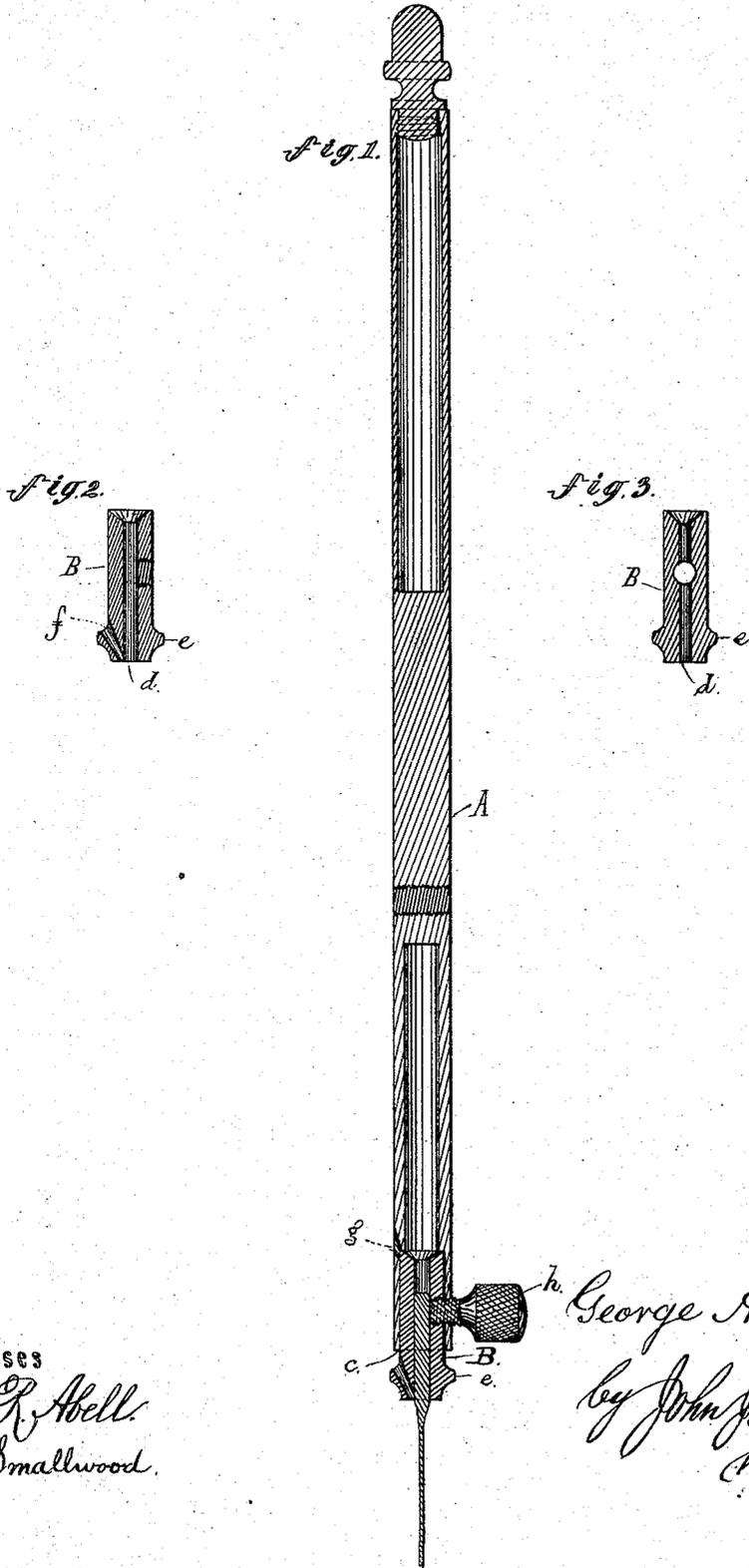


G. A. FAIRFIELD.

Needle-Bars for Sewing-Machines.

No. 158,167.

Patented Dec. 29, 1874.



Witnesses

Cha. R. Abell.  
Geo. T. Smallwood.

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# UNITED STATES PATENT OFFICE.

GEORGE A. FAIRFIELD, OF HARTFORD, CONNECTICUT, ASSIGNOR TO  
WEED SEWING-MACHINE COMPANY, OF SAME PLACE.

## IMPROVEMENT IN NEEDLE-BARS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **158,167**, dated December 29, 1874; application filed  
October 5, 1874.

*To all whom it may concern:*

Be it known that I, GEORGE A. FAIRFIELD, of Hartford, Connecticut, have invented certain Improvements in Needle Bars and Holders for Sewing-Machines, of which the following is a specification:

The object of my invention is to improve the efficiency of sewing-machines, and to furnish a needle-bar and needle-holder, whereby a straight needle adapted for one machine may be used in any other machine employing a straight needle.

