2 Sheets—Sheet 1.

A. B. HOWE.

Sewing Machine.

No. 37,913. Patented March 17, 1863.

Fig: 2.

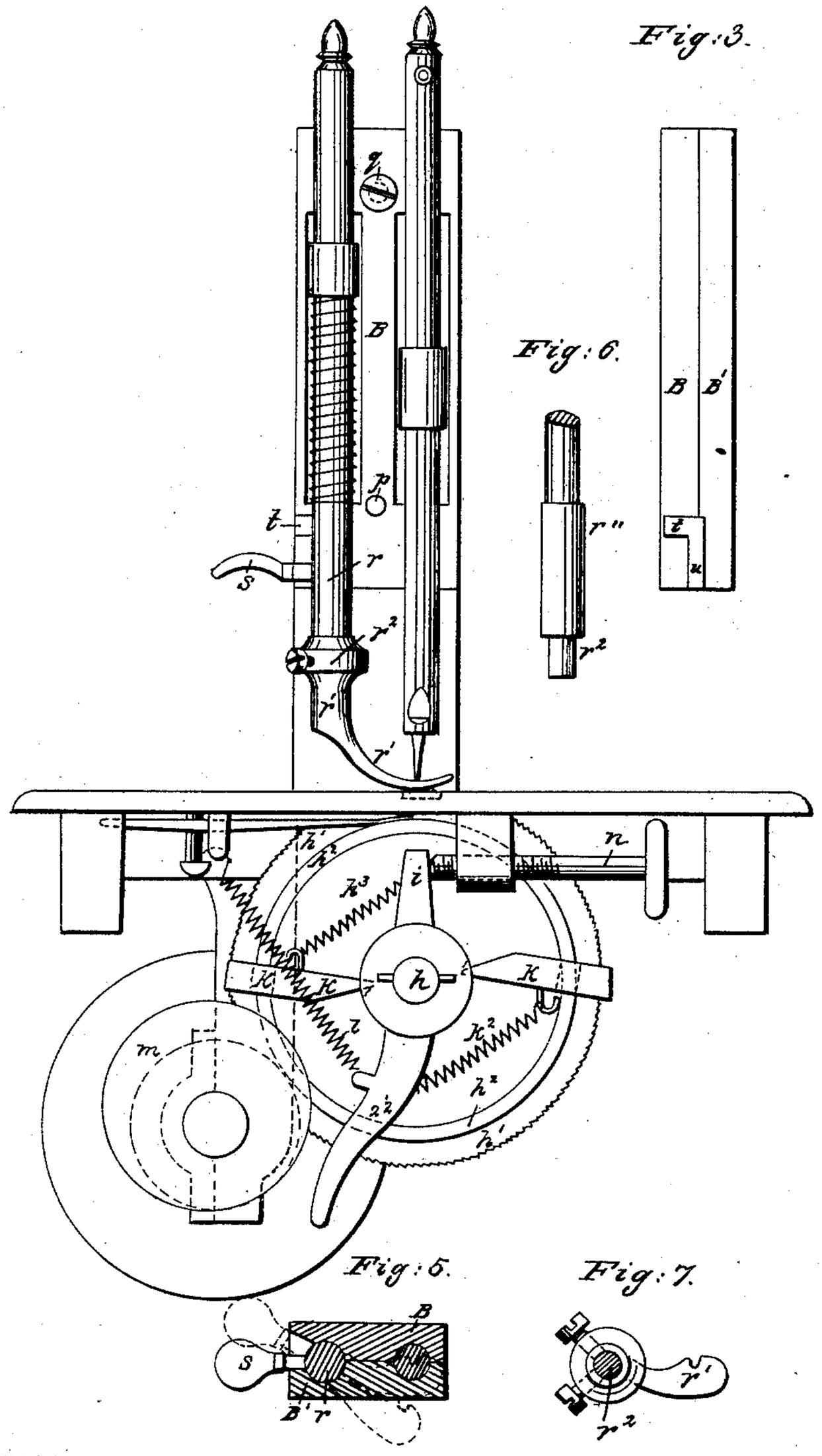

Fig: 3.

