

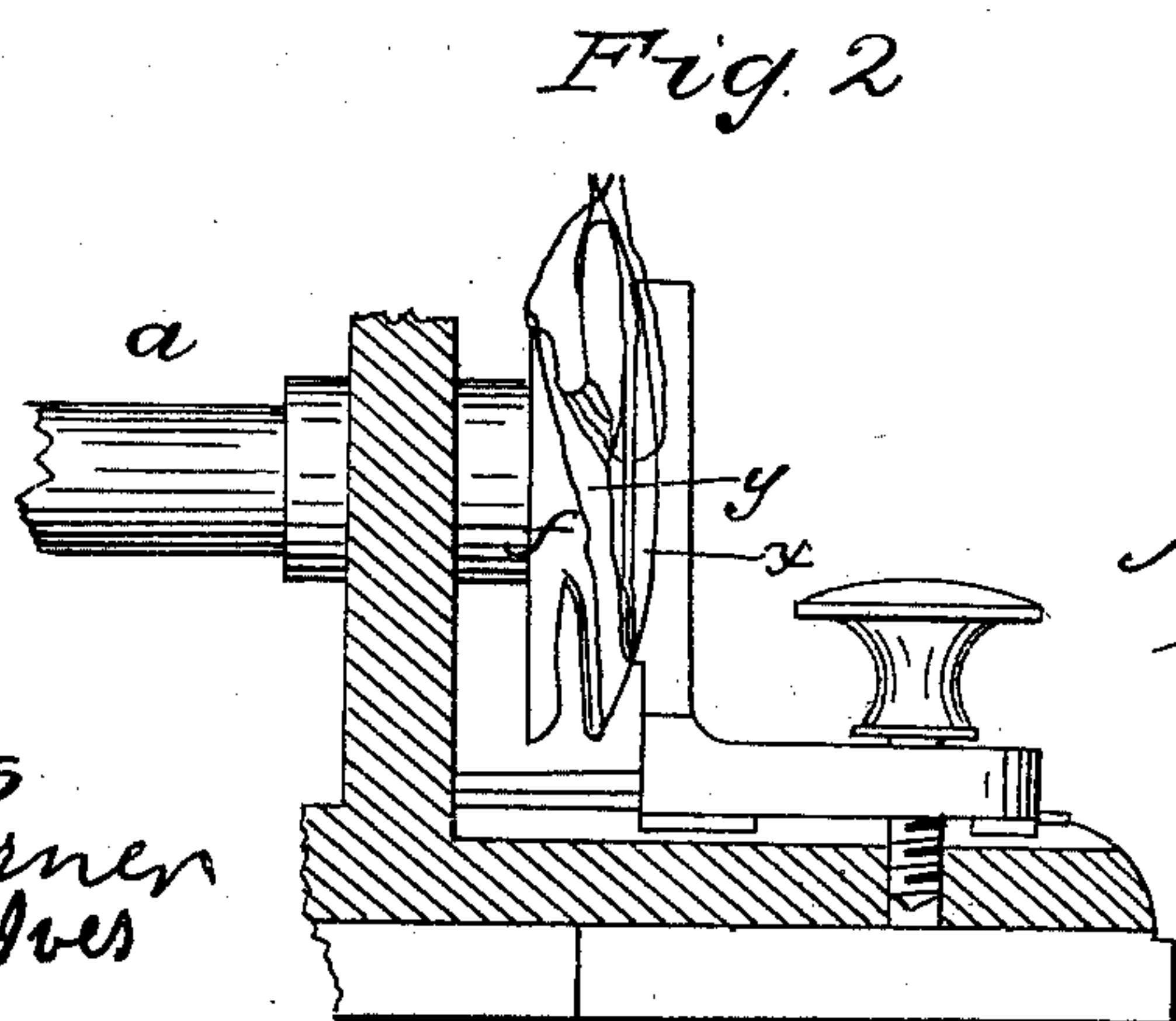
