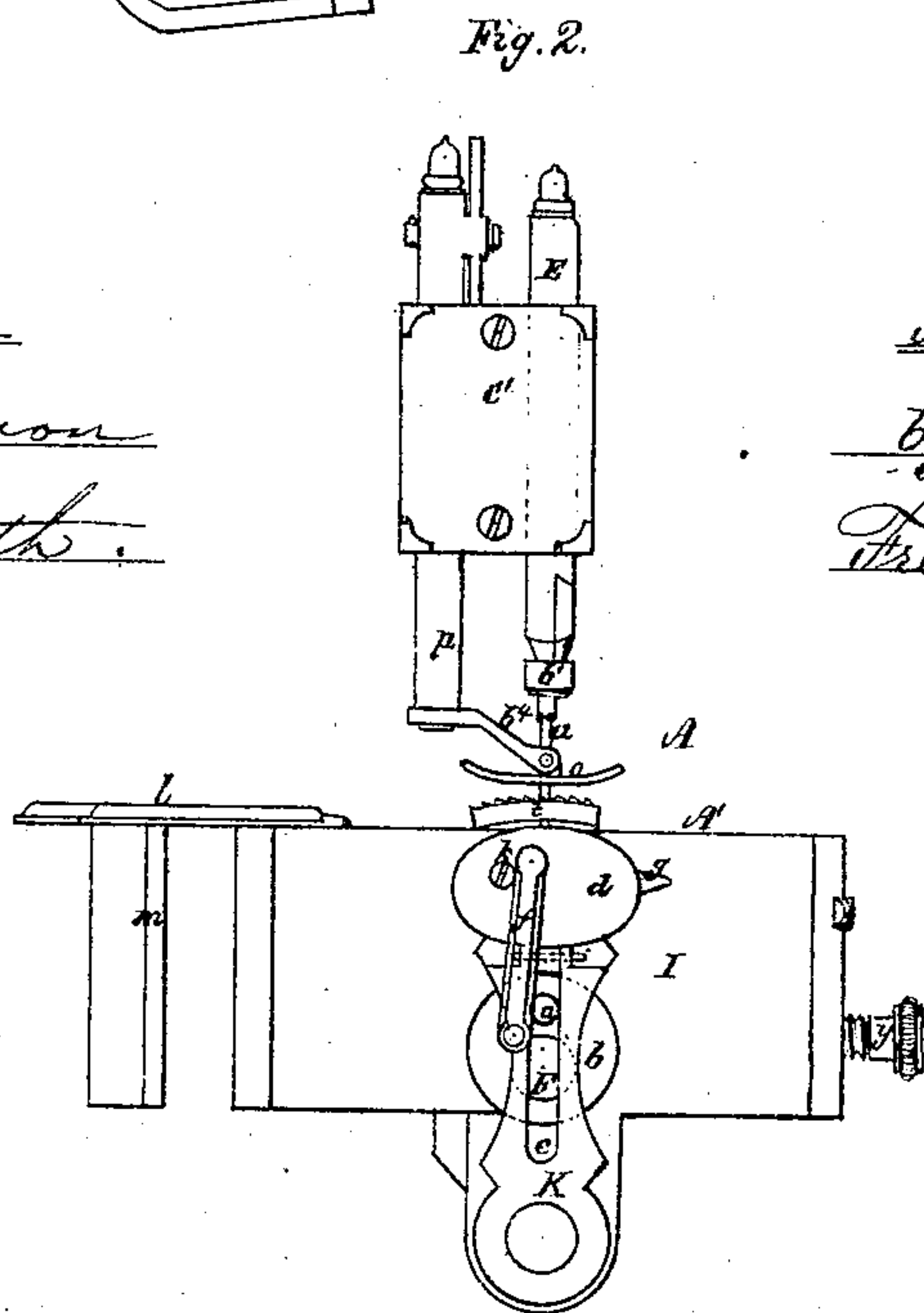
