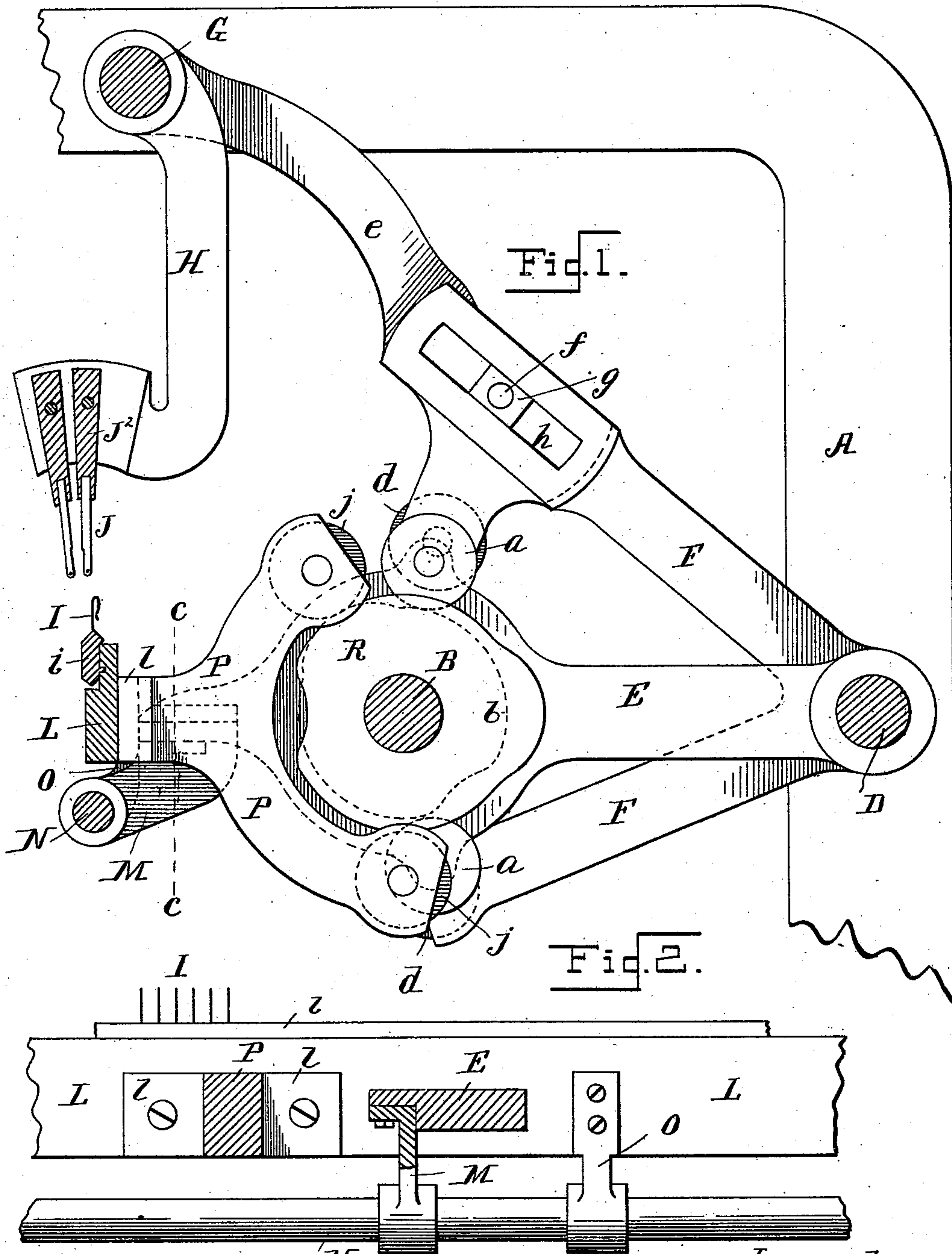


(No Model.)

W. CAMPION.
WARP KNITTING MACHINE.

No. 466,555.

Patented Jan. 5, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM CAMPION, OF BROOKLYN, NEW YORK.

WARP-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 466,555, dated January 5, 1892.

Application filed June 18, 1891. Serial No. 396,658. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CAMPION, a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Warp-Knitting Machines, of which the following is a specification.

My invention relates to warp-knitting machines, and more particularly to that class shown in United States Patent No. 397,140, dated February 5, 1889. In the said knitting-machines the thread-guide bars are given a longitudinal and a lateral movement to carry the thread around the needles, and the needles are given a movement in the direction of their length to draw the loops; but considerable lateral movement of the guides is necessary in order to wrap the threads on the needles, and therefore the machine cannot work so fast as it would were the movement of the guides lessened.

It is the object, therefore, of my invention to diminish the lateral motion of the guides in laying the threads on the needles, and this I accomplish by giving the needles a certain lateral motion and diminishing the motion of the guides, so that shorter strokes or movements can take place in wrapping the threads on the needles.

My invention consists in the novel details and the combinations of parts that will be more fully hereinafter set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a partly-sectional side elevation of a portion of a warp-knitting machine embodying my invention; and Fig. 2 is a vertical longitudinal section on the plane of the line C C, Fig. 1, showing the relation of the parts connected with the needle-bar.