Fig: 6.

Fig: 5.

Fig: 7.

Witnesses:

W. B. Lasnell.
L. H. Hammmm.

Inventor:

A B Howe.

2 Sheets—Sheet 2.

A. B. HOWE.

Sewing Machine.

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Fig: 4

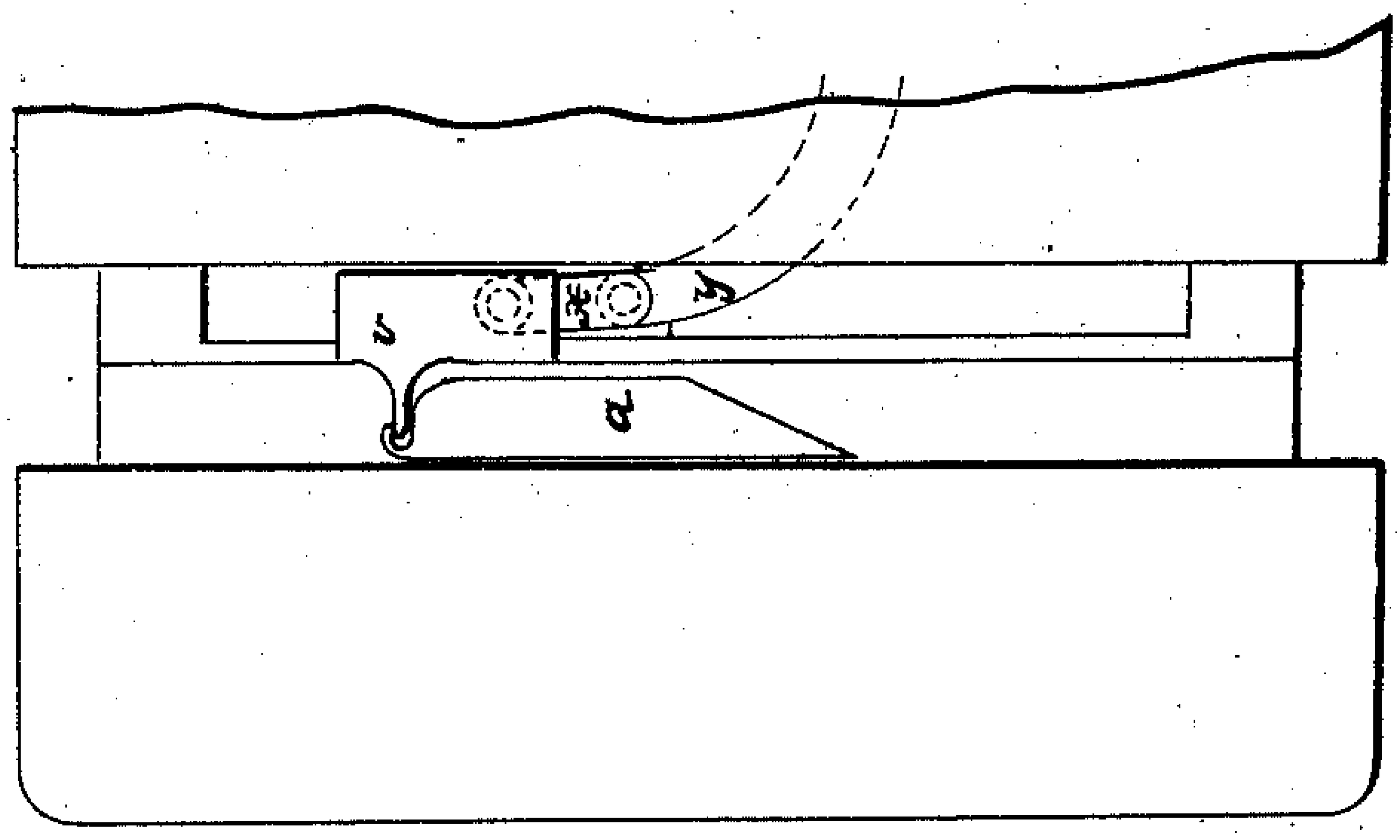
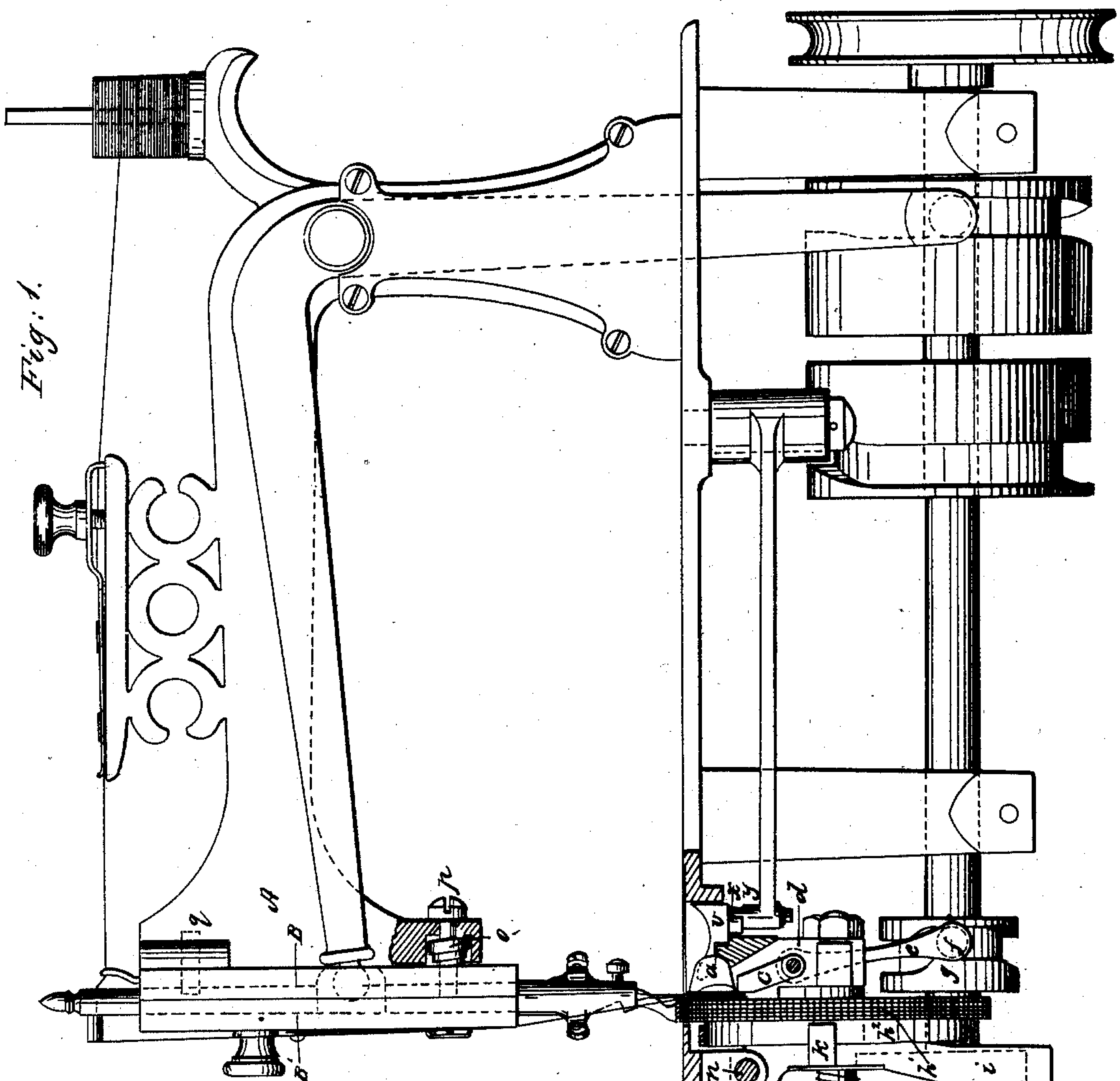


