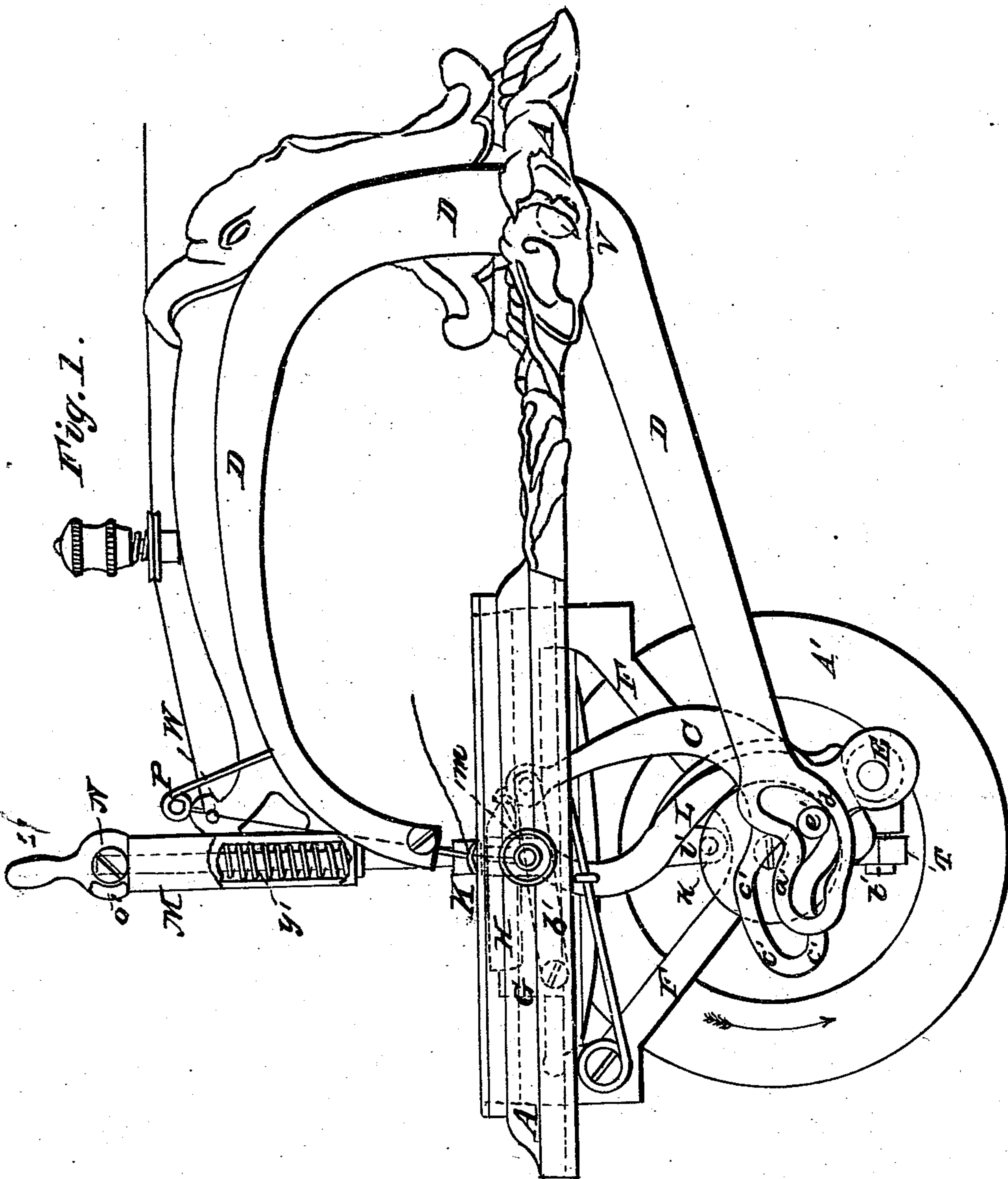


H. C. HECKENDORN.
Sewing Machine.

3 Sheets—Sheet 1.

No. 93,881.

Patented Aug. 17, 1869.



