

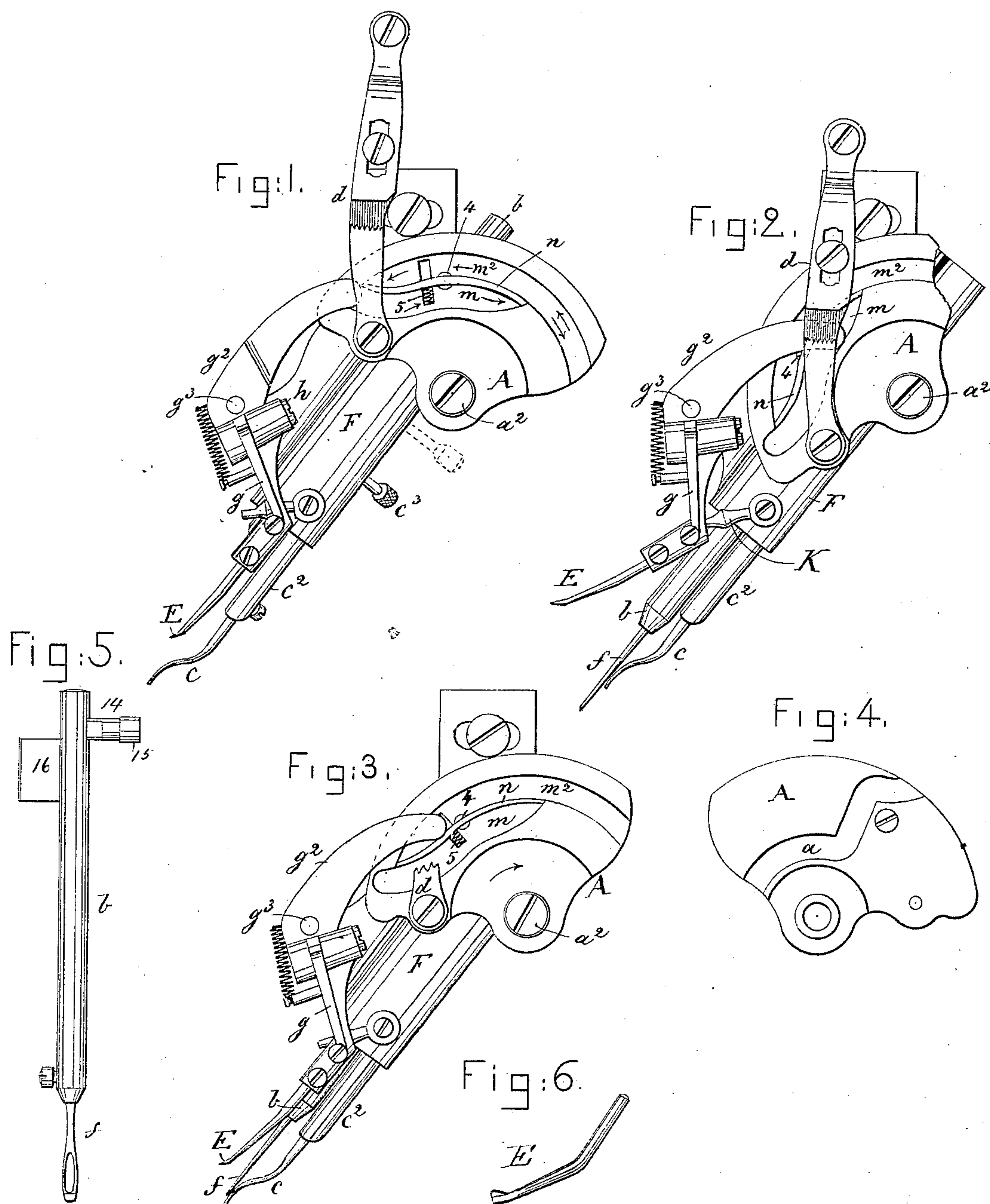
(No Model.)

T. S. L. HOWARD.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 248,746.

Patented Oct. 25, 1881.



WITNESSES.  
L. F. Connor.  
Bernice J. Hayes.

INVENTOR.  
Thomas S. L. Howard.  
by Crosby & Gregory Attys



# UNITED STATES PATENT OFFICE.

THOMAS S. L. HOWARD, OF SOMERVILLE, ASSIGNOR TO GORDON McKAY,  
TRUSTEE, OF CAMBRIDGE, MASSACHUSETTS.

## BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 248,746, dated October 25, 1881.

Application filed June 6, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS S. L. HOWARD, of Somerville, county of Middlesex, State of Massachusetts, have invented an Improvement in Button-Hole Attachments for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification.