Fig: 1



Witnesses:
H. B. Lassell
C. M. Hammer

Inventor:
A B Howe

N. PETERS. Photo-Lithographer. Washington. D. C.

UNITED STATES PATENT OFFICE.

AMASA BEMIS HOWE, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **37,913**, dated March 17, 1863.

To all whom it may concern:

Be it known that I, AMASA BEMIS HOWE, of the city, county, and State of New York, have invented new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

The improvements which I have invented are applicable to nearly all the different kinds and forms of sewing-machines now manufactured; and they relate, first, to an adjustable needle or needle-bar box, by which the needle, whether coarse or fine, can be readily adjusted and made to operate in any required proximity to the shuttle-race, shuttle, hook, or other device used for securing the loop of the needle-thread. In order to accomplish this very desirable object, I construct the needle-bar box separate from the stationary arm or post which supports the needle-arm.

In the drawings, Figure 1 shows a side view of the machine; Fig. 2, an end view with the cap of needle-bar box removed; Fig. 3, the needle-bar box detached. Figs. 4, 5, 6, and 7 show particular parts of the machine, which I will presently describe.

Fig. 1, A is the frame which supports the needle-arm. B and B′ is the needle-bar box, which I prefer to construct in two parts, vertically in the line of the needle-bar. B, which I will call the "bed" of the needle-bar box, is held to the frame A by the screw *q* near the top. At the bottom of the frame or arm A, I drill or countersink a recess, in which I place a strong volute spring, *o*, having a resisting power of one or two hundred pounds. I then pass a screw, *p*, through the arm A and the spring *o* into the bed-piece B. The needle-bar and pressure-bars are now to be placed in position, as better shown in Fig. 2. The cap B′ is firmly screwed to the bed B. Now, by turning the screw *p* in one direction the needle-bar box will be drawn against the spring *o*, thereby bringing the needle to any required proximity to the shuttle-race, shuttle, hook, or other device used for securing the loop of the needle-thread. No adjustment of the screw *q* is required when the position of the needle is to be changed.

I do not limit this part of my invention to the exact mechanism described, as the spring may be dispensed with and counter set-screws may be inserted from the opposite side of the needle-bar box, which would require the use of two or three screws to obtain a proper adjustment.

In order that the loop of thread formed by the action of an eye-pointed needle be properly presented to the loop-securing device, it is essentially necessary that the needle should play or move as closely to the loop-securing device as possible, and that the needle and loop-securing device do not come in contact with each other. When these two essentially requisite parts of a sewing-machine are thus nicely adjusted the machine will be found to work well, and not liable to miss or drop stitches on thin and plain fabrics; but in crossing seams and in sewing fabrics of firm or uneven texture there will be great liability of the needle being deflected across the line of action of the loop-securing device, when one or both will be broken and the machine materially deranged.

The second part of my invention relates to a device for counteracting the lateral deflection of the needle just described. This device is shown in Fig. 1 of the drawings at *c*, *d*, *e*, *f*, and *g*, in which *c* is a vibrating lever, *d* being its center of motion, and it is operated by the cam *g*. When the needle has descended and carried its loop of thread through the fabric it then slightly recedes in order to form and present its loop to the loop-securing device, which in the drawings is a shuttle. The cam *g* is so set on its shaft that after the loop-forming motion of the needle has taken place it will cause the upper end of the lever *c* to move toward the needle, which, if deflected into the shuttle-race, will be pressed back again by the clip *c* before the shuttle advances, and I prefer that the clip *c* hold the needle in that position until the shuttle has passed entirely through the needle-loop, thus preventing the shuttle from touching the needle while passing through the loop, as practice and experience have shown that where much tension is required on the needle-thread the needle will be drawn against the shuttle, causing both needle and shuttle to become worn and abraded.

