

J. Bond Jr.
Sewing Machine.

N^o 15470

Patented Aug. 5, 1856.

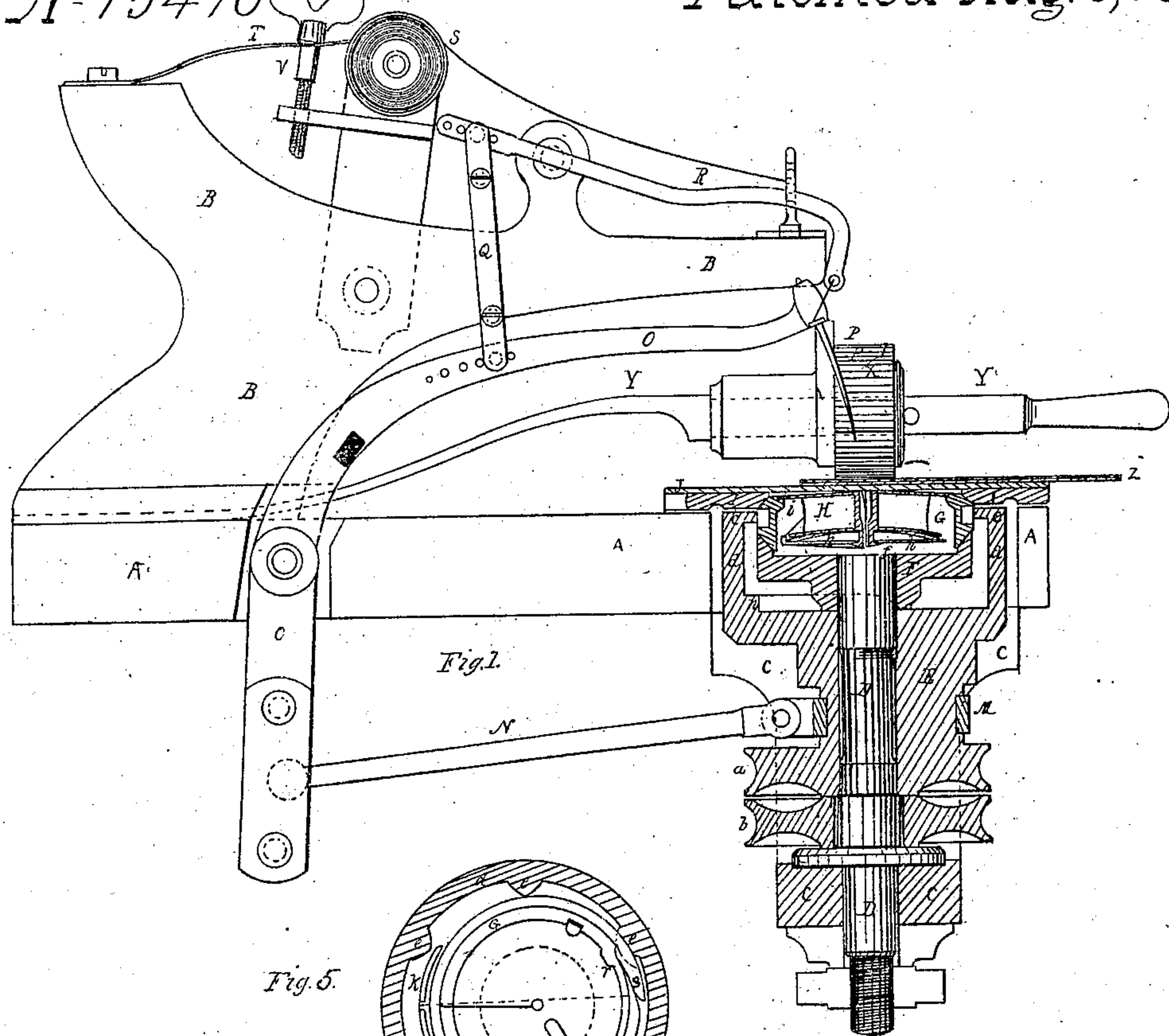


Fig. 5.