This invention is an improvement on the apparatus shown and described in United States Patent No. 199,206, January 15, 1878, and No. 146,000, December 30, 1873, to which reference may be had, and has for its object certain improvements in the construction of the cam for operating the finger which engages the shuttle-thread and lays it in loop form over the edge to be covered, and in the path of the descending needle which carries the needle-thread. In that patent the cam-grooves for operating the finger and also the looper were made at the same side of the vibrating cam-block, and one cam crossed the other, so that at times, at high speed, the movements of the parts were interfered with and the attachment would break.

In this my present invention the cam-groove for the finger is made in the outer face of the vibrating cam-block, and that for the looper at the inner face of the said block; which prevents interference of the parts, and the gate in the cam-groove for moving the finger is in my present invention pivoted substantially at its center instead of at its end, whereby the roll of the finger entering the cam-groove, divided by the gate into two parts, is enabled to be guided and held closely at each side during all its movements, which insures greater certainty of operation for the finger, and enables the machine to be run at higher speed.

Figure 1 represents an outer side view of one of my improved attachments; Fig. 2, a like view thereof, showing the cam and finger in another position. Fig. 3 is another like view, with the finger and cam in a position different from that shown in Figs. 1 and 2, the looper being thrown down. Fig. 4 is a view of the rear side of the cam, showing the shape of the cam-groove for operating the looper. Fig.

5 shows the looper-bar removed from its guiding-sleeve, and Fig. 6 shows details of the end of the finger.

The finger E and the looper *f* are substantially the same in function and operation as the like designated parts in the said patent; but the looper-bar in my application has simply a reciprocating motion, derived from the cam-groove *a* at the rear side (see Fig. 4) of the cam-block A, pivoted at *a*<sup>2</sup> on an ear forming part of the sleeve F, in which the looper-bar *b* is reciprocated. The guide *c*, secured to the lower end of the bar *c*<sup>2</sup>, is to enter the button-hole slit and keep it open. The projection *c*<sup>3</sup> serves as a handle by which to move the guide. The cam-block, in practice, will be connected by an adjustable link, *d*, with an adjustable yoke made to slide backward and forward on the usual vibrating arm of a sewing-machine of the Howe class. Such connection, being common, need not be herein shown. The finger E, having the usual irregular movement imparted to it, is carried by an arm, *g*, pivoted at *h* upon the short arm of a lever, *g*<sup>2</sup>, pivoted at *g*<sup>3</sup> on a suitable ear of the sleeve F, before referred to.

The lever *g*<sup>2</sup> at its upper end has a pin or roll to enter the cam-groove *m m*<sup>2</sup>, made in the outer face or side of the cam-block A. These grooves are divided by a gate, *n*, pivoted near its center at 4, and held in a yielding manner in the position shown in Figs. 1 and 3 by a spring, 5. The pin and roll of the lever *g*<sup>2</sup> traverse the said cam-grooves in the direction of the arrows therein as the cam-block is vibrated about its center *a*<sup>2</sup>. It will be noticed that the said gate forms a division-wall between and leaves the two grooves *m m*<sup>2</sup> of substantially the same width, and the roll during its movements is operated upon positively at both sides, and lost motion is prevented. This gate turns on its pivot 4 and permits the passage of the pin or roll of the lever *g*<sup>2</sup> as the cam-block A is moved from the position Fig. 3 in the direction of the arrow on it into that of Fig. 1. Then the cam-block A will be vibrated in a direction opposite the arrow of Fig. 3, when the said pin and roller will traverse the lower

groove,  $m$ , and enter the upper groove,  $m^2$ , passing under the right-hand end of the gate, which lifts for that purpose, when the direction of movement of the cam-block A will be again reversed, and the said pin and roller traversed along the curved groove  $m^2$ , as shown in Fig. 3.

Fig. 5 shows the stud 14, having the roll 15, which enters the cam-groove  $a$ .

The projection 16 of the looper-bar enters a straight guiding-slot (not shown) at the rear of the sleeve F.

I claim—

1. In a button-hole attachment, the vibrating cam-block A, provided at opposite sides with grooves, substantially as described, combined with and adapted to operate the finger and looper, substantially as set forth.

2. The vibrating cam-block A, provided at one side with the cam-grooves  $m$   $m^2$ , separated by the centrally-pivoted gate  $n$ , combined with a spring to hold the gate, and with the lever  $g^2$  and its pin or roll, adapted to traverse the said cam-grooves, as described, and be acted upon at opposite sides during all its movements, substantially as and for the purpose described.

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

THOMAS S. L. HOWARD.

Witnesses:

G. W. GREGORY,  
BERNICE J. NOYES.