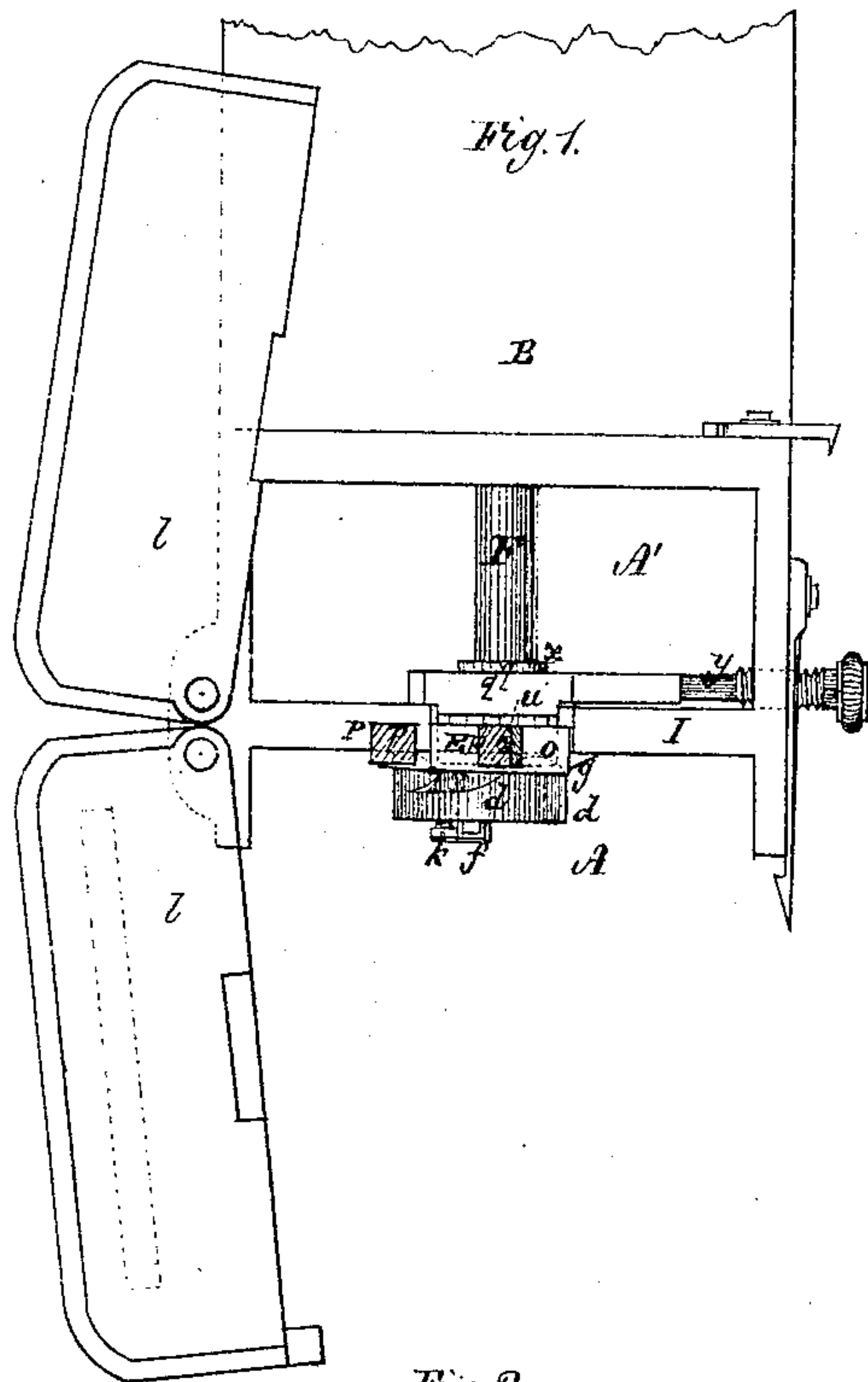