Witnesses:
E. W. Anderson.
James D. Graves

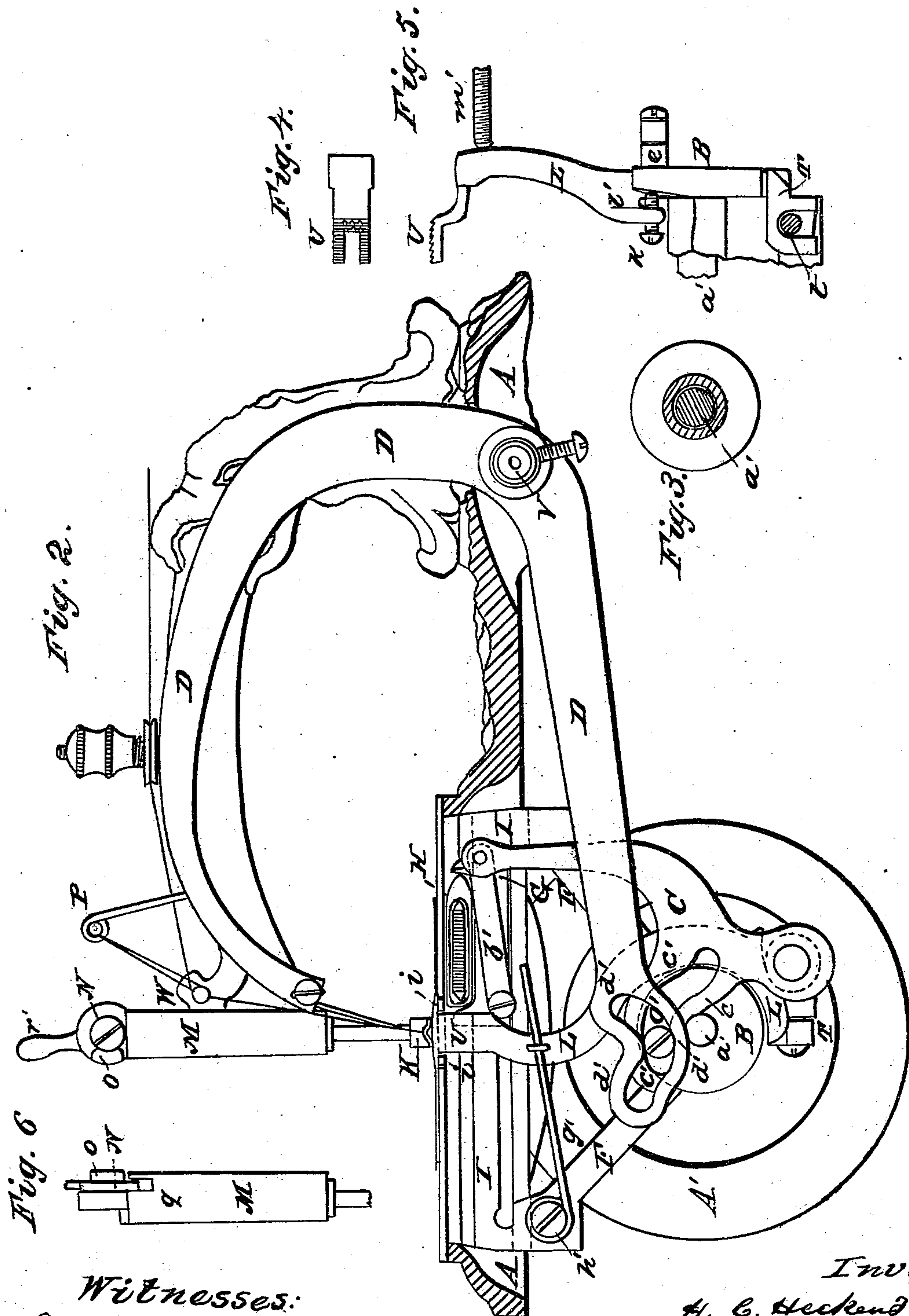
Inventor:
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H. C. HECKENDORN.