The practical results of these two improvements, so far as I have been able to test them, are that not one-tenth part of the number of

needles are broken, and none are broken by the needle and shuttle coming in contact, and the liability of missing or dropping stitches is vastly lessened, while much finer needles can be used than without these improvements.

The third part of my invention relates to an adjustable and detachable presser-foot or cloth-holder, which is shown in Figs. 1, 2, 6, and 7.

In sewing-machines intended for sewing thick and thin or light and heavy work, or using fine and coarse needles, an adjustment of the foot or cloth-holder is required, and frequently a change in the form of the foot. These objects are readily accomplished by the part of my invention now to be described.

Fig. 6 is a section of the presser-bar reduced or turned smaller, with a shoulder at r^2. This section of presser-bar has the foot detached. The foot or cloth-holder, Fig. 2, r' r', is made with a socket and boss, through which two screws are passed, which impinge upon the reduced part of the presser-bar at r^2. By this arraugement the presser foot can be turned and placed to any required proximity to the needle, while at the same time it can readily be detached and another of any desired form as readily adjusted in its place.

Fig. 7 is a top or plan view, showing the presser-foot and the screws for holding it, with the presser-bar cut off at the point where it enters the socket of the presser-foot.

The fourth part of my invention relates to the feeding apparatus, a side view of which is shown in Fig. 1 and a plan view in Fig. 2.

For moving the fabric I employ the well-known serrated feed-wheel. At about one-fourth of an inch inside of it speriphery, and concentric with its serrated surface, I form a flange, h^2, projecting about one-fourth of an inch. i i^2 is a vibrating lever, its center of motion being at h, which is a stationary shaft or stud on which the feed-wheel and lever are attached and move. Recesses or steps are cut in the vibrating lever near its center of motion. Into these recesses or steps small wedge-shaped pieces of metal k are stepped, which I call "clutches." They have a slot cut in the side next to the feed-wheel, exactly fitting the flange h^2, but being free to move upon it. These clutches are connected to the vibrating lever by the spiral springs k^2. The vibrating lever is connected to the bed-plate of the machine by the spiral spring l, and is made to vibrate by the rotary motion of the eccentric m and spring l. When the eccentric m impinges upon the lever i^2 its power and movement are communicated to the clutches k, which take hold of or grip the flange h^2 of the feed-wheel, moving it the required distance, which distance is governed by the set-screw n, against which the upper end of the lever i is drawn by the spring l. The springs k^2 have no vibratory motion, their office being only to bring the clutches into position again on the flange after it has been moved the requisite distance. The action and power of the lever i i^2 and the clutches k are that of compound levers. The clutches are the only part in the feeding mechanism liable to wear, their cost is but trifling, and as they are not attached to the other parts of the feeding mechanism the most inexperienced operator can remove them and substitute others in their places.

Having thus fully described the improvements which I have invented, what I claim, and desire to secure by Letters Patent, is—

1. In combination with the needle-bar box B B′, the screw p and the spring o for adjusting and controlling the proper adjustment of said needle-bar box and the needle-bar and needle therein, substantially as described.

2. In combination with the needle, the clip or arm c of the lever c d e f, and the cam g for bringing the needle into proper position should it be deflected by any cause, the whole operating in the manner and for the purpose substantially as described.

3. The combination of the adjustable needle-bar box with the clip c and its operative parts, substantially as described.

4. The arrangement of the compound levers and their action upon and with the feed-wheel, as herein described and shown.

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Witnesses:

W. B. LASSCUE,

L. M. HAMMON.