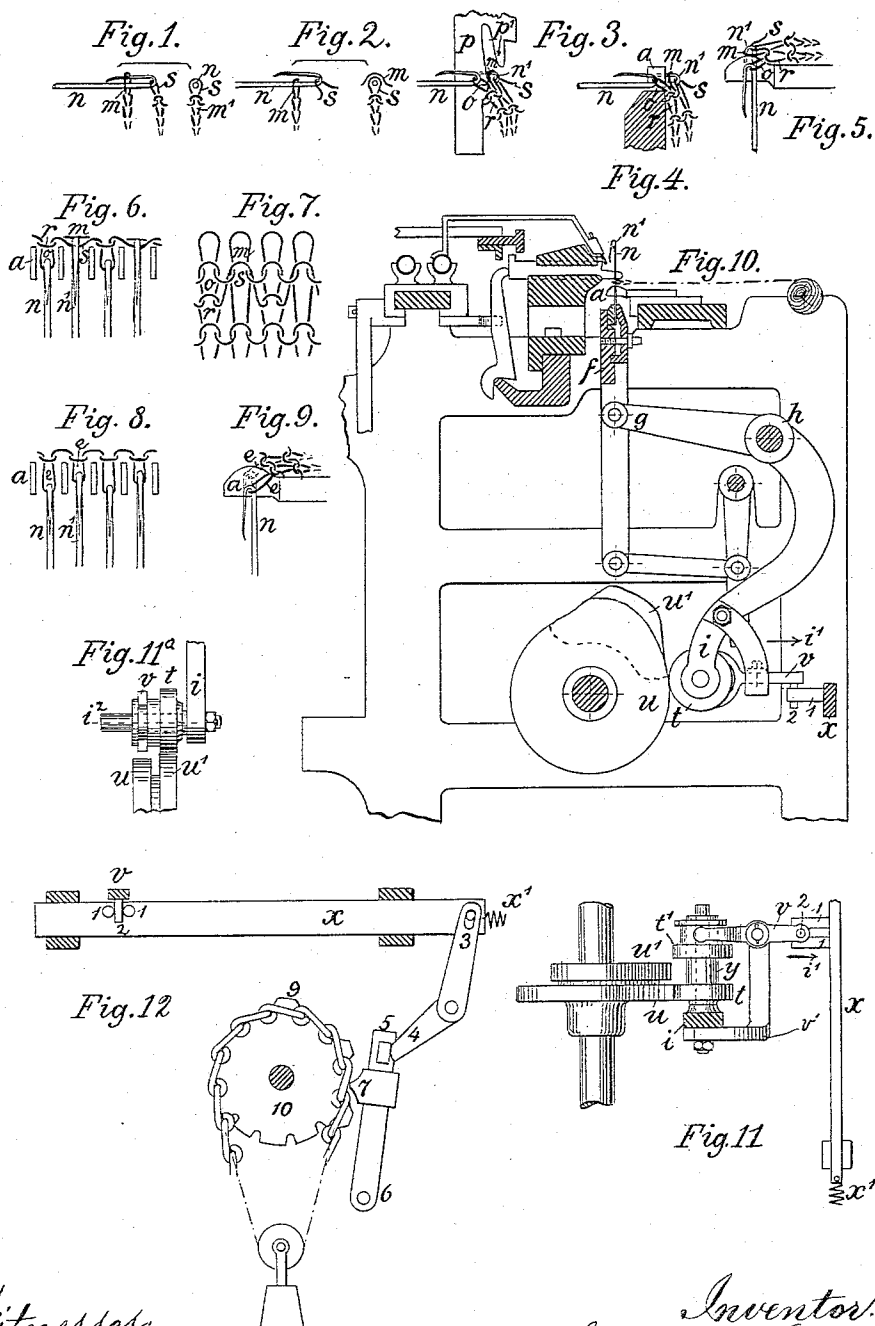


(No Model.)

G. LINDEMUTH.  
STRAIGHT BAR KNITTING FRAME.

No. 476,397.