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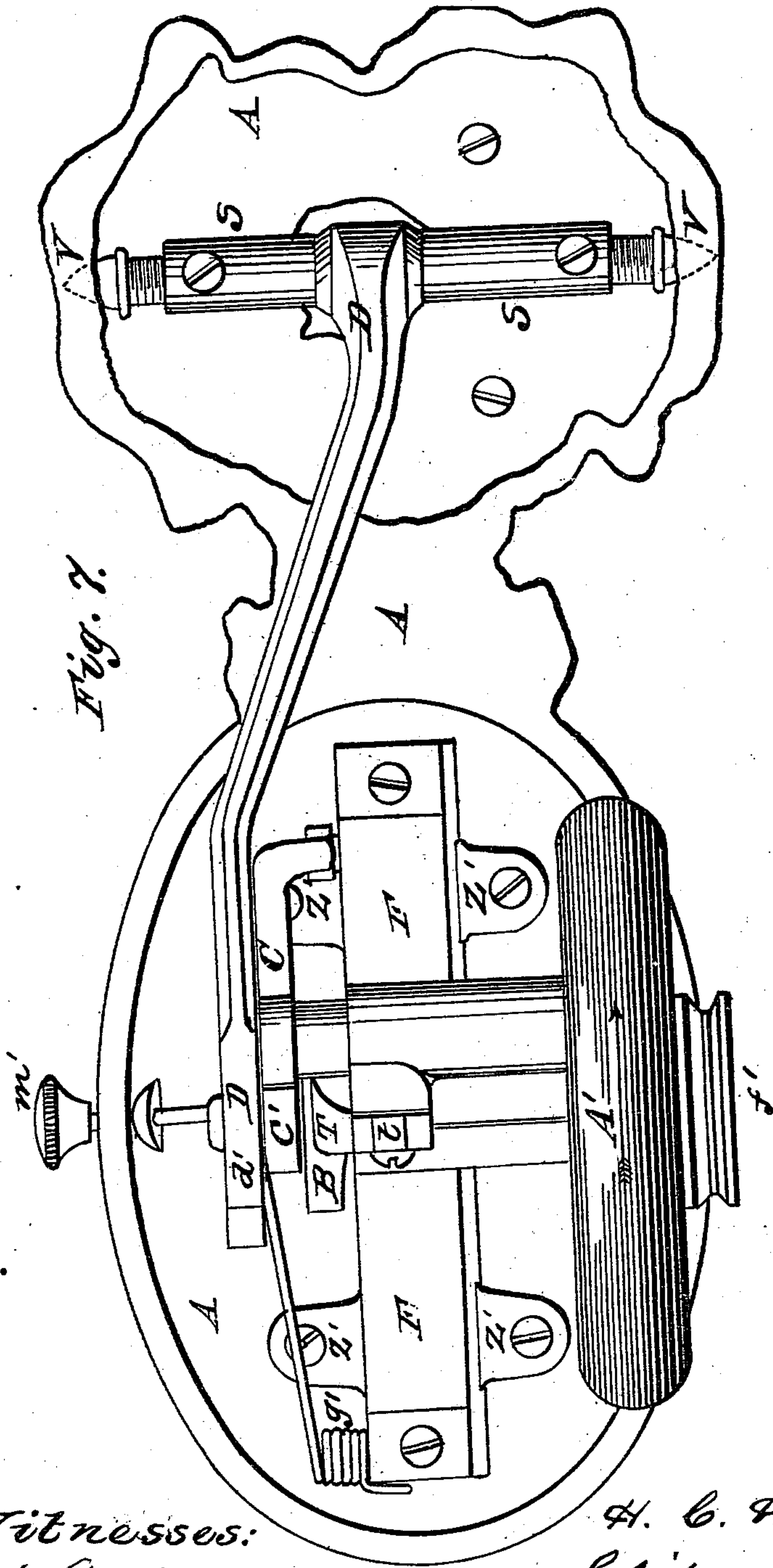


Fig. 7.

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United States Patent Office.

H. C. HECKENDORN, OF READING, PENNSYLVANIA.

Letters Patent No. 93,881, dated August 17, 1869.

