L. W. FIFIELD.

KNITTING MACHINE NEEDLE.

No. 51,577. Patented Dec. 19, 1865.

Fig: 1.

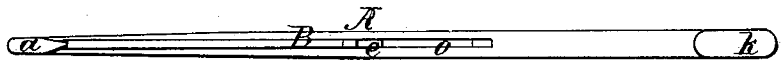


Fig: 2.

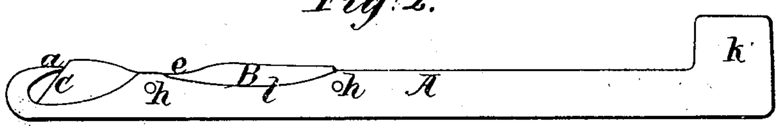


Fig: 3.

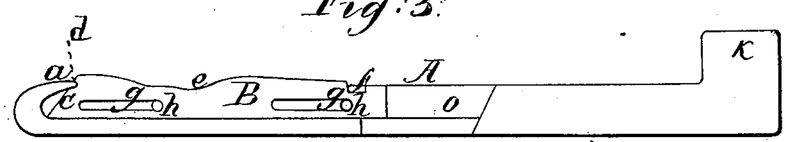


Fig: 4.

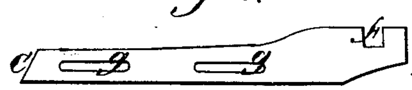
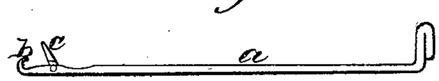


Fig: 5



Witnesses

W. Irving Thayer

F. F. Hale Jr

Inventor;

Levi W. Fifield

Per R. H. Eddy Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEVI W. FIFIELD, OF NEW HAMPTON, NEW HAMPSHIRE.

IMPROVEMENT IN KNITTING-MACHINE NEEDLES.

Specification forming part of Letters Patent No. **51,577**, dated December 19, 1865.

To all whom it may concern:

Be it known that I, LEVI W. FIFIELD, of New Hampton, in the county of Belknap and State of New Hampshire, have made a new and useful invention having reference to the Needles of Knitting or Hosiery Looms or Machinery; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view of a hooked needle provided with my invention. Fig. 2 is a side elevation, and Fig. 3 a longitudinal section, of it. Fig. 4 is a side view of a needle-slide provided with a back notch and cammed front end, but having no loop-notch. Fig. 5 will be hereinafter explained.

In carrying out my invention I construct the hooked needle with a groove, *o*, arranged longitudinally in its shank A and in rear of its hook *a*, such groove being in the plane of the hook and for reception of a closer or slide, B. The front end of such closer or slide B, I form at an acute angle with the lower edge of the slide, or, in other words, cammed, as shown at *c*; and I also construct in the said front end a recess, *d*, for the reception of and for protecting the point of the hook from being caught in a loop while the latter may be in the act of being drawn along the needle. Furthermore, in the upper part of the closer or slide B, and at a short distance in rear of the front end of such slide, I make what I term a "loop-notch," *e*, such notch being formed as represented in Fig. 3. The slide may also be constructed either with or without a back notch, as seen at *f*, such back notch being for the reception of mechanism for producing or insuring the longitudinal movements of the slide or closer. The said slide or closer is also constructed with one or more slots, *g*, extending through it, to receive pins *h h*, which go through them and the shank of the needle, and serve to retain the slide in its proper connection with the said shank. These slots and pins also answer the purpose of determining the extent of longitudinal movements of the slide relatively to the hook of the needle. The forward movement of the slide should be such as not only to allow the hook to enter the recess *d*, but to prevent the slide from contact with the point of the hook, whereby injury thereto might result.

The shank A is constructed with a notch, *l*, to enable the loop to enter or remain in the notch *e* of the slide while the needle is in the act of being moved longitudinally. The shank A may be provided with the usual projection, *k*, for entering the groove of the slide-operating cam.

The closing-slide or needle-closer B, constructed with the cam *c* and the loop-notch *e*, and combined with the shank of the hooked needle in manner substantially as described, will be operated to excellent advantage by the loops during the advance and retreat of the needle. While the needle is in the act of being retracted the knitted loop is in the notch *e*, and will hold the slide stationary or prevent it from being moved with the needle until the point thereof is brought up into the recess *d* of the slide. The further retraction of the needle will cause the slide and the needle to move backward simultaneously, and the loop to be drawn off the needle and over its hook, and the yarn laid in the hook. Next, on the advance of the needle the new loop formed by such yarn will force or keep the slide back and raise the incline *c* and pass into the notch *e*, ready for effecting the closing of the slide during the next retreat of the needle.

From the above it will be seen how the needle-closer B is operated by the needle and the loops, and that in reality it requires no additional mechanism to effect the movements of such slide relatively to the hook. But in order that there may be no uncertainty as to the movements of the slider, it may be constructed with the back notch *f*, or its equivalent, the same being for the purpose hereinbefore explained.

The sliding closer B, made and applied to the hooked needle in manner as described, has many advantages over the ordinary revolving latch closer. In the first place it is not so liable to become broken or injured. It is cheaper of construction, and operates with greater certainty. It is very difficult to make the latches of the right shape and temper, and as they are of necessity very small, they are consequently weak and easily bent or broken, thereby often causing much trouble to the knitter.

The closing-slide, when made and applied to the needle as described, has no part so exposed as to be easily disengaged or broken. The

slide is mostly incased within the body of the needle, and is thereby so protected that nothing short of bending or breaking the needle can do injury to the slide. The slide, in comparison to the rotary closer, will effect a large saving to the knitter, and, besides, produce better work, the fabric being even and free from holes, on account of there being so little liability of dropping the stitches, and, besides, the amount of work per day produced will be much more than can be effected by the needles when provided with the latches or rotary closers.

The body of the needle may be made from sheet-steel, in which case it will be much more durable than that of the ordinary needle made from wire and provided with a turning-latch, such a needle, in side view, being represented in Fig. 5, in which *a* denotes the shank, *b* the hook, and *c* the turning-latch, of the needle.

I do not claim a hooked needle having its shank grooved for the reception of a closing-slide; nor do I claim such a slide as made with an inclination or cam at its front end, and also with a slot to receive a pin, such slot and pin being arranged so as to simply hold the slide in connection with the shank, without being able to act as a means of arresting the slide so that it may not come in contact with the hook of the needle.

I claim—

1. The combination and arrangement of the notches *e* and *l*, with the closer B, its cam *c*, and the grooved and hooked shank A.

2. The combination and arrangement of one or more slots, *g* and pins *h*, with the hook *a* and the recess *d* of the needle A and its closer B, each slot and its pin in such an arrangement serving not only to hold the slide in connection with the needle-shank, but to estop the slide in its forward or forward and backward movements, as set forth.

LEVI W. FIFIELD.

Witnesses:

A. BURPEE,

F. C. WELLS.