In the accompanying drawings, the letter A indicates a frame. B is the cam-shaft suitably journaled in said frame. D is a shaft or bar suitably hung in said frame and carrying the needle-bar levers E and the guide-bar rocking levers F, and G is a shaft also suitably hung in the frame and carrying the guide-bar-supporting arms H. The levers E carry rollers *a*, that bear on a suitable cam *b* (see dotted lines) on the cam-shaft B, whereby the levers E are rocked, and thus a

longitudinal motion given to the needles I. The levers F also carry rollers *d*, that are to bear on a suitable cam on the shaft B, whereby said levers are rocked. The levers F are connected by links *e* with the shaft G or with the arms H, which latter carry the thread-guides J on the guide-bars J², whereby the latter may be moved laterally by the levers F. The levers F and the links *e* are to be adjustably connected together, so that the guides J can be moved more or less, as desired, and for this purpose I may use a pivot *f* on the link *e*, that works in a nut *g*, carried in a slot *h* on the lever F, whereby *e* and F are jointed together. By adjusting the nut *g* in the slot *h* more or less motion may be given to the guides, and if it should be desired to have the guides remain stationary it would only be necessary to remove or disconnect the pivot or pin *f*, or else disconnect the shaft B or the roller *d* from the cam that operates the levers F. To move the guide-bars J² longitudinally, the means shown in the aforesaid patent may be used.

All the foregoing parts may be arranged, if desired, substantially as shown in said Patent No. 397,140.

L is the needle-bar, to which the needles I are or may be connected by leads *i*, as usual, or in any suitable manner. This needle-bar is carried by the needle-bar levers or arms E, and the needles have a lateral or sidewise motion, (as well as their longitudinal movement,) and for this purpose the needle-bar L is pivotally carried by the levers E, as shown. To accomplish this I secure to the lever E a foot or support M, by which a shaft or journal N is supported, and from the latter extends a support or bearing O, that is secured to the needle-bar L, (see Fig. 2;) but it is evident that the details for connecting the needle-bar L pivotally with its lever E can be varied, as may be desired.

To impart a lateral motion to the needles and needle-bar, I secure to the needle-bar L one or more arms P, which are preferably forked at the outer ends, as shown, so as to be raised and lowered or rocked by a cam R on the shaft B. The outer ends of the arms P carry rollers *j*, that slide on the cam R, which latter may be of suitable construction to produce the desired motion. The arm P may

have side projections *l*, by which it is to be secured to the needle-bar *L*. With the foregoing arrangement as the cam *R* rotates it will cause the needle-bar *L* and needles to be
 5 moved sidewise or laterally, because the latter are pivotally carried on the shaft *N*.

It will be understood that any desired number of levers *E F*, links *e*, arms *H P*, supports *M* and *O*, and their connecting parts may be
 10 used, according to the size of the machine and the work required.

In accordance with my improvements the guides *J* can be given a diminished lateral motion, or, say, reduced to half or less than half
 15 that heretofore given, and the needles *I* will be given a sufficient lateral motion to enable the thread to be laid around them. Therefore as the lateral motion of the guides is diminished and a certain lateral motion is given to
 20 the needles it is evident that the machine can work faster on account of the small amount of motion necessary to lay the threads around the needles. The longitudinal motion of the
 25 threads as usual.

By causing the guides *J* to remain stationary and giving the needles *I* a sufficient lateral motion the machine will work, but with a speed reduced compared to the speed when
 30 both the guides and needles have a lateral motion.

It is evident that the needles can have a lateral motion imparted to them otherwise than by the forked arm *P*; but the manner
 35 shown gives a very positive action.

Having now described my invention, what I claim is—

1. In a knitting-machine, the thread-guides, combined with laterally-movable needles and
 40 means for moving said needles laterally, substantially as described.

2. In a knitting-machine, the laterally-movable thread-guides and means for moving the same, combined with laterally-movable
 45 needles and means for moving said needles laterally, substantially as described.

3. In a knitting-machine, the laterally-movable guides, combined with the longitudinally and laterally movables needles and means
 50 for thus moving said needles, substantially as described.

4. In a knitting-machine, the combination

of the guides with laterally-movable needles, a needle-bar carrying said needles, means for moving said needle-bar laterally, arms or le-
 55 vers *E*, pivotal supports between the needle-bar and said arms or levers, and means for actuating said arms, substantially as described.

5. In a knitting-machine, the combination
 60 of needle levers or arms and means for actuating the same with a needle-bar, supports connecting the latter with said arms or levers, needles carried by said needle-bar, and with
 65 means to move said needle-bar laterally, substantially as described.

6. In a knitting-machine, the combination of needle arms or levers and means for actuating the same with a needle-bar and with supports connecting said bar with said arms
 70 or levers, whereby the needles can be moved laterally, a cam for actuating said needle-bar to move the needles laterally, and an arm connecting said needle-bar with said cam, substantially as described.
 75

7. In a knitting-machine, the combination of needle arms or levers, a needle-bar, supports connecting said needle-bar with said
 80 arms or levers, an arm *P*, connected to said needle-bar, and a cam for actuating said arm to move the needles laterally, substantially as described.

8. In a knitting-machine, the needle arms or levers and means for actuating them, combined with supports *M*, connected to said
 85 arms, a needle-bar, means for supporting said needle-bar from the supports *M*, and means for moving said needle-bar laterally, substantially as described.

9. In a knitting-machine, the needle arms
 90 or levers and means for actuating the same, supports *M*, carried by said arms, and rod or shaft *N* on the support *M*, combined with a needle-bar, support *O*, connected thereto and
 95 also to the rod or shaft *N*, and means for moving the needle-bar laterally, substantially as described.

Signed at New York, in the county of New York and State of New York, this 15th day of June, A. D. 1891.

WILLIAM CAMPION.

Witnesses:

T. F. BOURNE,
 S. B. MORSS.