IMPROVEMENT IN SEWING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, H. C. HECKENDORN, of Reading, in the county of Berks, and State of Pennsylvania, have invented a new and valuable Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a side view of my sewing-machine, the stitch being commenced.

Figure 2 is the same view, the stitch being finished.

Figure 3 represents a view of the face-cam, whereby the forward horizontal motion is communicated to the feeder.

Figure 4 represents a plan view of the serrated top of the feeder.

Figure 5 represents a front view of the feeding-arm, with its serrated top and slotted foot.

Figure 6 represents a front view of the cylindrical case cast upon the fixed arm of the machine, showing the slot in its top, whereby the cloth-foot is secured in position for use.

Figure 7 represents a bottom view of the sewing-machine.

My invention relates to that class of sewing-machines known as the shuttle or lock-stitch sewing-machines; and consists, mainly, in a novel arrangement of devices for causing the shuttle-thread to be held tense, after passing through the loop in the upper thread, while the needle draws the upper thread across the tense thread of the shuttle up into the fabric being sewed.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, reference being had to the drawings herewith, in which the same letters indicate corresponding parts in the different figures.

My sewing-machine may have the same general form as other lock-stitch machines.

The operation of my sewing-machine is as follows:

The machine being in the proper position, with the oval end of the bed-plate A next to the operator, power is applied by any suitable means to the pulley *f*', firmly screwed on to the left end of the axis *a*' of the machine. This is revolved only in one direction, indicated by the arrow delineated on the fly-wheel A', in fig. 1.

At the commencement of the stitch, the shuttle-driving-arm C, actuated by the pin *e*' moving in the curved slot or cam *c' c'*, returns the shuttle H to its first position nearest to the operator, while the eccentric or cam E, formed about the axis of the shuttle-driving arm C, allows the feeder L to be pulled downward, and the face-cam B allows the feeder to be pulled backward to its first position, by the action of the

spring *g*', firmly wound about the screw-pin *h*', screwed into the hanger F, formed on the lower portion of the shuttle-trough I.

The shuttle-trough I has four lugs *z' z'* cast upon it, through each of which a screw passes, thereby fastening it firmly to the bed-plate A.

At the same time the needle-carrying arm D, actuated by the pin *e*', moving in the curved slot or cam *d' d'* formed in its lower end, passes the needle and thread through the cloth or fabric to its lowest position, and slightly returning the needle, a loop is formed in its thread, indicated by the red lines in the figures.

Now, the shape of the slot in its end being in this portion of its extent concentric with the circular path of the pin *e*', the needle-carrying arm D becomes stationary, while the action of the slot *c' c'* in the end of the shuttle-driving arm C, by its movement about the pin *e*', causes the shuttle H to be pushed by the nearest end of the shuttle-driver G, connected to the head of the shuttle-driving arm by the pitman *b*', through the loop in the upper thread, carrying its own thread, represented in blue lines, and supposed, in the present description, to have one end attached to the cloth after a previous stitch. This motion continuing, the shuttle H is driven forward the entire length of the shuttle-way, drawing its thread tense, and now, the pin *e*' having reached that portion of the curved slot *c' c'* which is concentric with its path, the shuttle-driving arm C becomes stationary, thus causing the shuttle H to be held with its thread tense in the extreme end of the shuttle-way.

At this time the pin *e*', having passed beyond that portion of the slot *d' d'* which is concentric with its path, the needle-carrying arm commences to move, and, continuing, raises the needle to its highest position, drawing up the loop in its thread across the tense thread of the shuttle, and pulling the latter thread also up into the cloth, thus forming a compact and secure lock-stitch.

During the passage of the shuttle through the loop in the upper thread, the action of the eccentric or cam E raises the feeder high enough to bring its serrated top above the surface of the small plate *i*, screwed into the top of the bed-plate, and in contact with the cloth or fabric, and so soon as the needle has reached its highest position, the action of the face-cam B, pressing against the end of the set-screw *k*', passing through the lug *l*, cast upon the feeder-arm or standard L, forces the feeder-top U forward, and its serrated surface biting into the fabric against the smooth under surface of the cloth-foot K, carries the cloth or fabric forward a certain distance, according to the length of stitch required, which length of stitch is regulated by the set-screw *m*', with milled head, working in the side or rim of the bed-plate and acting against the upper

part of the feeder-arm L. The pin *e* has anti-friction rollers.