My invention consists in combining, with a socket-piece for holding the needle, and with the needle-bar for holding such socket-piece, a single set-screw, serving to hold the needle to the piece and the piece to the bar, as hereinafter described; and it further consists in connecting, with an axial bore in the needle-bar, a lateral opening communicating therewith, to facilitate the removal of the socket-piece from the bar, as hereinafter set forth.

In the drawings accompanying this, Figure 1 represents a needle-bar, partly in section, with my improvements thereon; Fig. 2, a vertical section of the socket-piece or plug; and Fig. 3, a vertical section of the same plug, but in a line transverse of that in Fig. 2.

A is the needle-bar, made of unhardened metal, and which may therefore be easily ground and trued. B is a socket-piece or plug, adapted to be placed in a large axial socket or hole, *c*, drilled in the lower end of the bar; and through this plug is drilled an axial bore or hole, *d*, of a size adapted for the shank of a needle used in one class of machine, other such plugs adapted for the shanks of needles of other classes of machines being also provided for such needle-bar, so that any well-known straight needle may be used in any straight-needle machine, remedying the difficulty heretofore so annoying of being limited to a certain kind only, and of being obliged to stop work if they were not at hand. In drilling the large hole *c* for the reception of the plug there is no difficulty in getting it axially true, or, rather, in a line coinciding with the length of the bar, because the size and strength of the drills required to make so large a hole of themselves insure a right line, while it has

been found by practical experience, in drilling the usual small needle-hole in the end of the bar, there was always a tendency and risk of drilling the hole somewhat aslant; and, when so drilled, the bar could not be used; nor could it, because of its length, be turned down on its exterior enough to make its sides parallel with the slanting bore. In the short plug B, however, in case its bore or hole *d* be not strictly axial when first made, it is an easy, cheap, and quick matter to turn down its exterior until it is strictly so, the hole itself forming centers for such turning or grinding down to true, the usual long bar affording no such centers, even if otherwise it could be sufficiently turned down. The plug B I prefer to harden. A knob or head, *e*, on the lower end of the plug, affords a handle, by which it may conveniently be inserted in or removed from the bar, the plug entering the bar to a limited distance only. An eye, *f*, for the thread is made through the side of the knob of this hardened plug to lead the thread to the needle; and the fact that this plug is hardened prevents its being cut away by the thread, as eyes in ordinary needle-bars constantly are, to the damage of the bar, and of the thread, and of the work. A slanting opening, *g*, in the side of the bar, and leading into the socket *c* at a point just above the end of the inserted plug, affords a ready means of pushing out the plug in case, at any time, it sticks too tightly for easier removal.

As the needle is, by my construction, always in the true axial line of the bar, the truest possible right-line movement of the needle is insured, and all lateral strain or leverage is avoided, such as must take place when the needle is secured at the side of the bar or away from its center.

A set-screw, *h*, inserted in a threaded opening in the bar, and also in the plug, performs the double function of holding the plug fixedly within the bar and the needle securely and fixedly within the plug. This avoids any multiplicity of devices for fastenings.

As I make all the plugs (for whatever different sizes of needle their various bores may be adapted) equally fitted for the sockets of the needle-bars, so that, with thousands of bars

and thousands of plugs, the bars and plugs may be interchanged, and yet each be precisely fitted for the other, it will be seen that the screw-thread, both in the bars and in the plugs for the reception of the set-screw *h*, must be so cut as to be always continuous, and have no break when the plug is in place; otherwise the screw could not enter the plug to fasten the needle, but would come to a stop after passing through the bar, because its thread would not conform to and coincide with that in the plug. It will therefore be seen that, if the screw-thread in a given bar and its plug were made at one operation whilst the plug is in the bar, the effect would be that, although such particular bar and plug would have their threads continuous, so that the set-screw could enter both and hold the needle, yet that, if any other plug similarly made were inserted in the same bar, or any other bar applied to the same plug, the set-screw would not pass into the plug. This condition would positively prevent the needed interchangeability of the parts. To prevent this I make the screw-threads in all the bars precisely alike, and sep-

arately cut those in all the plugs, making these also precisely alike, previously arranging so that the thread of the latter shall, when it is in its proper place in the bar, commence just where that in the bar terminates, so as to be continuous with it, and as if they were one. In this way the continuity of the thread of the two parts is insured, whatever plug may be used in any of the bars.

I claim—

1. In combination with the socket-piece *B*, and with the needle-bar, the single set-screw *h*, applied as described, and serving both to hold the needle in the socket-piece and to hold the socket-piece in the needle-bar.

2. The needle-bar, having a large axial bore to receive a removable needle-holding socket-piece or plug, and the lateral opening *g*, leading into the axial bore, substantially as and for the purpose set forth.

GEORGE A. FAIRFIELD.

Witnesses:

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JOHN J. SIBLEY.