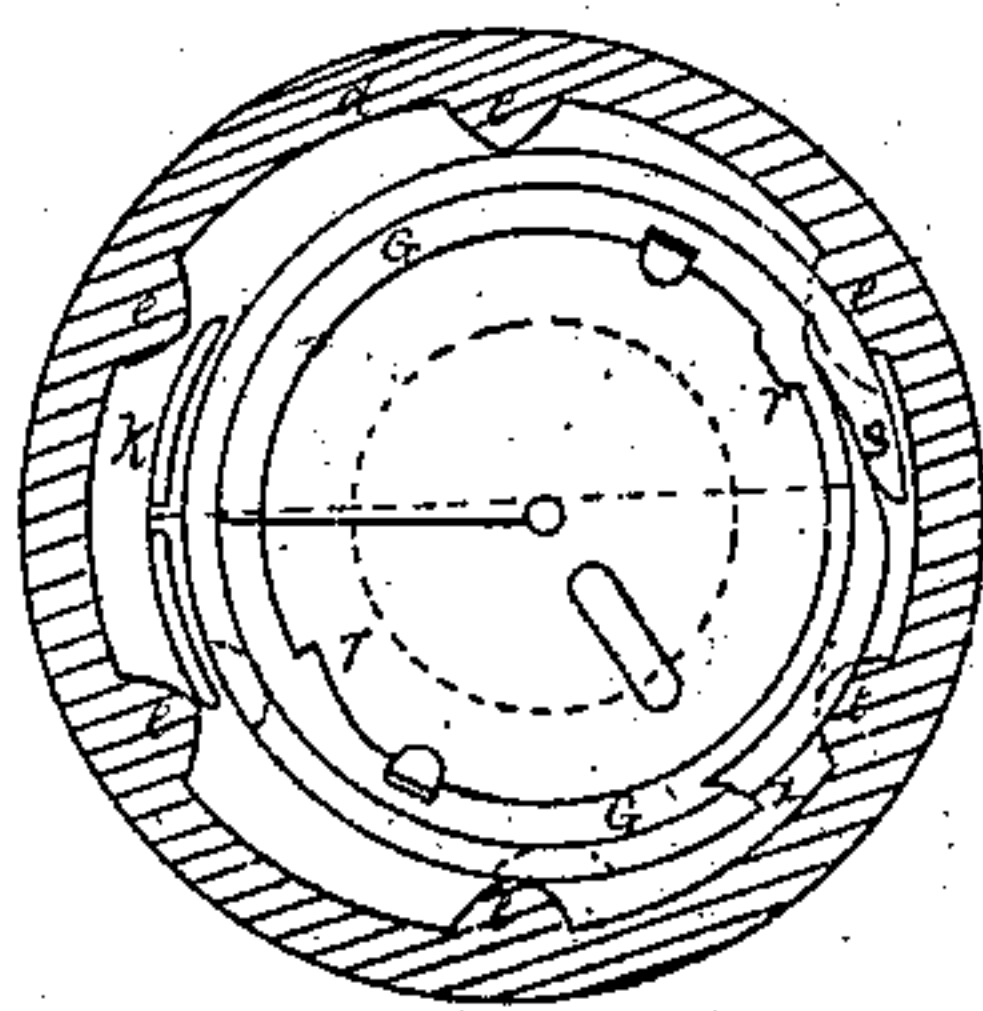


Fig. 4.