The stitch having been finished, as above described, is recommenced by the action of the pin *e*, moving in the curved slots, bringing the needle again downward and returning the shuttle to its first position, as set forth above.

It will be observed, by reference to the drawings, that the shuttle is not carried, but slides backward and forward in a way or trough, I, whose walls are in a straight-line parallel with the longest axis of the elliptical or oval bed-plate, and the bottom of which is centrally open during its entire length, forming a long straight slot, through which the upright projections of the shuttle-driver G erect themselves just forward and in rear of the shuttle H, very little play being allowed in order that the shuttle-thread may be kept tense after the shuttle, having passed through the loop of the upper thread, reaches the end of the trough and becomes stationary.

The position of the interlocking point of the upper and lower threads is regulated by the tension-devices respectively acting on each thread, but not essentially differing from those heretofore employed in lock-stitch machines, with the exception of the manner in which the upper thread is wound around the pin W before passing through the wire loop P.

The feeder-top U is shaped in the form of the letter U, or similar thereto, so as to cleave to the cloth or fabric on each side of the needle, as well as in front of the same, thus moving the material with great accuracy.

The feeding-arm or staff L is placed in an upright position, and has a slot, T, formed in its lower end, working about a fulcrum, *t*.

This feeding-arm L has a lug, *l*, cast upon it, through which a set-screw, *k*, works against the face-cam B. It is susceptible of vertical as well as horizontal motion, the latter movement being less curvilinear than when, with the same length of staff, the fulcrum is placed higher.

In order to keep the cloth-foot K steady while the machine is in operation, a slot, *q*, is cut in the top of the cylinder M, which receives the edge of the disk N, when it is turned to the proper position, and the cam *o*, lifted by means of the handle or lever *r*, allowing the spring *y*, coiled in the cylinder M, to pull down the cloth-foot on the material to be sewed.

The axis S of the needle-carrying arm has its journal-centres V V moving on or in fulcra formed in

or on the bed-plate, and as distant from each other as may be desirable to secure accuracy in the movement of the needle, and to avoid play in the course of the seam, the centres V V being separate from the axis S and susceptible of adjustment in the direction of the axis S, by being respectively screwed into or out of the female screws formed in the ends of the axis S.

I am aware that A. H. Sherwood has patented a lock-stitch sewing-machine in which there is combined an oscillating shuttle-arm with an oscillating needle-arm having curved slots, but differing essentially in its results, as in his machine the shuttle is carried backward and forward by the action of a shuttle-carrying arm, and, further, the action of the curved slots is such, after having caused the shuttle to be carried forward its full distance, as to return it somewhat in the opposite direction, thereby allowing its thread to fall and hang loosely upon the loop of the upper thread, to the great danger of there becoming foul and breaking during the operation of sewing, while, in my invention, the shuttle is alternately pushed backward and forward in its own way or trough by the projections of the shuttle-driver; and, further, the action of the curved slots is such, that after the shuttle has passed through the loop in the upper thread, the shuttle-thread is held tense until the needle is raised to its highest position.

I do not claim the curved slots, nor their effect, as shown and described by A. H. Sherwood, in Letters Patent No. 76,950; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The shuttle-driving arm C, constructed as described, having a serpentine slot, *c c'*, and a feed-operating eccentric, E, in combination with the shuttle-driver G, pitman *b'*, needle-carrying arm D, having a serpentine slot, *d d'*, face-cam B, on shaft *a'*, feeder I, and spring *g'*, all constructed, arranged, and operating substantially as specified.

2. The combination, with the needle-carrying arm, of the adjustable centres V V, secured to the shaft S, substantially as specified.

In testimony that I claim the above, I have hereunto subscribed my name, in the presence of two witnesses.

H. C. HECKENDORN.

Witnesses:

JAMES P. GRAVES,
DENNIS D. KANE.