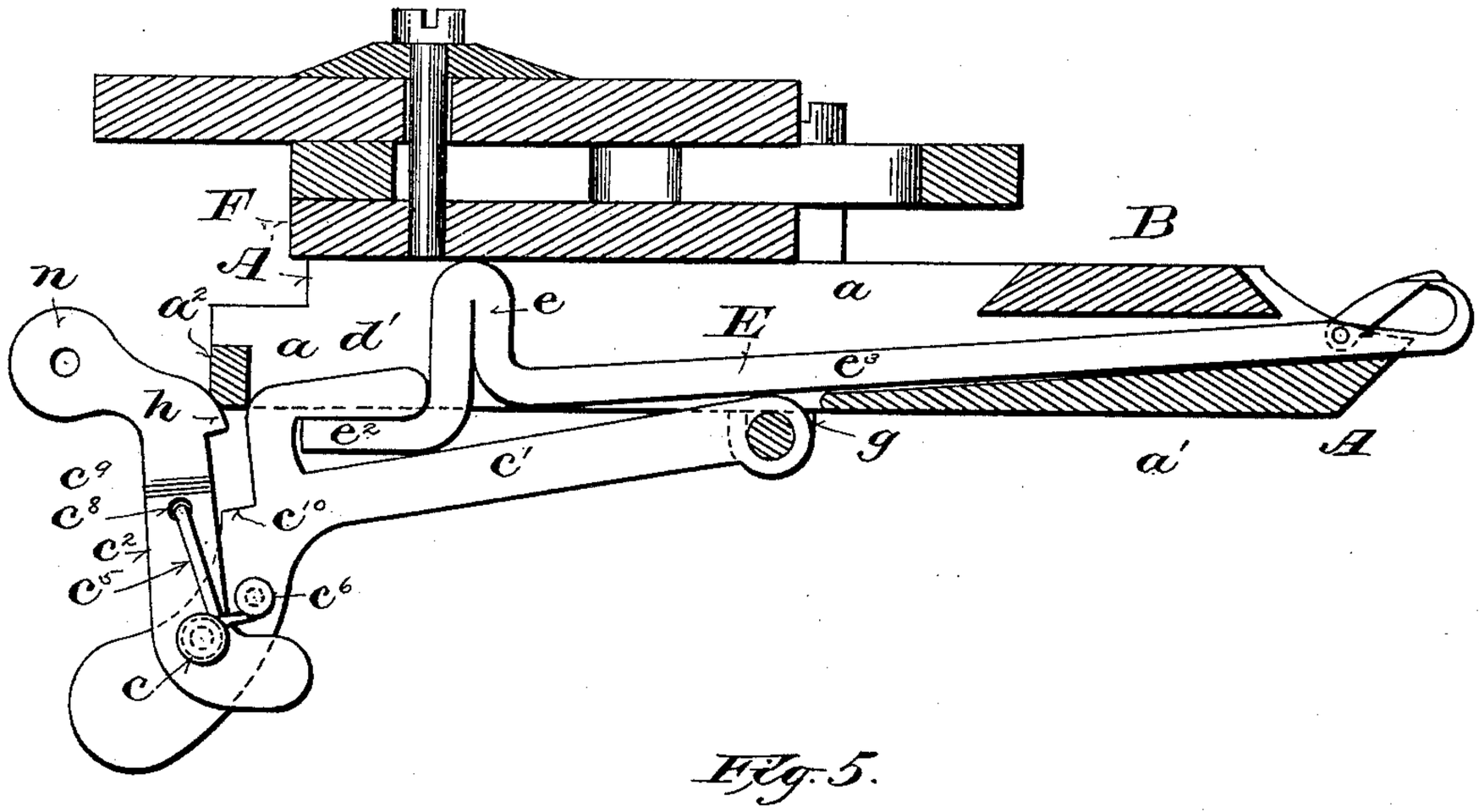
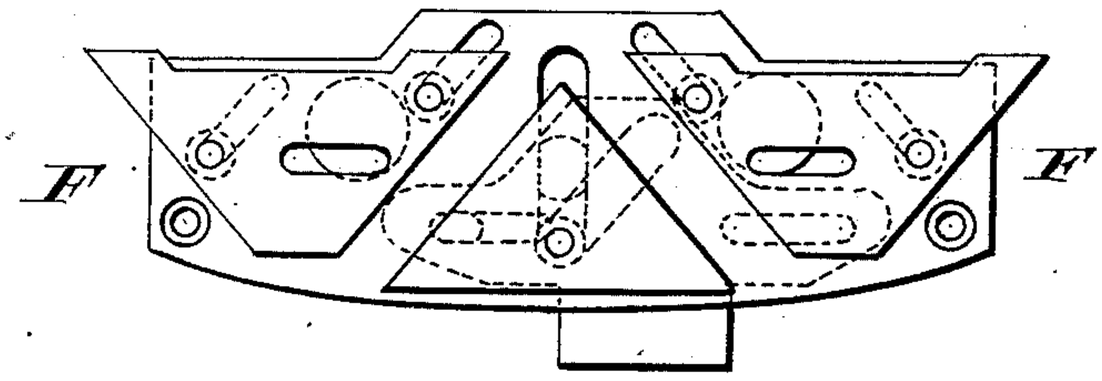


Fig. 5.