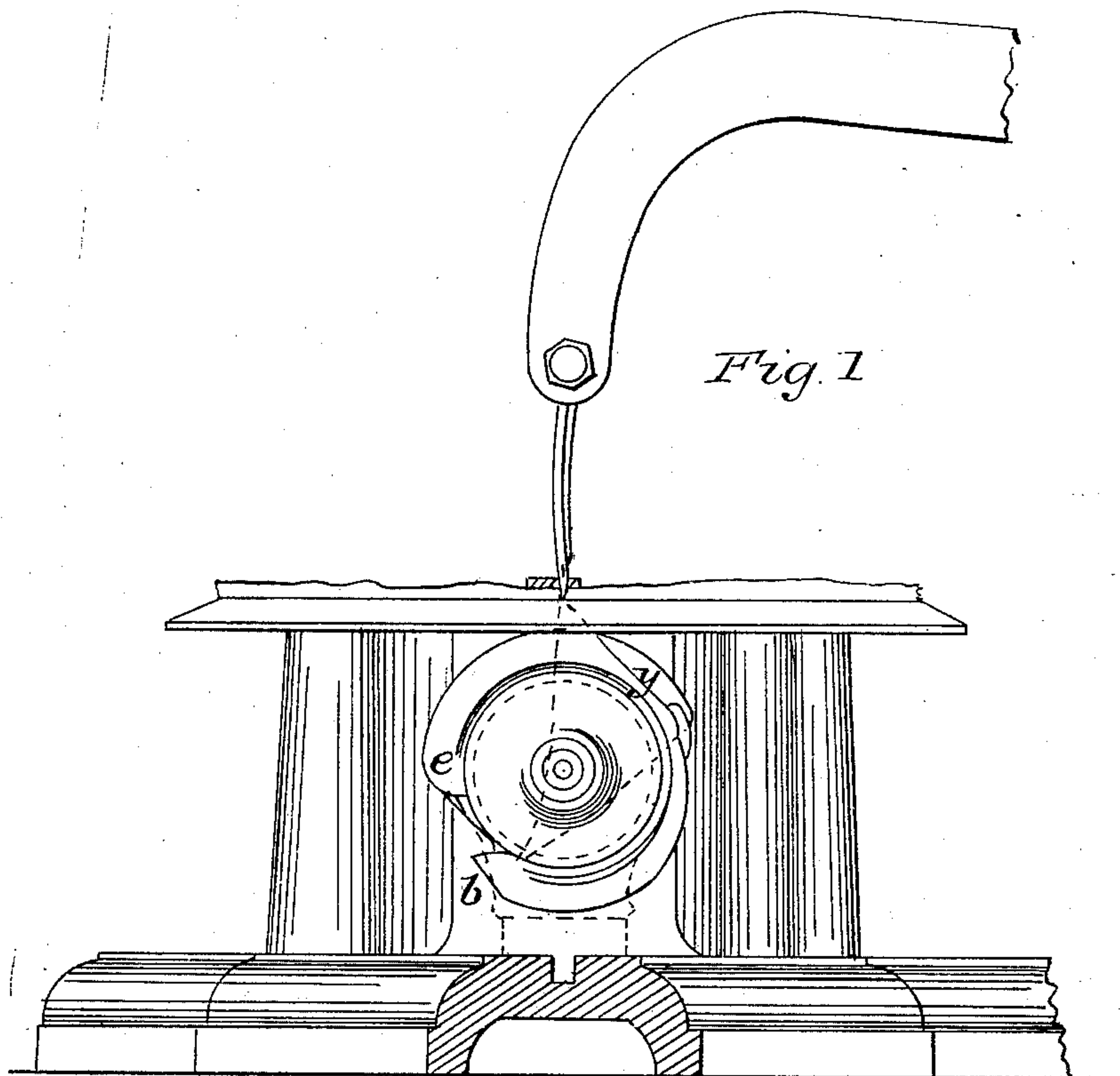
EAMES & MARSH.