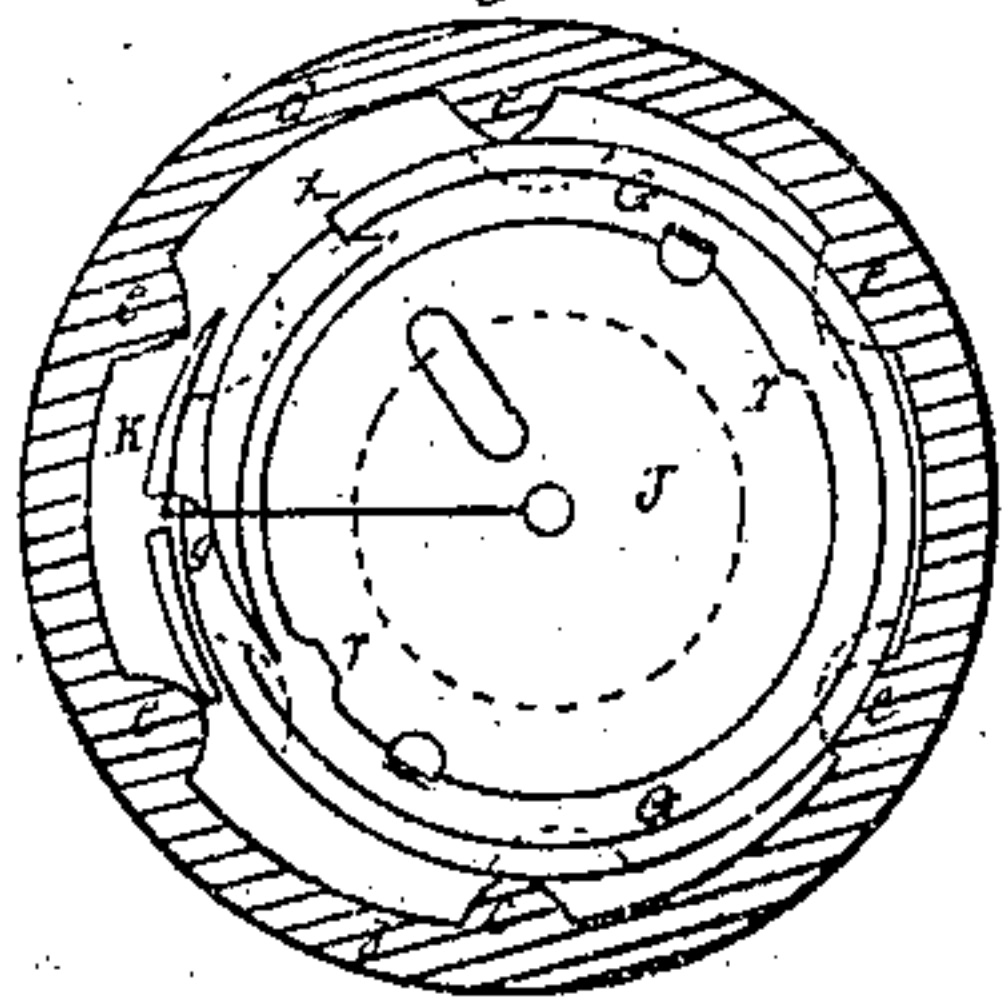


Fig. 3.

