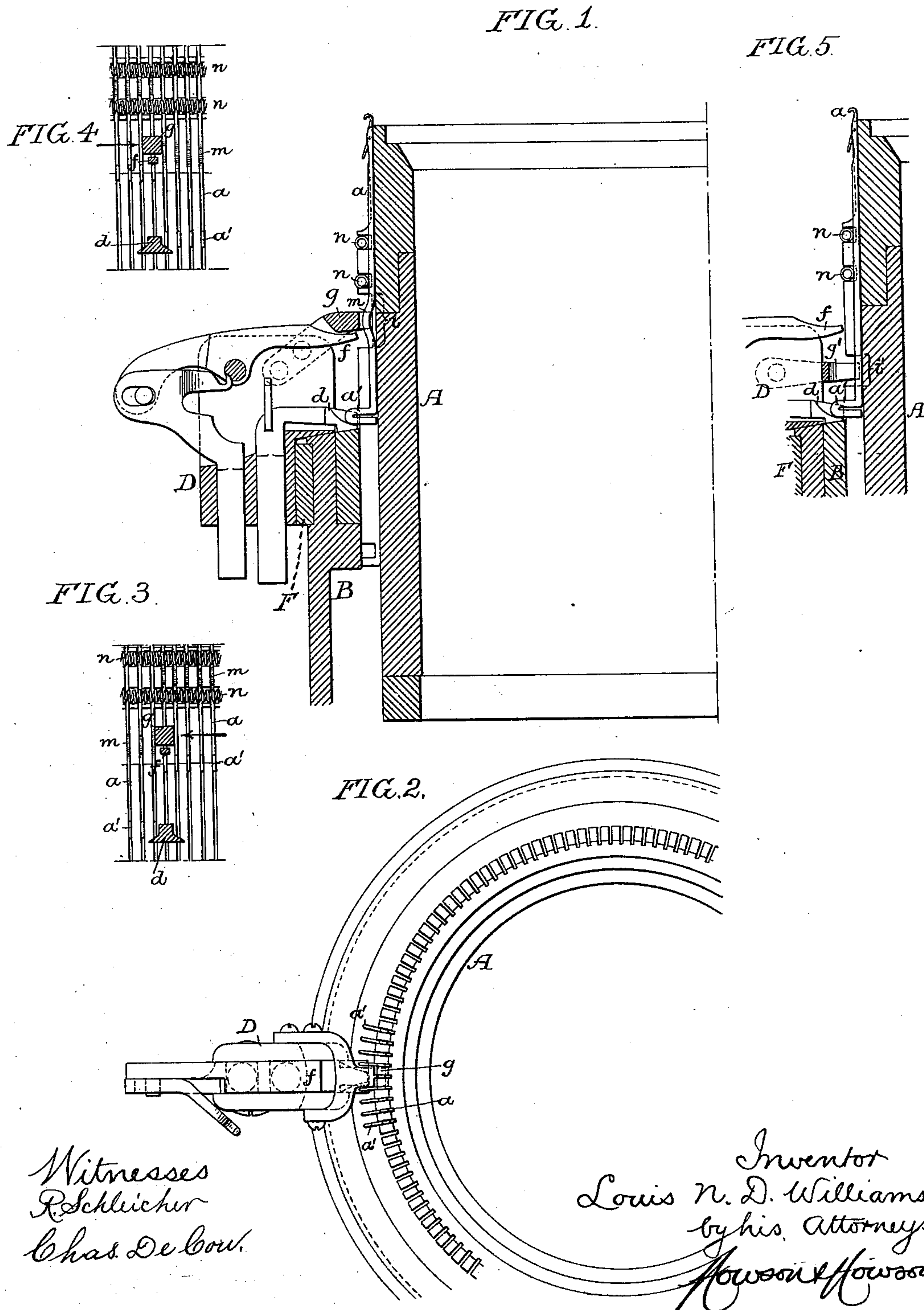


(No Model.)

L. N. D. WILLIAMS.  
NEEDLE PICKING DEVICE FOR KNITTING MACHINES.  
No. 561,037. Patented May 26, 1896.





# UNITED STATES PATENT OFFICE.

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## NEEDLE-PICKING DEVICE FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 561,037, dated May 26, 1896.

Application filed January 7, 1896. Serial No. 574,631. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS N. D. WILLIAMS, a citizen of the United States, residing in Ashbourne, Montgomery county, Pennsylvania, have invented certain Improvements in Needle-Picking Devices for Knitting-Machines, of which the following is a specification.

My invention consists of a certain improvement in the needle-picking device for knitting-machines for which I obtained Letters Patent No. 521,066, dated June 5, 1894, the object of my present invention being to effect the arrest of movement of the picker-carrier without subjecting the bits of the needles to the strain caused by contact of the lifting-picker therewith, as in the patented device. This object I attain by the provision of a contact-finger independent of the lifting-picker, so that the movement of the picker-carrier can be arrested by contact of said finger with some portion of the needle other than the bit.

In the accompanying drawings, Figure 1 is a vertical section of sufficient of a knitting-machine to illustrate my present invention. Fig. 2 is a plan view of part of the same. Figs. 3 and 4 are diagrams illustrating the operation of the picking device, and Fig. 5 is a view illustrating a modification of part of the invention.