Sewing Machine.

3 Sheets—Sheet 1.

No. 41,572.

Patented Feb. 9, 1864.



witnesses
H. N. Warner
Francis Ives

Inventors.
Albert Eames
Clark Marsh
Inventors

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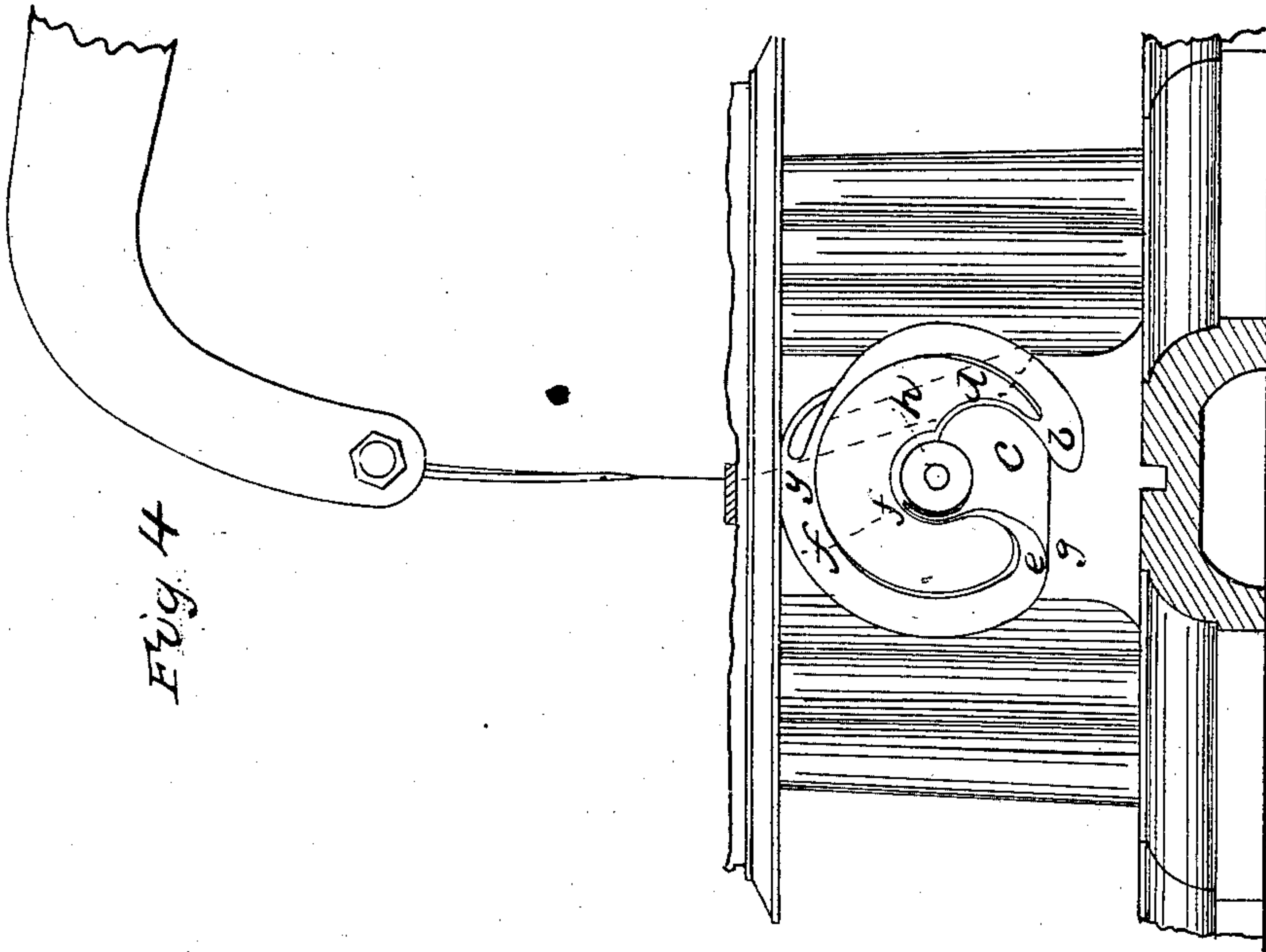


