C. A. ROSCHER.
Knitting-Machine.

No. 218,318. Patented Aug. 5, 1879.

Fig. 2.

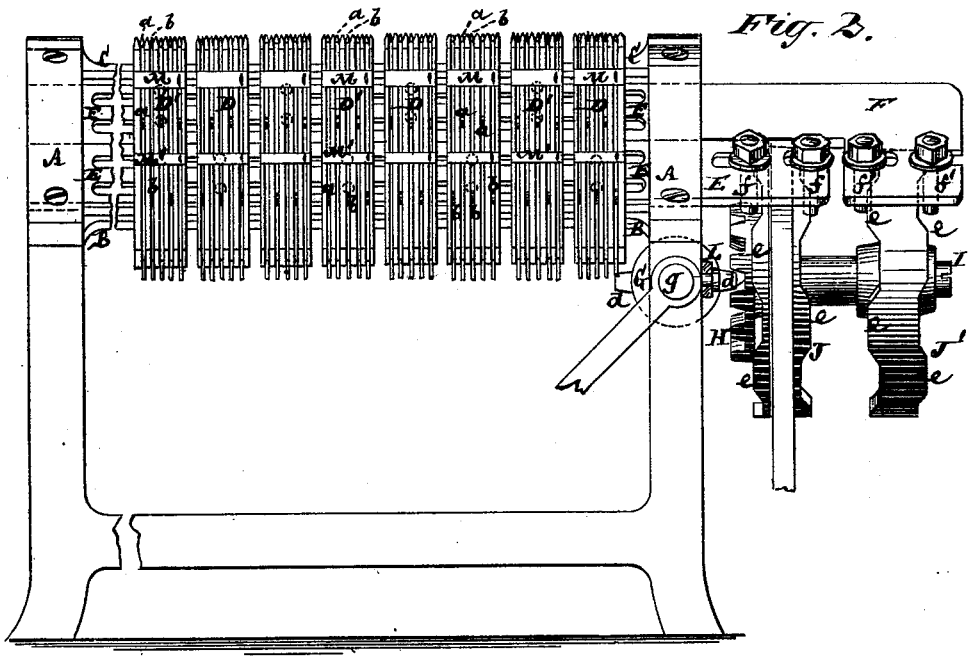
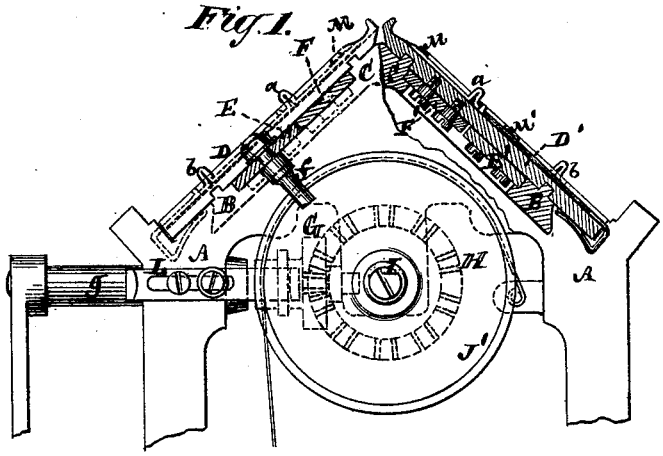


Fig. 1.



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IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **218,318**, dated August 5, 1879; application filed April 4, 1879.

To all whom it may concern:

Be it known that I, CARL AUGUST ROSCHER, of Markersdorf, in the German Empire, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to machines which employ straight rows of latch-needles, and will here be described as applied to that description of such machines in which the needle-bed has two upper sides inclining toward each other, and with their upper edges separated far enough to allow the fabric produced to pass down between them.

The invention consists in a combination, with two or more longitudinal bars of the bed of the machine, and independent needle-plates carried by said bars, and preferably provided with needles of different lengths, of mechanism for automatically reciprocating said bars, whereby a great variety of knitting is or may be automatically obtained and goods produced in a simple and perfect manner having inclined and zigzag rows of loops.