A represents part of a needle-cylinder having the usual external vertical grooves for the guidance of the needles *a*, each of the latter having at the bottom a projecting bit *a'*, to be acted upon by the knitting-cams of the cam-box B, which surrounds the cylinder A. These bits are also acted upon by a lifting-picker *d* and a depressing-picker *f*, carried by a block D, which is secured to a ring F, the latter being frictionally mounted upon the cam-box B.

In the machine shown and described in my patent before referred to the movement of this ring F and of the pickers mounted thereon was arrested by contact of the lifting-picker *d* with the bits of the end needles of the acting set, these needles occupying a depressed position, while the needles which are out of operation occupy an elevated position.

In the organized machine the pickers are

combined with suitable mechanism for imparting vertical reciprocation to the acting ends of the same, the lifting-picker being operative during the narrowing operation so as to first lift out of action a needle at one end of the acting set, then a needle at the opposite end of the set, and so on, until the number of needles remaining in action have been limited to the desired extent, the vertical reciprocation of the lifting-picker being then stopped and the depressing-picker being operated so as to pull the needles down into operative position again, first a needle at one end of the acting set and then a needle at the other end of the acting set, until all of the needles thrown out of action by the lifting-picker are again brought into action. The lifting-picker is thus brought into contact with the bit of each of the picker-controlled needles twice during each fashioning operation, and as the picker is moving with a force dependent upon the momentum of the parts as well as upon the frictional hold of the picker-ring upon the cam-box these continually repeated blows in some cases break or bend the bits of the needles, the blow being delivered upon the outer portion of the bit, which is of necessity some distance from the shank or stem of the needle. In order to overcome this objection, therefore, I now provide a special contact-finger *g*, mounted on the block D and playing in an annular groove or channel *i*, formed in the outer grooved face of the needle-cylinder A, and I form upon each of the picker-controlled needles a slight outward bend or loop *m*, which, when the needle is depressed or in acting position, is contained within this annular groove or channel *i*, so as to be within the path of the contact-finger *g*, the latter being so disposed in respect to the lifting-picker *d* that the movement of the picker-carrier will be arrested by contact of the finger with a needle at one end or the other of the acting set before the lifting-picker is brought into forcible contact with the bit of said needle, whether the picker-carrier is moving in one direction or the other. (See Figs. 3 and 4.)

As the stem or shank of the needle is laterally confined both above and below the loop



*m* the latter is better calculated to resist the blow of the contact-finger than the projecting bit of the needle would be, while the slight projection of the loop outwardly beyond the stem or shank of the needle lessens the leverage exerted. The latter element may be altogether eliminated by making the annular groove or channel for the reception of the contact-finger of such depth that it will extend to the bases of the needle-grooves, as shown, for instance, at *i'* in Fig. 5, the contact-finger *g'* in this case being adapted to act directly upon the straight shanks or stems of the needles and being grooved or recessed for the passage of the needle-bits, the finger being located between the lifting-picker and the depressing-picker.

Above the groove or channel *i* are two smaller grooves or channels, each containing a spring-ring *n*, the vertical space between these two rings being such that when a needle is elevated its loop *m* can be contained between the two rings *n*, said loop thus performing the additional function of a retainer for holding the needle in the elevated position and preventing any accidental displacement of the same when so elevated.

The lower spring-ring alone might be used for engagement with the loop *m* of the needle when the latter is elevated; but the use of the two rings is preferred.

Although I have described my invention as applied to a circular machine, it will be evident that it can be used in connection with straight machines as well. Hence I have used the terms "needle-carrier" and "cam-carrier" as applicable to either construction.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a knitting-machine, of a needle-carrier and its needles, a cam-carrier, and a picker-carrier movably mounted

thereon, and having a needle-lifter and a needle-depressor adapted to act upon the needle-bits, and a contact-finger adapted to engage with the stems of the needles.

2. The combination of a needle-carrier having an external groove or channel, the needles, a cam-carrier, and a picker-carrier movable thereon, and having a needle-lifter and a needle-depressor adapted to act upon the needle-bits, and a contact-finger projecting into the groove of the needle-carrier and adapted to engage with the stems of the needles.

3. The combination of a needle-carrier having needles some of which are provided with an outwardly-projecting bend or loop independent of the bit, a cam-carrier, and a picker-carrier movably mounted thereon and having a needle-lifter and a needle-depressor adapted to act upon the needle-bits, and a contact-finger adapted to engage with said looped or bent portions of the needles.

4. A knitting-machine in which are combined a needle-carrier having needles, some of which are provided with outwardly-projecting bends or loops above the bits, one or more spring rings or bands mounted on said needle-carrier, a cam-carrier and a picker-carrier movable thereon and having a needle-lifter and a needle-depressor adapted to act upon the bits of the needles, and a contact-finger adapted to engage with the outwardly-projecting loops or bends of the same, said loops or bends having, in connection with the spring band or bands, the additional function of supporting the needles when raised.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS N. D. WILLIAMS.

Witnesses:

CHAS. H. BANNARD,  
FRED C. BENNER.