Fig. 4

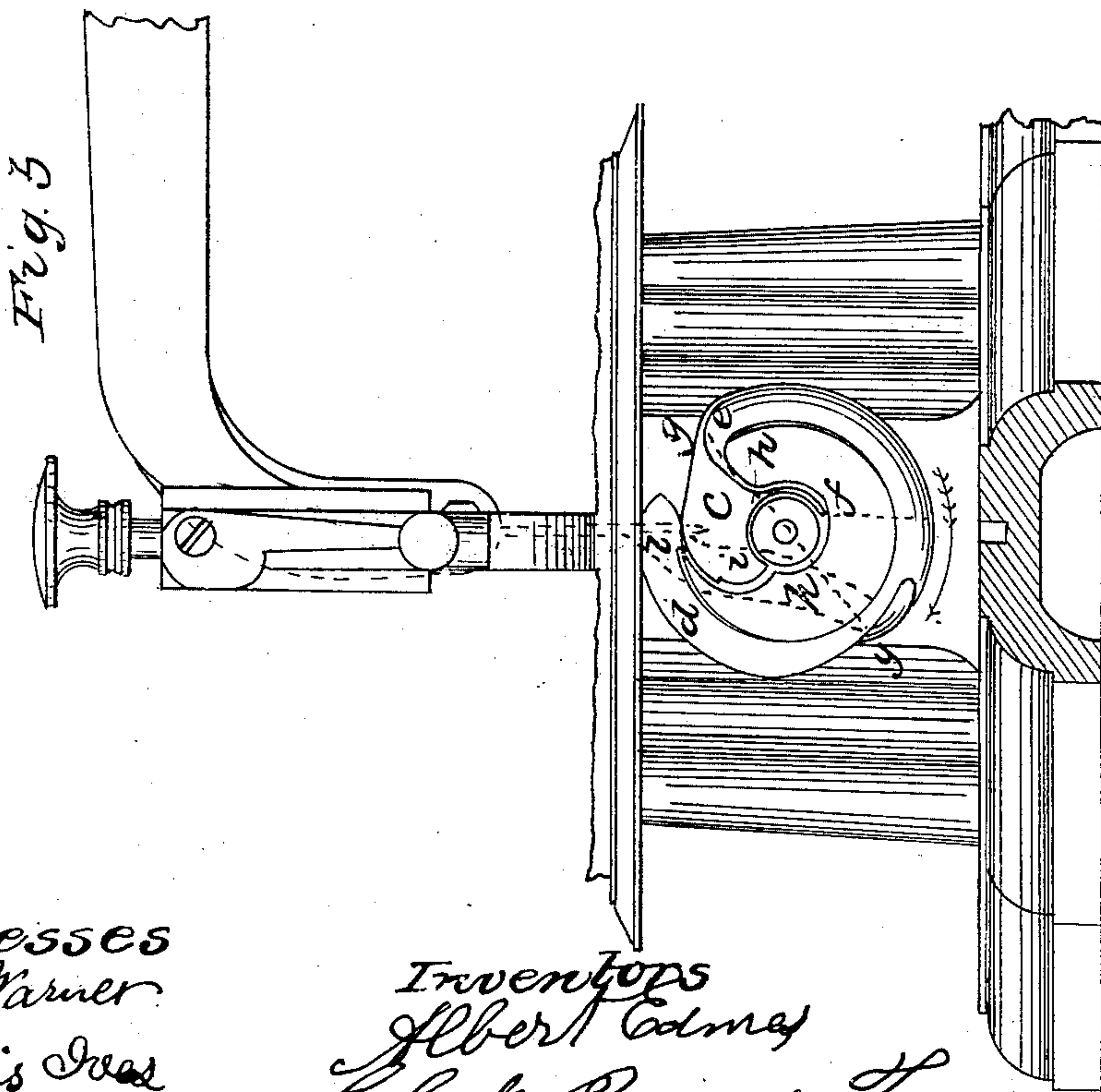


Fig. 5

Witnesses
H. P. Warner
Francis Ives

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EAMES & MARSH.

3 Sheets—Sheet 3.

Sewing Machine.