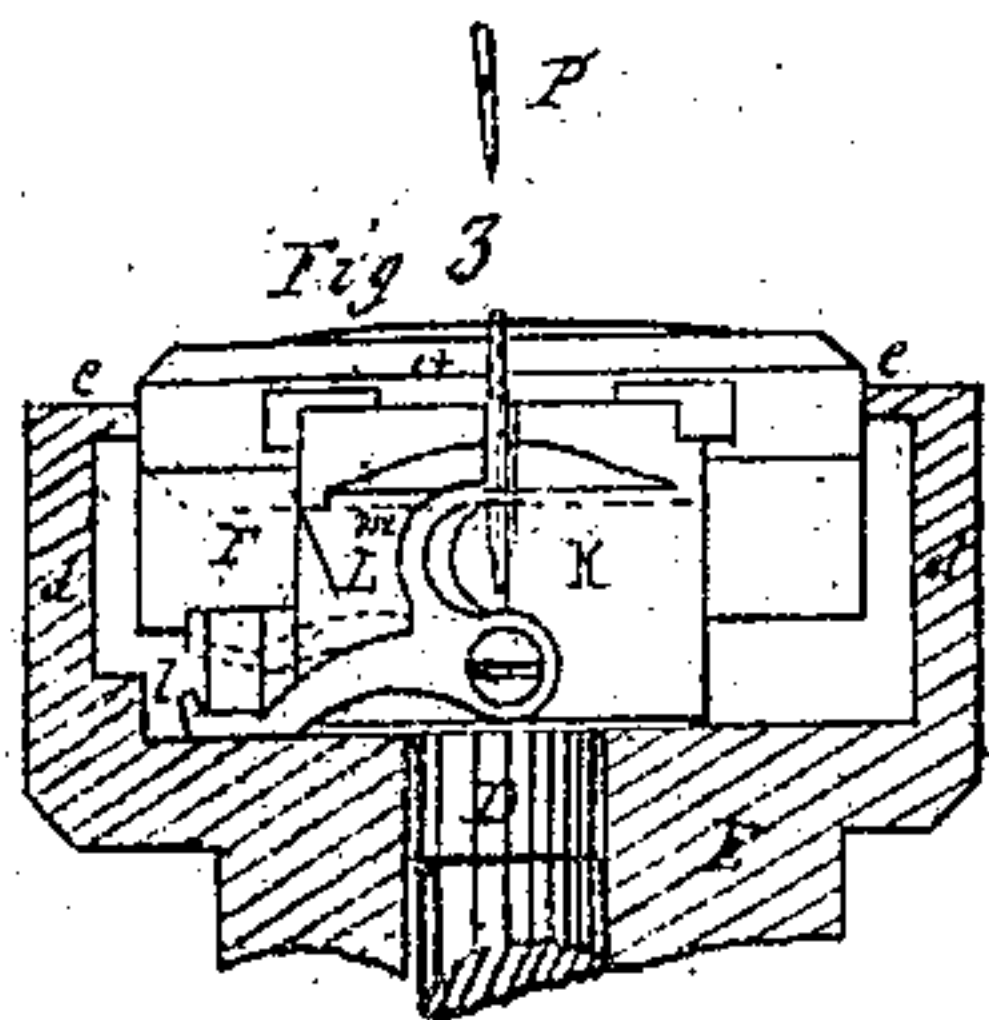
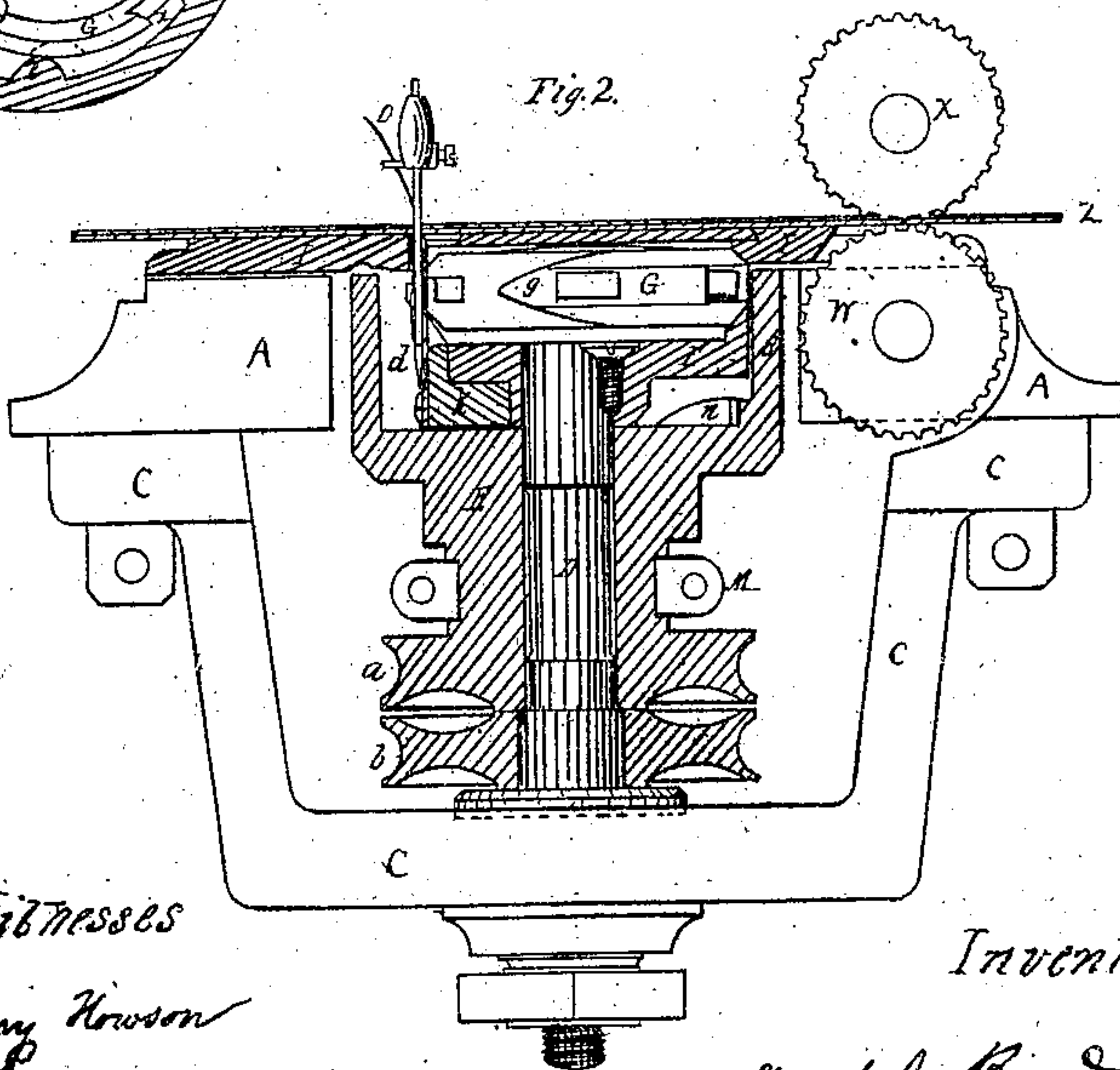