Patented June 7, 1892.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GOTTHARD LINDEMUTH, OF HOHENKIRCHEN, GERMANY.

## STRAIGHT-BAR KNITTING-FRAME.

SPECIFICATION forming part of Letters Patent No. 476,397, dated June 7, 1892.

Application filed May 11, 1891. Serial No. 392,409. (No model.)

*To all whom it may concern:*

Be it known that I, GOTTHARD LINDEMUTH, a subject of the King of Saxony, residing at Hohenkirchen, Saxony, in the German Empire, have invented certain new and useful Improvements in Straight-Bar Knitting-Frames, of which the following is a specification.

My invention has relation to knitting-frames of that class known as straight-bar knitting-frames; and it consists in the construction, arrangement, and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

In the drawings, Figures 1 to 9, inclusive, are detail views illustrating different arrangements of the needles and the manner of forming single and double or tuck stitches. Fig. 10 is a sectional view of a knitting-frame of the "Cotton" type and illustrating my improvements applied thereto. Figs. 11 and 11<sup>a</sup> are detail views, and Fig. 12 a sectional side elevation of the controlling devices employed.

In producing meshes in knitting-frames the hooks of the needles *n*, Figs. 1 and 2, having the loops suspended from them, are pressed together or closed, and the old meshes *m*, Fig. 1, are passed onto these hooks and then taken off the needles, so that, as shown at *m'*, they engage with the loops *s*, which in their turn form meshes. Should one of the needles *n*, Fig. 2, fail to receive pressure, its preceding mesh is caught in the hook along with the loops *s*, and the latter, instead of forming a new single mesh, forms a double or tuck stitch by the combination of the loops *m* and *s*, Figs. 2 and 7. The present improvement in the production of tuck-stitch patterns specially bears on this well-known feature of the ordinary frames.

In my improved knitting-frame I employ two different lengths of needles—short needles *n* and long ones *n'*, Figs. 3 to 10. The hooks are also of unequal length—that is to say, the points of the hooks are all situated on one line, as before, while the heads or bends of the hooks of the needles *n'* project a few millimeters beyond those of the needles *n*. All these needle-hooks are pressed together or closed and the old meshes or stitches are passed over them, as in Fig. 1; but after this the said old meshes are taken off only from the short

needles *n* and remain suspended from the hooks of the long needles. According to the particular type of knitting-frame different modifications of this mechanism may be employed.

In Fig. 3, where the needles are stationary, the sinkers *p* only move forward the old meshes sufficiently for them to drop off the needles *n*, as shown at *r*, so that new meshes or stitches *o* form on these needles, while the said old meshes remain suspended from the long needles *n'*, as shown at *m*, and when the sinkers *p* withdraw the fabric by means of the projections *p'* to the left there are formed on these long needles *n'* double or tuck stitches, each composed of a mesh *m* and a loop *s*.

In Fig. 4 (where the row of needles is adapted to move horizontally) the needles recede toward the knocking-over comb *a* a sufficient distance to enable the short needles *n* to enter the same, so that the old meshes *r* are knocked over and new meshes or stitches *o* are formed, while the forward ends of the long needles *n'* remain in front of the comb *a*, so that the meshes *m* remain suspended from their hooks, and when the row of needles is again moved to the right, while the fabric is retained in place on each needle *n'*, a mesh *m* will combine with a loop *s*, resulting in a tuck-stitch.

In Figs. 5 and 6 the operation is the same as in the arrangement shown in Fig. 4, except that the row of needles is here vertical and moves up and down instead of to the right and left. As the needles descend toward the teeth of the comb *a* they take up such a position in relation to these teeth that single meshes or stitches *o* are formed on the needles *n* and double or tuck stitches *m s* on the needles *n'*.