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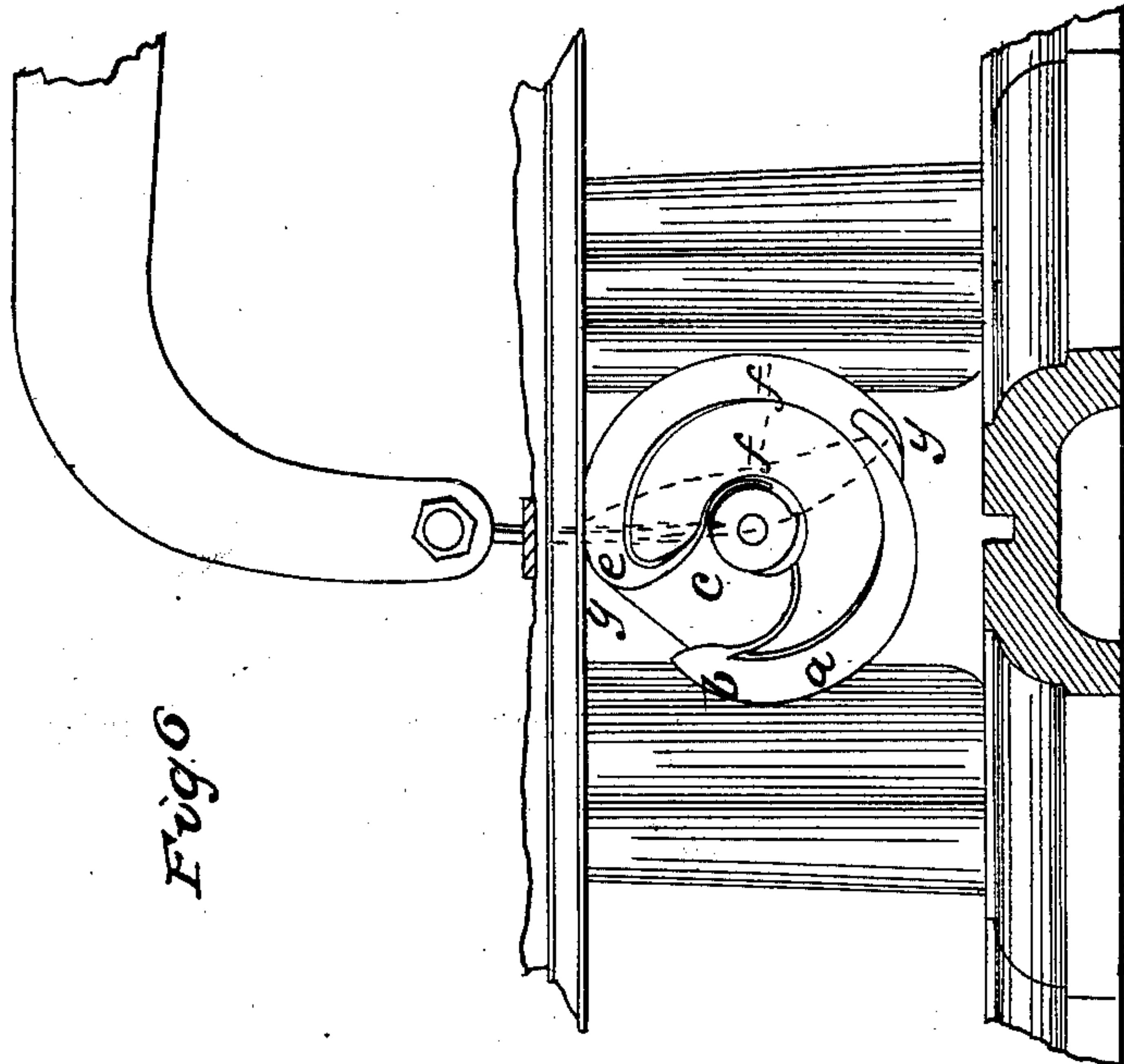