Fig. 2.



Witnesses

Henry Howson
Frederic Bergner

Inventor:

Joseph Bond Jr.

UNITED STATES PATENT OFFICE.

JOSEPH BOND, JR., OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 15,470, dated August 5, 1856.

To all whom it may concern:

Be it known that I, JOSEPH BOND, Jr., of the city of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to improvements in sewing-machines, for which a patent was granted to me on the 17th day of May, 1855; and it consists in driving a spool-case, somewhat similar to that described in the patent referred to, by placing the same on a stationary holder within a cylindrical driver, the latter being eccentric with the former. In the cylindrical driver are teeth which, as the same revolves, catch alternately into recesses on the edge of the spool-case, causing the latter to revolve, and at the same time allowing sufficient room for the movements of the needle and its thread.

My invention further consists in connecting a lever to the stationary spool-case holder in such a manner that by the action of a cam in the driver on one arm of the said lever the other arm, which is hooked, catches the needle-thread, and holds the same while it is carried over the spool by means of the nose on the latter, the thread being released from the hook when the spool-case is in a proper position for the loop to escape. The whole is so arranged and constructed as to simplify the mode of driving the spool-case described in the patent alluded to, reducing the friction, and allowing the machine to be driven at a greater speed and with less liability to break the thread.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the drawings, which form a part of this specification, Figure 1 is a side view of a sewing-machine, showing in section my improved mode of driving the spool-case. Fig. 2 is a transverse section of Fig. 1 through the center of the driver, and looking at the front of the machine; Fig. 3, the same of a portion of the top of the driver, and looking toward the back of the machine. This view shows my improved arrangement of

hooked lever for retaining the loop. Fig. 4 is a ground plan of the top of the driver and spool-case, with the nose of the latter about catching the needle-thread; and Fig. 5, the same with the spool-case in a different position.

The same letters of reference allude to similar parts throughout the several views.

A is the base of the machine; B, the framework secured thereto.