A. BINGHAM.
Sewing-Machines.

No. 135,194.

Patented Jan. 28, 1873.



Witnesses.

Chas. C. Damon
Edw Griffith.

Albert Bingham.

By his attorney
Frederick Curtis.

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Fig. 3.

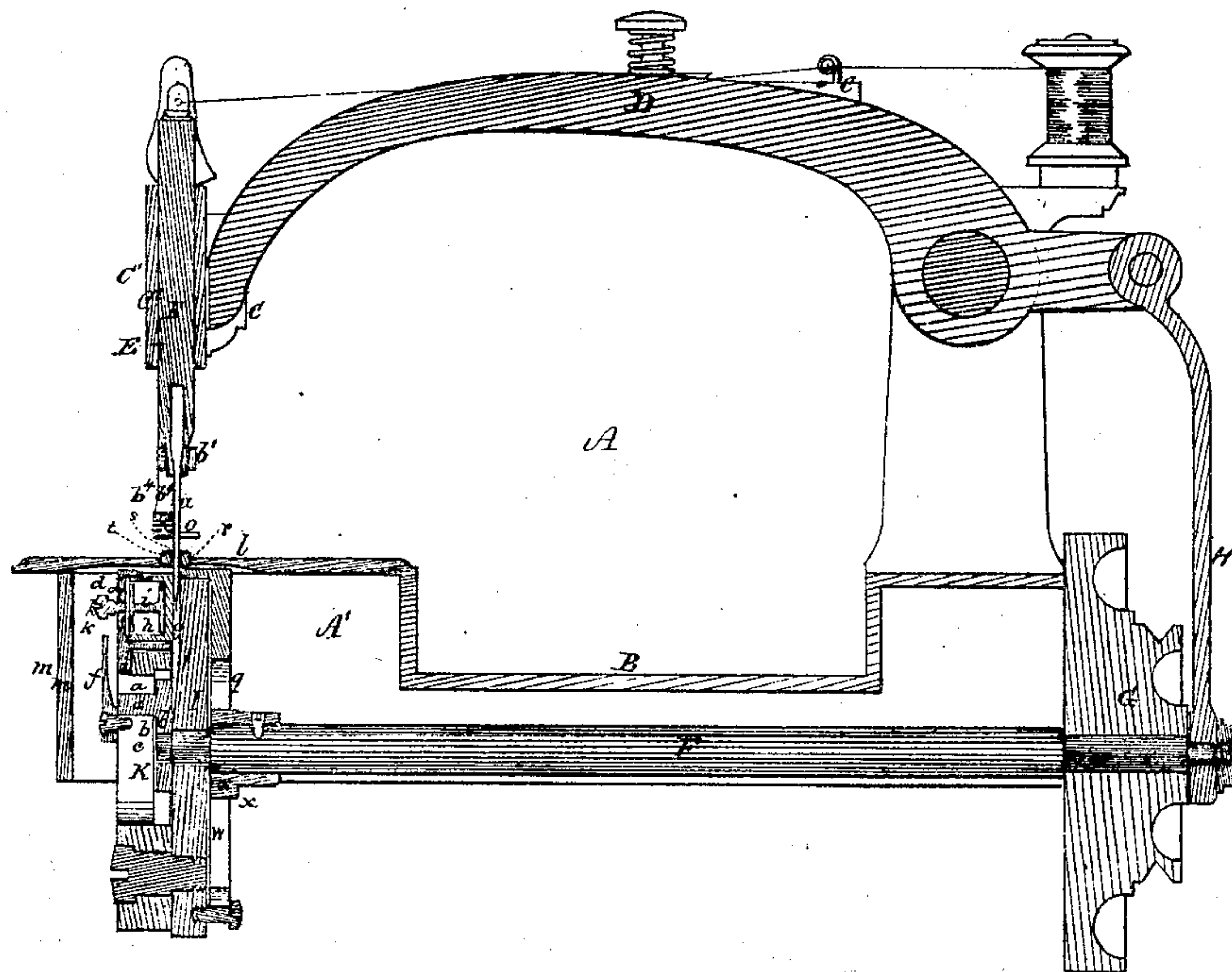


Fig. 4.
Enlarged.