Fig. 6

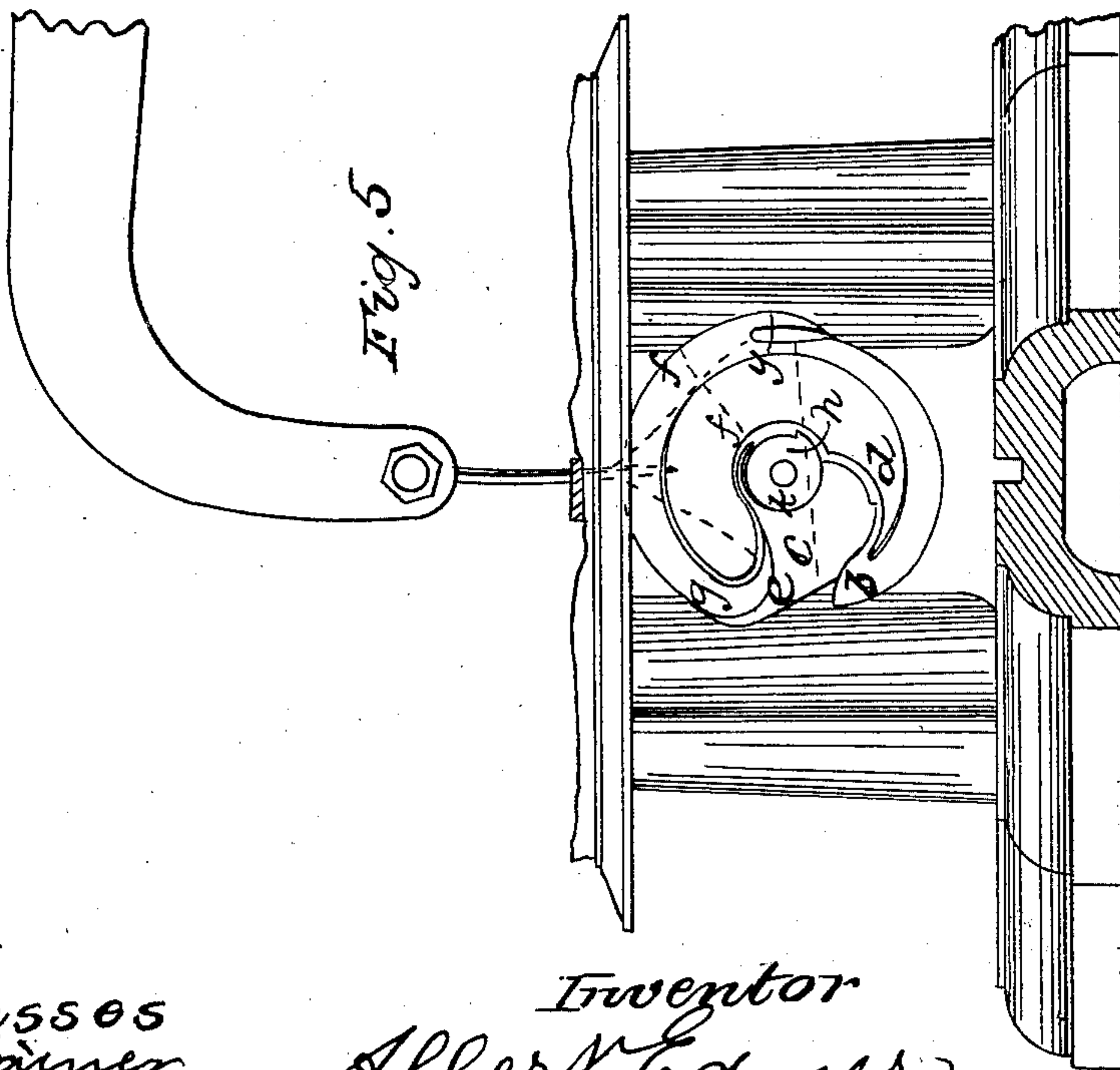


Fig. 5

Witnesses
H. N. Warner
Francis J. Deo

Inventor
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UNITED STATES PATENT OFFICE.

ALBERT EAMES AND CLARK MARSH, OF BRIDGEPORT, CONNECTICUT, AS-
SIGNORS TO THE WHEELER & WILSON MANUFACTURING COMPANY.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **41,572**, dated February 9, 1864.