Underneath the front of the base is bolted the bracket C, to the bottom of which is secured the vertical shaft D. This remains stationary during the operation of the machine.

E is the driver, arranged to run loose on the shaft D. On the bottom of this driver, and forming part of the same, is the pulley *a*, for receiving a cord from the fly-wheel turned by the foot of the operator. A second pulley, *b*, detached from the driver, runs loose on the shaft D and receives the driving-cord when the operator wishes to stop the machine.

On the top of the driver E, and forming part of the same, is the cylindrical box *d*, on the upper end of which, and projecting from the inside, are any convenient number of teeth, *e*. On the top of the stationary shaft D is secured the spool-case holder F, with beveled edges for receiving the similarly-shaped edges of the spool-case G. It will be observed that the spool-case holder F, with its spool-case G, is placed eccentrically with the cylindrical portion *d* of the driver E. The spool-case has a series of curved recesses on its edge corresponding in number to that of the teeth *e* on the driver, and also on the same edge a nose, *g*, for catching the loop of the needle-thread. Between the nose *g* and the point *x* on the spool-case the latter is recessed, for a purpose seen hereinafter. The spool rests with its upper flange in a recess on the top of the spool-case, the detents *r* serving to prevent one from turning without the other.

Below the under flange of the spool is a projection, *f*, on which the radial arm *h* is allowed to turn independently of the spool, and above this arm *h* is a second arm meeting the first at the ends, both arms together forming an elliptical spring, which may be more or less compressed by a screw on the end of the projection *f*. This arrangement gives to the arm *h* a friction against the bottom of the spool to an

amount regulated by the screw. The spool-thread is wound onto the spool between the two flanges, and passes from the same through a hole in the radial arm *h* toward the center of the spool, and upward through the latter toward the fabric to be operated upon.

I is a plate secured to the base A and having a circular opening, the beveled edges of which bear against the beveled edges of the spool-case G, which is thus confined so as to revolve freely, but to have no vertical movement.

J is a plate dovetailed into the plate I, so as to slide easily in the same, and thereby allow the spool to be examined and withdrawn from its case at pleasure.

On one side of the spool-case holder F is secured the piece K, the top of which reaches to about the middle of the spool-case, and then projects outward, the projecting part being divided by a slot for the purpose of admitting the needle P.

In front of the piece K, and between it and the needle, (when the latter is down,) is the lever L, allowed to vibrate on a pin screwed into K. One arm, *l*, of this lever rests on the bottom of the cylindrical box *d* of the driver E when not raised therefrom by the incline of the cam *n*, which forms a part of the driver. The other arm, *m*, of the lever L is hooked, so as to catch the needle-thread above the eye of the needle. A spring, *o*, serves to keep the arm *l* of the lever down when not raised by the cam *n*. A portion of the driver E is turned eccentrically with the shaft D to receive the clip M, which is jointed to the rod N, the other end of the latter being connected by means of a ball-and-socket joint to the lower end of the bent lever O, which has its fulcrum on a pin in the base A. The extreme end of this lever is furnished with a needle, P, similar to that of ordinary sewing-machines, and with a small projection, *s*, having an orifice for guiding the needle-thread.

Q is a rod connecting the needle-lever O to the auxiliary lever R, the latter having its fulcrum on a projection from the frame-work B, and having its end turned down and furnished with a hole, through which the needle-thread passes.

S is a spool containing a supply of needle-thread. This is allowed to turn loose on a pin attached to a bracket on the frame-work. A spring, T, likewise attached to the frame-work and regulated by the screw V, bears against a circular projection on the end of the spool S, and gives a slight friction to the latter as the thread is being drawn off. X is a roller with serrated edges, and turning loosely on a pin on the end of the base. Immediately above this is a second similar roller, W, on the spring-handle Y. The roller X is caused to turn by levers and catches, which may be arranged and driven in various ways, and which, as forming no part of my invention, are omitted in the drawings. By means of the two serrated rollers the fabric Z is drawn forward at

a rate corresponding to the length of the stitch required, and to the speed of the machine.