When it is desired that meshes should be formed on all the needles, the work previously knitted is knocked over, so that all the meshes slip off their needles. In the arrangement shown in Figs. 8 and 9, for instance, the row of needles *n n'* is drawn downwardly a sufficient distance for new meshes or stitches *e* to be formed on all the needles of the row. The meshes forming on the short needle *n*, however, are somewhat extended, or the old meshes may draw in a piece of the thread between the knocking-over teeth, which may take

place without inconvenience and without interfering with the formation of plain rows of meshes or stitches—that is, without a pattern. For this purpose it is necessary that the knocking-over—*i. e.*, the shifting of the sinkers and of the needles—should be properly controlled. This may be effected in different ways. In Figs. 10 to 12 an arrangement of this kind is shown as applied to a straight-bar knitting-frame of the Cotton type. The lever *gh i* draws downwardly the needle-bar *f* with the needles *n n'*. It is provided for this purpose with an anti-friction roller *t*, operated by the cam *u* in such a manner that the needles do not sink entirely below the knocking-over comb *a*, so that tuck-stitch patterns may be produced. To the cam *u* or cam-shaft *z* is screwed or otherwise secured another cam *u'*, projecting beyond cam *u*. When this cam touches the roller *t'*, Fig. 11, which is laterally movable upon the boss *y* of the roller *t*, it moves the lever, and thereby imparts an additional downward movement to the needles *n n'*, whereby plain rows of meshes are produced. A suitable counting device—such, for instance, as a chain 8, Fig. 12—by means of projections 9 operates a lever 6 7 5, and through it and the bell-crank lever 4 3 a bar *x*, which, through the medium of the lever *v*, Figs. 10, 11, and 12, shifts the roller *t'* laterally. One or more springs *x'* then cause the bar *x*, lever *v*, and roller *t'* to move back again. As shown in Fig. 11<sup>a</sup>, the lever *i*, if preferred, may itself be fitted with a roller *t*, adapted to be operated either by the cam *u'* when plain knitting is the object or, after having been moved laterally, by the cam *u* when it is desired to produce tuck-stitch work, as aforesaid. As shown in Figs. 10 and 11, the lever *v* is pivoted to the bracket *v'*, rigidly secured to the lever *gh i*, and to provide for the part *i* of this lever swinging in the direction of *i'* the lever *v* and the rail *x* are loosely connected by the slot-and-pin arrangement of 1 2 1, Figs. 10, 11, and 12.

I claim—

1. In a straight-bar knitting-frame, the combination, with a needle-bar carrying a row of long and short needles, as described, of a rocking lever connected at one end with the needle-bar and adapted to reciprocate the latter,

a cam-shaft provided with two cams, as described, a roller carried by the lever, upon which roller one of said cams normally acts, and a second roller having connection with the said lever and adapted to be periodically moved laterally to bring it into position to be acted upon by the other cam, for the purpose specified.

2. In a straight-bar knitting-frame, the combination, with a needle-bar carrying a row of long and short needles, as described, of a rocking lever connected at one end with the needle-bar and adapted to reciprocate the latter, a cam-shaft provided with two cams, as described, a roller carried by the lever, upon which roller one of said cams normally acts, a second roller having connection with said lever, a shifting-lever connected with the said second roller and adapted to move the same laterally periodically to bring it into position to be acted upon by the other cam, and a spring acting upon the shifting-lever to cause it to free the second roller from its operating-cam, for the purpose specified.

3. In a straight-bar knitting-frame, the combination, with a needle-bar carrying a row of long and short needles, as described, of a rocking lever connected at one end with the needle-bar and adapted to reciprocate the latter, a cam-shaft provided with two cams, as described, a roller carried by the lever, upon which roller one of said cams normally acts, a second roller having connection with the said lever, a shifting-lever connected with the said second roller and adapted to move the same laterally periodically to bring it into position to be acted upon by the other cam, and means for operating the shifting-lever, comprising a traveling chain having projections, a pivoted lever, upon which said projections act, and a bell-crank lever having one end adapted to be acted upon by the pivoted lever and its opposite end connected with the shifting-lever, as described.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

GOTTHARD LINDEMUTH.

Witnesses:

W. PORTER BOYD,  
R. E. JAHN.