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UNITED STATES PATENT OFFICE.

AUGUST REICHERT, OF MILWAUKEE, WISCONSIN.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 358,881, dated March 8, 1887.

Application filed July 26, 1886. Serial No. 209,158. (No model.)

To all whom it may concern:

Be it known that I, AUGUST REICHERT, a citizen of the United States, residing at the city of Milwaukee, in the county of Milwaukee, in the State of Wisconsin, have invented new and useful Improvements in Knitting-Machines; and I hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates particularly to the so-called "straight-frame machines," such as the well-known "Lamb knitting-machine," for which United States Letters Patent were granted September 15, 1863, and October 10, 1865; and it consists, essentially, of certain peculiarities of construction, hereinafter described, in the needle, needle-plates, and needle-shifters.

Its objects are, first, to positively hold any number of the needles, when not in active use, out of engagement with the needle-cams; second, to strengthen the needle-plates, and, third, to prevent the oscillation or lateral movement of the needles in the grooves in which they work.

In the accompanying drawings like letters designate similar parts in the several figures.

Figure 1 is a plan view of one of the needle-plates. Fig. 2 is a transverse vertical section of the same on an enlarged scale, showing a needle-shifter and a needle in working position. Fig. 3 is a perspective view of a needle-shifter detached from the machine. Fig. 4 is a transverse vertical section of one of the needle-plates and needle-shifters, and a needle out of working position, with the adjacent needle-cam and the parts therewith associated; and Fig. 5 is a plan view of the under side of one of the operating-cams.

The general construction of the frame of the machine, the carriage, needle-cams, and other parts not specifically described being the same as those in machines already in use and well understood, it is not necessary to illustrate or describe them in detail, it being understood, of course, that two needle-plates are employed, arranged in the usual way, with their inner edges horizontal and parallel and inclined downwardly therefrom toward their outer edges, the hooks of the needles adjacent to each other, and two operating-cams connected on each side of the machine with a reciprocating carriage.

A represents one of the needle-plates provided with a series of equidistant parallel slots or grooves, *a a*, which extend from side to side and through the middle portion of the plate, leaving only the continuous connecting portions a' a^2 lengthwise of the machine, the portion a' extending from the inner edge of said plate nearly to its longitudinal center.

B is one of the retaining-slides, inserted in the usual manner in a longitudinal dovetailed groove formed in the upper face of the needle-plate, near its inner edge, over the inner ends of the needle, which are thereby held in place.

E E are the needles, provided near their outer ends with the upwardly-projecting heels *e e*, which are engaged by the needle-operating cams F when the needles are in their working position, and are continued at their outer ends beyond said heels into feet e^2 e^2, which are engaged by the needle-shifters C C, hereinafter described.

The needles E E are generally of the same form and construction as those employed in the Lamb machine, except that the transverse portions thereof are longer, affording a greater vertical bearing against the sides of the slots *a a* in which they work, and thereby holding said needles more firmly and preventing their oscillation or lateral movement in said grooves *a a* when engaged by the operating-cams F.

The feet e^2 e^2, instead of being formed in a line with the main parts e^3 of the needles, extend outwardly considerably below but parallel or nearly parallel with the parts e^3, so that when in working position the needles bear only at their inner ends upon the inner and upper edge of the continuous part a' of the needle-plate, and at their outer ends through their feet e^2 e^2 upon the upper faces of the sections c' c' of the needle-shifters, which, when the needles are in working position, as stated, are parallel with their line of movement and with the parts e^3 and feet e^2, as shown in Fig. 2.

C C are the needle-shifters, each of which is composed of two sections, c' c^2, pivoted to each other at *c*. The several sections c' are

formed at their inner ends with eyes c^3, by means of which they are hinged upon the rod G, secured at its ends lengthwise of the machine to the under side of the needle-plate A by ears *g* depending therefrom. Each section *c'* is provided near its outer end with the forwardly-extending downwardly-inclined projection *d'*, the shoulder c^{10}, and the stud c^6. The other section, c^2, is pivoted near its lower end, by means of the pin *c*, to a downwardly-inclined projection from the outer end of section *c'*, and, extending therefrom in an upright position, is provided at or near its upper end with the shoulder *h*, which overhangs the shoulder c^{10} on section *c'*, and with the outwardly-projecting thumb-piece or ear *n*, by means of which the needle-shifter C is operated. The section c^2 is bent at c^9, so that the portion above that point will be in the same vertical plane with the needle E and section *c'* of the needle-shifter C, and will permit the shoulder *h* to enter the same groove *a* and engage the upper face of the continuous portion a^2 of the needle-plate A when the needle is lifted into its working position.

c^5 is a wire spring secured at one end to the stud c^6 of section *c'*, thence carried over and around the pivotal pin *c*, and thence up to and secured in the eye c^8, formed in section c^2, as seen in Figs. 2, 3, and 4.