To all whom it may concern:

Be it known that we, ALBERT EAMES and CLARK MARSH, both residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is an elevation of part of a sewing-machine, showing a table, a needle and part of its arm, a revolving hook, and a bobbin. Fig. 2 is a side elevation of the same hook and bobbin with the standard which holds the bobbin in place; and Figs. 3, 4, 5, and 6 are front elevations of the same hook and needle in different position, the bobbin being left out so as more clearly to show the construction of the hook and its action upon the thread.

The machine represented in the drawings is like an ordinary Wheeler & Wilson machine, with the exception of the hook, and is to be provided with any proper mechanism for moving the needle, with a feed apparatus, bobbin, supporter, thread-guides, presser-foot, and tension apparatus; and those now in use in the Wheeler & Wilson machine are applicable and may be used in connection with the new hook, which, in combination with a needle and bobbin, is the subject-matter of this invention. This new hook has been devised for the purpose of dispensing with the pad of leather or bristles of Wheeler & Wilson machines, or other stationary contrivance which acts in connection with the hook to detain a loop that has just surrounded a bobbin until a new loop is seized by the hook, thus preventing entanglement and breakage of threads. The hook shown in the drawings, as is usual in Wheeler & Wilson machines, seizes the needle-thread from the front side of the needle, (calling that end of the table toward which the cloth is fed the "front of the machine,") and that part of the loop which lies in front of the hook is caused to pass behind the bobbin of lower thread; and it will be necessary to keep these features of its operation in mind in order clearly to understand its action. As the needle-point must pass below the point of the hook, a space must be cut away in the hook for its passage, and the hook must, while providing for all its nec-

essary operations, be so constructed that it can be attached to and moved by a revolving shaft, as distinguished from that kind of hook that is attached to nothing and is rotated by pins or cogs which are alternately in engagement and out of engagement with the hook. In order to provide for these necessities, the construction of the hook is peculiar, and will be first described, and then its operation.

The hook is attached to a revolving shaft, *a*, which may receive motion in any appropriate manner, and its point *b* extends out from and is supported by a piece, *c*, flat on its front side. The rear side of the point is also flat, and the cavity between *c* and the point extends back to about the point *d* on the drawings. The point of the hook therefore extends from *b* to *d*, and is formed as an ordinary Wheeler & Wilson hook to seize a loop and spread it by its rotation, and at the same time to pass that part of its thread which is in front of the hook behind the bobbin *x*.

At *e* is represented what may be called the "tail" or "rear" part of the hook. This part also extends out from and is supported by the piece *c*, and has a cavity between it and the piece *c*, extending from the extremity of the tail about to the points *f f* on the drawings. There is therefore an open slot between the tail of the hook and the piece *c*. The point of the hook and its tail are rounded and beveled, as in ordinary Wheeler & Wilson machines, and are concaved, so as to form a recess, in which is supported the ordinary disk-bobbin of such machines. The point and tail are attached to *c* on that part thereof extending from *f f* to *d*, going by way of *y* on the drawings. The outer periphery of the hook has a rounded groove in it at *y*, the rear side of the hook being beveled off from the rear side of *c* at about the point *d*, and the bevel extending into and forming the front part of the groove *y*. The groove *y* is extended behind *c* to about the point *g* on the periphery of the hook, leaving an open slot extending behind *c* from *y* to *g*, so that if a ruler about a sixteenth of an inch thick were shoved in sidewise behind *c* from the point on the periphery *d* toward the center of the hook its edge would reach across from about *y* past *h* to *g*, (see line *y h k g*, on Fig. 3,) this ruler would lie behind *c*, and a portion of it would be visible in front of the end of the

shaft, the visible portion being bounded by the semicircle *h i k*, Fig. 3. The metal bounded by the circle *h i k f* is fast to the shaft, and forms one piece with the piece *c*, the attachment to *c* being about on the line *g k*. It also is extended and forms the rear side of the groove *y*. The slots between *c* and the point and tail of the hook are for the admission of the needle behind the tail (see Figs. 5 and 6) and the point. (See Fig. 3.) The point is drooped rearward, and beveled so as to throw that part of the loop which lies in front of the point behind the bobbin. The piece *c* is extended outward toward the periphery of the hook from *g*, by way of *b*, and thence to *d*, in order to keep the loop expanded and spread without material slack, and the groove *y* and the slots into which it leads form a secondary hook to hold the loop until the proper time for its release, and the hook, as a whole, must have as essential characteristics a seizing and loop-expanding point, so shaped as to throw the front part of the loop behind the bobbin, a slot or recess permitting the needle to descend below the periphery of the hook, a secondary hook whose office is to detain the loop, and a contrivance performing the duty of the edge of the piece *c*, which extends from *g* by way of *b* to *d*.