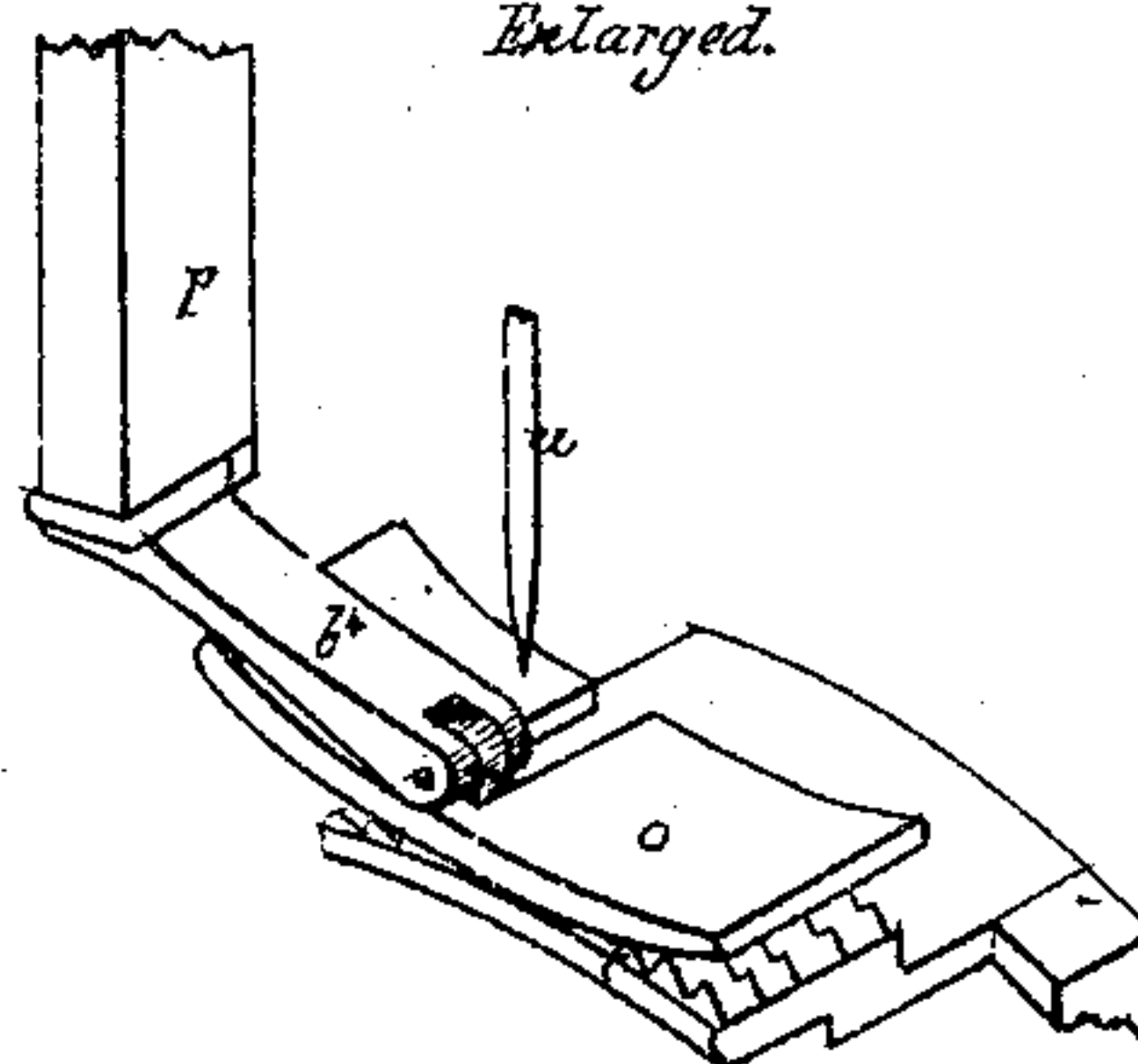
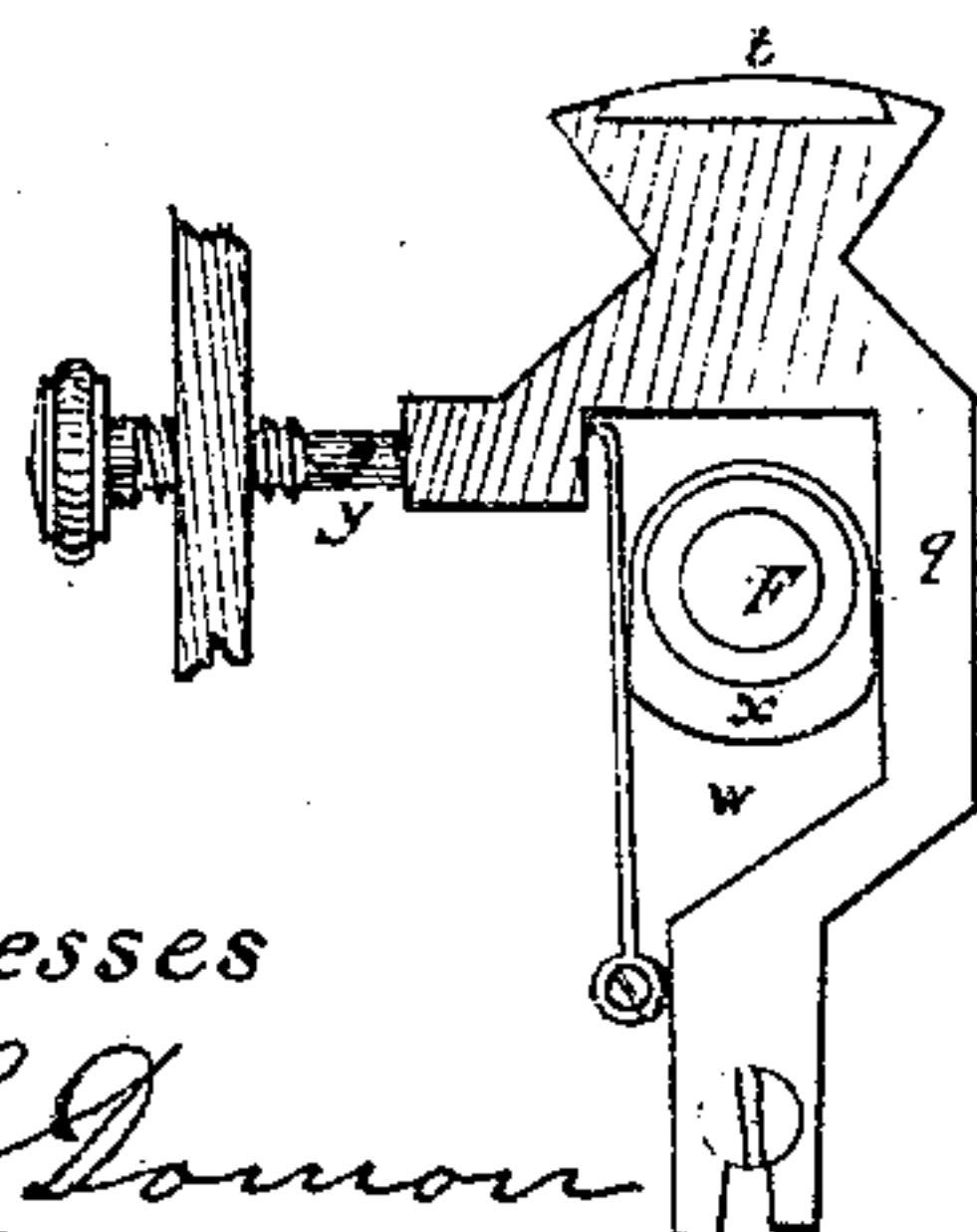
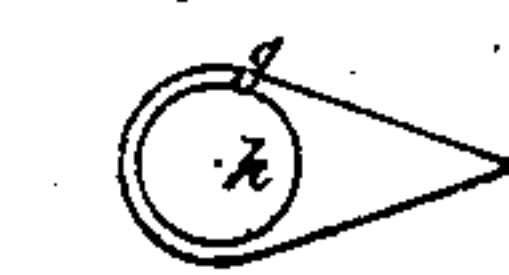