Operation of the machine: The driver E being caused to revolve by the cord from the fly-wheel, the teeth *e* on the top of the cylindrical portion *d* of the driver will, on account of the eccentricity of the latter with the stationary shaft D, enter the recesses of the spool-case, as seen in Figs. 4 and 5, two teeth only being in the said orifices at one time, the other teeth, as the driver revolves, clearing the piece K, as well as the needle P, thus causing the spool-case to revolve within its holder, and at the same time leaving ample room for the operation of the needle and the lever L, as hereinafter described. As the driver E revolves, the eccentric clip M, by means of the rod N, operates the needle-lever O, and at the same time, through the rod Q, the auxiliary lever R. In the machine as shown in Fig. 1 the needle is at its extreme height, and the auxiliary lever down at its lowest point has given out the requisite slack of needle-thread to the spool-case, the latter being in the position shown in Fig. 5—that is, with its nose *g* farthest from or on the opposite side of the needle, and the arm *l* of the lever L resting on the highest point of the cam *n*, and consequently the hooked end *m* across the needle-slot in the piece K, as shown in red, Fig. 3. At this position of the machine the needle-thread is caught on the hook *m* of the lever L, passing under the spool-case through the recess between the nose *g* and point *x* on the same, and over the top of the spool-case through the needle-orifice in the plate I to the fabric. Now, supposing the needle P to have commenced its descent, simultaneously with which the auxiliary lever R has begun its ascent, and the nose *g* approached the needle-slot in the piece K. During this movement the needle-thread, previously over the top of the spool-case, must become slack, and this slack is taken up by the ascent of the auxiliary lever R. The needle having descended to its lowest position, the lever L, previously in the position shown in red, Fig. 3, now through its arm *l* being released from contact with the cam *n*, assumes the position shown in black, with its hooked arm *m* drawn back, thereby releasing the loop which was previously drawn round it. In this position of the machine the nose *g* is yet an eighth of the circumference of the spool-case distant from the needle, and in such a position as to allow the loop to escape and be drawn up by the auxiliary lever R tight toward the fabric. The original loop having now been disposed of, a second loop begins to be formed by the needle commencing to rise, and as the needle thus rises the nose *g* catches this partially-formed loop, and the hook *m* of the lever L is by the cam *n* projected into the same loop. The needle continues to rise until it regains its former elevated position, and during this continued movement of the needle the thread is carried round to the position shown in Fig. 5, being the point from which we started, when a repe

tition of the foregoing movements takes place. The spool-thread passes from the spool to the end of the radial arm *h* through a hole in the end of the latter, thence toward the center of the spool through an orifice in the same to the top of the spool-case, and thence through the needle-hole in the plate *I* toward the fabric to be operated upon, where, in conjunction with the needle-thread with which it has become interlaced, it completes the stitch.

It will now be seen that by the above arrangement I dispense with the elliptical driving-wheels and external teeth on the spool-case described in my specification of the patent granted to me on the 17th day of May, 1855. In the present machine the spool-case has a regular rotary motion and the needle-lever a regular reciprocating motion without any dwells or hesitations, as in my former machine. Thus I am enabled to drive the present machine much faster with considerably less friction and with less liability to break the threads. At the same time the original cost of the machine is much less, on account of its simplicity, than the former.

What I claim, and desire to secure by Letters Patent, is—

1. The driving of the spool-case *G* by placing the latter on a stationary spool-case holder within a cylindrical driver having any convenient number of internal teeth, the driver being situated eccentrically with the holder, so that the internal teeth of the former may catch into the recesses in the edge of the spool-case and cause the same to revolve, at the same time leaving a space between the holder and the driver on the side opposite to that where the teeth act on the spool-case for the play of the needle and its thread.

2. The hooked lever *L*, in combination with the cam *n* on the driver *E*, arranged and operating substantially in the manner and for the purpose set forth.

JOSEPH BOND, JR.

Witnesses:

HENRY HOWSON,

THEODORE BERGNER.