In the accompanying drawings, Figure 1 represents an end elevation of a knitting-machine, in part, having my invention applied; Fig. 2, a sectional side view of the same, in part.

In the drawings, A is a portion of the main frame, provided on both sides of the working-bed with two or more longitudinally-arranged guide-bars, B C, to which are fitted, so as to be capable of sliding on or along them, plates D D′. These plates are constructed with grooves for reception of latch-needles *a a b b*, and are connected to each other in a series or number, and alternately, corresponding to the required pattern of the goods, by means of bars E F E′ F′, which are made capable of motion in direction of their length, and which serve as they are moved to adjust the needle-plates D D′ toward or from each other. This movement of the needle-plates D D′, which controls the pattern, is effected automatically, to which end a wheel, G, on a main rotating shaft, *g*, and having two or more cogs, *d d*, is caused to gear intermittently with a crown or contrate wheel, H, which is fitted to freely turn on a bolt or dead-spindle, I, and which has secured to its hub or nave, so as to turn with it, two or more disks, J J′, having corrugated rims *e e* on opposite sides of their faces, and constituting corrugated-face wheels. These corrugated wheels or disks engage with pins or arms *f f′*, attached to the bars E F E′ F′, which are fitted so as to be capable of a reciprocating sliding motion in parallel directions with the guide-bars B C, and simultaneously in reverse directions to each other. These reciprocating bars E F E′ F′ have secured to them, respectively, the needle-plates D D′, and are actuated once during each half-revolution of the shaft *g* by means of the two cogs *d d* on the wheel G—that is, after each production by the machine of one row of meshes—and the corrugated surfaces *e e* of the wheels J J′ are of a size or depth corresponding to the distance between the needle-plates D D′, so that said plates are moved for the distance between them during the action of the raised portion of each corrugated surface *e* on the arms *f f*, or, in other words, during each movement of the wheel G.

The needle-plates D D′, on both sides of the bed, may be so connected alternately in relation with each other with the reciprocating bars E F E′ F′ as that different motions may be imparted to the same.

By providing the wheel G with only one cog, *d*, then the rows of needles do not shift after each row of meshes, but only after the production of two rows of meshes; and, if desired, an intermediate mechanism, by means of a counter-shaft, can be introduced, whereby three or more rows of meshes may be formed before the shifting of the needle-plates D D′, thus providing for a considerable variation in the patterns to be knitted.

The pins or arms *f f′* may be connected to the reciprocating bars E F E′ F′ by means of hinge-joints or by screws, which allow of removing one or more of said arms from engagement with the corrugated disks or wheels J J′, whereby one or more of the reciprocating bars with attached needle-plates may be put out of work without stopping the remainder.

The wheel G may be in sliding, feather, or

key connection with its shaft *g*, and capable of adjustment by means of a slide, L, or otherwise, to put it in or out of gear with the wheel H, and so to give motion to or to arrest the corrugated disks or wheels J J′. A brake-band may be applied to the outer periphery of the wheel H, or to the periphery of either wheel J J′, to check the motion of the gearing.

Each needle-plate D D′ is grooved and constructed to receive within it rows of latch-needles of different lengths at the same time—that is, a series of short needles, *a a*, and long needles *b b*—which may be alternately arranged in relation with each other. The short needles *a a* are kept in position in the grooves of the plates D D′ by cross-bars or slides M, and the long needles *b b* retained in their places in the grooves of said plates by similar cross-bars or slides M′. By thus using needles of different lengths a greater variety or increased number of knitted patterns may be produced.

The needles *a a* and *b b* may be operated or reciprocated in direction of their length by means of a reciprocating carriage moving in direction of the length of the bed of the machine, and fitted with suitable cams arranged to engage with projections on the needles, as in the case of various knitting-machines.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the longitudinally-movable bars of the bed of the machine, and needle-plates carried by said bars, of mechanism for automatically and intermittently reciprocating said bars, essentially as described.

2. The combination, with the grooved needle-plates D D′, of the needles *a a* and *b b*, of different lengths, applied to said plates, bars E F E′ F′, to which the needle-plates D D′ are secured, and mechanism for automatically reciprocating said bars, essentially as described.

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Witnesses:

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