Fig. 5
Enlarged.



Plan of Shuttle.



Plan of Needle.



Witnesses
Chas E. Damon
Edw Griffith

Albert Bingham
by his attorney
Frederick Curtis

UNITED STATES PATENT OFFICE.

ALBERT BINGHAM, OF NEWTONVILLE, ASSIGNOR TO FREDERICK CURTIS,
OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 135,194, dated January 28, 1873.

To all whom it may concern:

Be it known that I, ALBERT BINGHAM, of Newtonville, in the county of Middlesex and State of Massachusetts, have made an invention of certain Improvements in Sewing-Machines; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawing making part of this specification, and in which—

Figure 1 is a plan; Fig. 2, a front-end view; Fig. 3, a vertical and longitudinal section; and Fig. 4, an under-side view, of a sewing-machine containing my improvements. Fig. 5 is a rear or inner side elevation of its feeding device.

The drawing accompanying this specification represents at A a sewing-machine, of which B is the main bed or table, provided at its front end with an elevated box or chamber, A'; C, the arched standard or goose-neck; C', the head of the latter; D, the curved operating-arm driving the needle-carrier E, which is pivoted to it in the usual manner; F, the driving-shaft; G, the fly crank-wheel; and H, the pitman which connects such wheel with the needle-operating arm—these constituent elements being organized after the manner of several machines now in use, and containing in themselves nothing peculiar to myself. The box A' or working-head of the machine is divided near its outer end by a vertical wall, I, the outer face of this wall being scored with a perpendicular channel, J, which receives the needle during its traverses, this arrangement of wall and needle serving to insure the correct position of the loop of thread in order that the shuttle shall enter it. K represents an upright vibrating arm swiveled to the lower part of the wall I, and which travels to and fro against the front face of such wall, its vibrations being produced by the stud *a* of a crank or eccentric, *b*, which is mounted upon the outer end of the driving-shaft F, such stud extending into a vertical slot, *c*, formed in the vibrator, as represented.

In carrying out the first portion of my invention in the order above premised, I pivot to the upper end of the vibrator or shuttle-carrier K a box or shuttle-case, *d*, which is open in rear and travels closely against the face of