The operation of this hook, in connection with a needle and bobbin, is as follows: The needle descends to its full extent and rises a little to open a loop, and the point of the hook then enters and seizes this loop. (See Fig. 3.) As the hook rotates this loop is drawn out and spread, the bight of the loop being caught against the metal where the point joins onto *c*, (see dotted lines *d*, Fig. 4,) that part of the loop in front of the point being thrown under the bobbin, and that part behind the point drawing in behind *c* into the slot extending into the groove *y*. As the hook continues to rotate the thread-loop leads from the needle into *y*, then behind *c* to the part of *c* extending from *g* to *b*, thence forward, and then upward over the tail of the hook to the needle again, (see Fig. 5;) and it is clear that if *c* had not the extension, then a part of the loop would fall in toward the center of the hook and the loop would become slack; and it will also be obvious that the groove *y*, in which the thread lies, acts as a secondary hook, detaining the loop. As the hook rotates farther *y* gradually carries down one part of the loop, while the other part slips along the edge of *c* toward *g*, the thread, needle, and hook now taking the positions as in Fig. 6, and the thread lying over the tail of the hook, thence under the bobbin, then over the periphery of the hook into *y*, thence under *c*, over its edge at *g*, and thence outward and upward to the cloth. The hook, continuing to rotate, carries the bight of the loop downward until just before the point reaches the position Fig. 3. As the point then seizes the new loop and extends it, it forms that extension out of the thread of the old loop, thus lessening

the size of the old loop, which, owing to the rotation of the hook and the relative position of its point and the groove *y* to the needle, is now free to slip off the hook. The groove *y*, in connection with the slot under *c*, extending into that groove, therefore holds the loop until the hook has seized and is ready to extend a second loop, and the rear side of the hook is so beveled as to throw the rear part of each loop into the groove *y*.

From this description it will be perceived that the seizing and spreading of loops and the drawing or extending a second loop out of thread furnished by a preceding loop are as in ordinary Wheeler & Wilson machines; but the casting of the rear part of a loop farther rearward into the groove *y* and the holding of a loop expanded by *y* and the edge of *c* and the detention of the loop by *y* until the point of the hook has entered a new loop are functions different from those of a Wheeler & Wilson hook.

This hook would be useless without a bobbin and a needle; but in connection with them it makes a shuttle-stitch, passing a loop of needle-thread round a bobbin containing a lower thread, and consequently around a lower thread. The new functions of the hook are to hold loops distended and prevent their slipping off and entangling until a new loop is seized, these functions in the old Wheeler & Wilson machines being performed by the joint action of the hook and the pad.

The precise shape of the hook described, which is the preferred form, may be varied so long as the shape is such that the hook will perform the necessary characteristic operations, and the shape of the hook is important only in consequence of its functions being obtained by its shape and operation; or, in other words, the hook must have such a shape that it will seize a loop from the needle, detain it until another is seized, and then cast it off, and also retain the detained loop under such tension, or so spread that it shall not entangle and thus interfere with the proper operation of the machine. The hook must likewise pass loops of needle-thread around a bobbin, and so long as it possesses these modes of operations or performs these functions the shape of the hook may be modified.

What we claim as our invention is—

The combination of an eye-pointed needle and a bobbin with a rotating hook so shaped, substantially as described, as to have the mode of operation substantially as herein set forth, whereby a pad is dispensed with in making a lock or shuttle stitch.

In testimony whereof we have hereunto subscribed our names on the 15th day of April, A. D. 1863.

ALBERT EAMES.
CLARK MARSH.

In presence of—

FRANCIS IVES,
H. N. WARNER.