It will be seen upon reference to Figs. 2 and 4 of the drawings that the needle-shifters C are considerably shorter than those heretofore employed in this class of machines, and being hinged to the under side of the needle-plate, near its longitudinal center, the continuous portion *a'* of said plate is widened and the needle-plate correspondingly strengthened.

My improved machine operates as follows: Whenever it is desired to withdraw any number of the needles out of action, it is done by pressing section c^2 of the shifter back by means of ear *n*, thus releasing the shoulder *h* from engagement with the continuous part a^2 at the outer edge of needle-plate A, and permitting the needle-shifter to swing down upon the rod G until the heel *e* of the needle E is carried below the upper face of the needle-plate out of engagement with the needle-cam, the main part e^3 of the needle resting upon the upper face of the continuous portion *a'* of the needle-plate and the inner end of the shifter C and its foot e^2 upon the section *c'* of said shifter and underneath the projection *d'*, as shown in Fig. 4. When the shifter C is thus depressed, the spring c^5 forces the shoulder *h* on section c^2 under the outer portion, a^2, of the needle-plate, thereby securing said shifter in its lower position, as seen in Fig. 4, and preventing heel *e* of the needle from being lifted into engagement with the needle-cam.

As heretofore constructed, the needle E, when depressed by the shifter out of working position, would still be free to be advanced toward the center of the machine, and would be liable to be so advanced by the jar of the carriage and actuating-cams until their heels would be brought sufficiently above the surface of the needle-plates to be engaged and broken by said cams. It will be seen, however, that in my improved device this difficulty is entirely obviated in the following manner: The needle-shifter C, being much shorter than the needle E, has a greater angular movement when it is depressed, and when carried into its lower position is inclined from the rod G toward its outer end downwardly from said needle, as seen in Fig. 4. The foot e^2, assuming the position shown in Fig. 4, inclined to the upper face of section *c'* of the shifter and in contact with the lower face of projection *d'*, is securely held thereby, and the needle is prevented from being advanced by the jar of the machine, the movement of the cams in operating the other needles, or otherwise, into its working position. The needle is readily carried back into its working position whenever desired by pressing section c^2 of the shifter back, thus disengaging the shoulder *h* from the outer portion, a^2, of the needle-plate and raising the shifter till the shoulder c^{10} strikes the needle-plate, when the shoulder *h* will be forced by spring c^5 over said portion a^2 of the needle-plate, thereby locking the shifter in that position, as seen in Fig. 2. The section *c'* of the shifter is thus brought parallel with the main portion e^3 and the foot e^2 of the needle, which, supported by said shifter in its working position, is thereby released to be operated by the actuating-cam.

My improvements will be found useful when it is desired to retain the stitches upon a part of the needles out of action to be taken up at some future stage of the work.

I claim—

1. The combination, in a knitting-machine, of a transversely-slotted needle-plate, a needle having a transverse bend and a terminal foot below the body or main portion thereof, a needle-shifter which has an overhanging projection inclined thereto and is hinged to the needle-plate between the inner hooked end of the needle and its transverse bend, and a spring-catch arranged to engage the outer edge of the needle-plate and hold the needle in its working position, substantially as and for the purposes set forth.

2. The combination, in a knitting-machine, of the needle-plate A, having transverse slots *a*, and needle E, arranged to work therein, and provided with the foot e^2, with the needle-shifter C, provided with the projection *d'*, inclined thereto and arranged to positively retain said needle out of action, substantially as and for the purposes set forth.

3. The combination, in a knitting-machine, of the needle-plate A, having slots *a*, needle E, having foot e^2, the needle-shifter C, composed of the sections *c'* and c^2, and the spring c^5, substantially as and for the purposes set forth.

4. The combination, in a knitting-machine,

of the needle-plate A, having the slots *a*, a needle, E, having the foot e^2, the shifter C, hinged to the under side of said needle-plate near its longitudinal center and provided with the overhanging projection *d'*, inclined toward the upper face of said shifter, which, in shifting the needle into and out of its working position, has a greater angular movement than said needle, substantially as and for the purposes set forth.

Dated July 21, 1886.

AUGUST REICHERT.

In presence of—
LEWIS M. OGDEN,
PETER J. MOHM.