the wall I, this wall serving to close it and secure the shuttle in place within it, a notch or aperture, *e*, being created in the top of the box or cradle for exit of thread therefrom. A spring turn-button, *f*, is applied to the front of the vibrator K, and in connection with the shuttle-case or cradle *d*, in such manner that when turned upright in contact with the latter it serves to firmly retain it in its working position, and when turned away from contact with such shuttle-case it permits it to be turned over into a horizontal position, and thus expose its shuttle, which may at once be removed without inconvenience. This button possesses sufficient elasticity to insure close contact of the shuttle and wall, and yet is of sufficient strength to insure such a friction between the two as shall suffice to exert the proper tension upon the thread of the bobbin, as hereinafter explained. The shuttle is shown at *g* as an elongated, pointed oval block in its longest direction, and provided with an inclosure or chamber, *h*, for receiving the bobbin, which is shown at *i* as a spool of ordinary form, the mouth of this spool-chamber, when the shuttle is in working position, being outward, but covered by the shuttle-case, and being formed with an orifice at the top for exit of thread. The friction or drag upon the rotations of the bobbin, which is necessary to produce the requisite tension upon the thread carried by such bobbin, is obtained by means of a simple screw, shown at *k* in the accompanying drawing, which is screwed through the base or outer side of the shuttle-case, extends into the mouth of the shuttle, and abuts against the end of the bobbin; by this means pressing the rear side of the shuttle against the wall I and creating a greater or less amount of friction between the bobbin and such wall through the agency of the intervening shuttle, according to the extent to which the screw is advanced, a pad of leather or its equivalent being interposed between the screw and bobbin. This arrangement of the vibrator K, shuttle-box *d*, shuttle *g*, and bobbin *i*, in combination with the wall I, constitutes an extremely simple and effective device whereby the tension upon the shuttle-thread is easily and expeditiously effected without disturbing any of the working parts of the machine or re-

moving the bobbin. The same organization of parts enables a shuttle to be removed with equal dispatch and ease.

Should it be found, in practice, that the friction existing between the shuttle and wall I is of sufficient extent to wear the parts, I have provided a remedy, which consists in passing a post or wire through the bobbin *i* and screwing the end of the same into the body of the shuttle, the head of this screw overlapping the end of the bobbin, and, by means of an interposed elastic washer or spring, exerting the necessary friction upon such bobbin, according to the power with which it is screwed against it. An orifice should be formed in the outer face of the shuttle-case or cradle in coincidence with the head of the screw, in order that a screw-driver may be applied thereat, and the tension upon the bobbin varied, without removing the same or its shuttle. Second, in order to expose the sewing mechanism of the machine by the dismemberment or division of its sewing-table, I divide the sewing or working plate *l* of such table in a line coincident with the path of the feeding mechanism, and so as to diverge upon opposite sides thereof, and I hinge each half of such plate at their rear adjacent corners to the rear side of the box *A'* in such manner that they may be separated and swing away from each other, and from over the working parts contained within the said box, in order to expose such working parts and enable ready access to be had to them for the purpose of adjustment, removal of the bobbin, lubrication, &c. That this object may be more effectually accomplished, I secure the outer side *m* of the box *A'* to the outer portion of the plate *l*, and so as to produce a door which shall move with it and away from before the shuttle-carrier and other devices, as shown in Fig. 2 of the accompanying drawing, each half or semi-plate being provided with a suitable spring-catch to secure them in place when closed. Third, I hinge the presser-foot, shown in the drawing at *o*, in a peculiar manner to its carrier or bar *p*, which is contained within the head *O'* in the usual manner; this mode of attachment of the presser-foot, in contradistinction to the rigid connection as used at present, enabling it to accommodate itself to and surmount seams and irregularities in the work, and permitting such seams to advance immediately to the needle before seizure by the feed—these peculiarities having proved themselves to be of great utility and value in producing a series of uniform and perfect stitches.

The peculiarity of this attachment of the presser-foot consists in swiveling it to its carrier by means of a lateral arm, *b⁴*, or its equivalent, in such manner that its center of suspension and oscillation shall be directly opposite the center of the needle or its path of movement, thus at all times exerting a hold upon the material immediately about such needle.

In the employment of a rigid and flat presser-foot, as now generally adopted, as a seam

or ridge in the cloth approaches the needle the presser-foot is elevated and the cloth immediately about the needle left without a means of holding it down upon the feed; hence the elevation of the needle raises this portion of the cloth with it, and, by disarranging the lower thread, prevents the proper presentation of the loop to the nose of the shuttle, and allows the shuttle to fail in producing a stitch.

By my construction of feed and presser foot a pressure is exerted upon the cloth immediately about the needle, thus keeping it at all times in proper position. As the needle, remains in the cloth while the feed is being retracted to take a new hold thereupon it securely holds the cloth in place and prevents the wrinkles and misplacement which would ensue were the cloth left unsupported, the slot in the feed permitting such feed to travel past the needle without interfering with it.

The feeding mechanism consists of a sectoral plate, *q*, pivoted, at its lower extremity, to the bottom of the inner face of the wall I and opposite the shuttle-carrier K, the said sectoral plate extending upward through an orifice, *r*, in the sewing-plate before mentioned, and provided with a lateral offset, *t*, which overlaps the wall I, and being of sufficient thickness to monopolize the entire width of such orifice, the upper edge of this sectoral plate constituting a means whereby the material is fed along below the presser-foot, a vertical channel, *s*, being formed centrally and longitudinally through its offset *t* for passage of the needle, such needle being shown at *u* in the drawing.

As the feeding device last explained embraces closely each side of the needle, or its path of movement, without any intervening object, and seizes the material only in the immediate locality of such needle, I am enabled to more effectively and unerringly insure the advance of such material, and as a consequence improve the character of the stitches produced by the machine. The convex form of the upper and serrated face or feeding-face of the plate *q* acts, in combination with the curved presser-foot before explained, to facilitate the introduction and feeding as well as support of the material, and possesses features and advantages incident to such a presser-foot. The sectoral plate *q* is formed with an irregular fork or opening, *w*, which embraces or straddles an eccentric or cam, *x*, fixed to the driving-shaft of the machine, such cam during a revolution striking in succession against the rear side of such fork, which advances the feed and the material, and the front side of such fork which retracts the feed, such front side being elastic or yielding in order that the cam may pass it when a very short stitch is being laid, this yielding side, however, being sufficiently rigid to insure the retraction of the feed. The extent of movement of the feeding-plate, and consequently the length of the stitch governed by such

feed, is regulated by a stud or rod, *y*, which is screwed through the front wall of the box *A'* and into the path of movement of the feeding-plate.

Claims.

1. The combination of the vibrating shuttle-box carrier, the shuttle-box hinged to said carrier, and the spring-latch for holding said carrier with a yielding pressure against the wall *I* during the vibrations of the carrier, substantially as and for the purposes set forth.

2. The herein-described combination of the vibrator *K*, shuttle-box *d*, turn-button *f*, shuttle *g*, bobbin *i*, and screw *k*, when constructed and operating as described.

3. In combination with the vibratory shuttle-carrier and shuttle-box and the feeding mechanism arranged on opposite side of the wall *I*, as shown and described, the divided sewing-plate, the one part covering and surrounding the shuttle and its operating mechanism, the other part covering the feeding mechanism, and both parts hinged separately and independently to the machine, as and for the purpose set forth.

4. The combination of a curved presser-foot hinged to its operating-bar, so that its point of oscillation shall be in a vertical plane passing through the needle at right angles with

the line of feed, and a convex-surfaced and vibratory feed having its point of oscillation in the same vertical plane with that of the presser-foot, said parts being constructed and arranged to operate with each other and the needle as shown and set forth.

5. In combination with the screw *y*, or its equivalent, attached to the frame of the machine and operating to regulate the feed, as described, the feed yoke or frame provided, upon that side with which the feed-cam is in contact when retracting the feed-plate, with a yielding face, which, after the cam has retracted the feed to the extent permitted by the regulating-screw will yield and thus allow the cam to pass it and complete its rotation, substantially as shown and described.

6. The combination, with the vibratory shuttle-box and the shuttle and bobbin, constructed and arranged to operate in connection with the wall *I* as specified, of the means, substantially as herein shown and described, for clamping said bobbin with a greater or less pressure against the wall in rear of the needle, for the purposes set forth.

ALBERT BINGHAM.

Witnesses:

FRED. CURTIS,

EDW. GRIFFITH.