(No Model.) 4 Sheets—Sheet 1.

G. S. ROMINGER.

SEWING MACHINE.

No. 256,743. Patented Apr. 18, 1882.

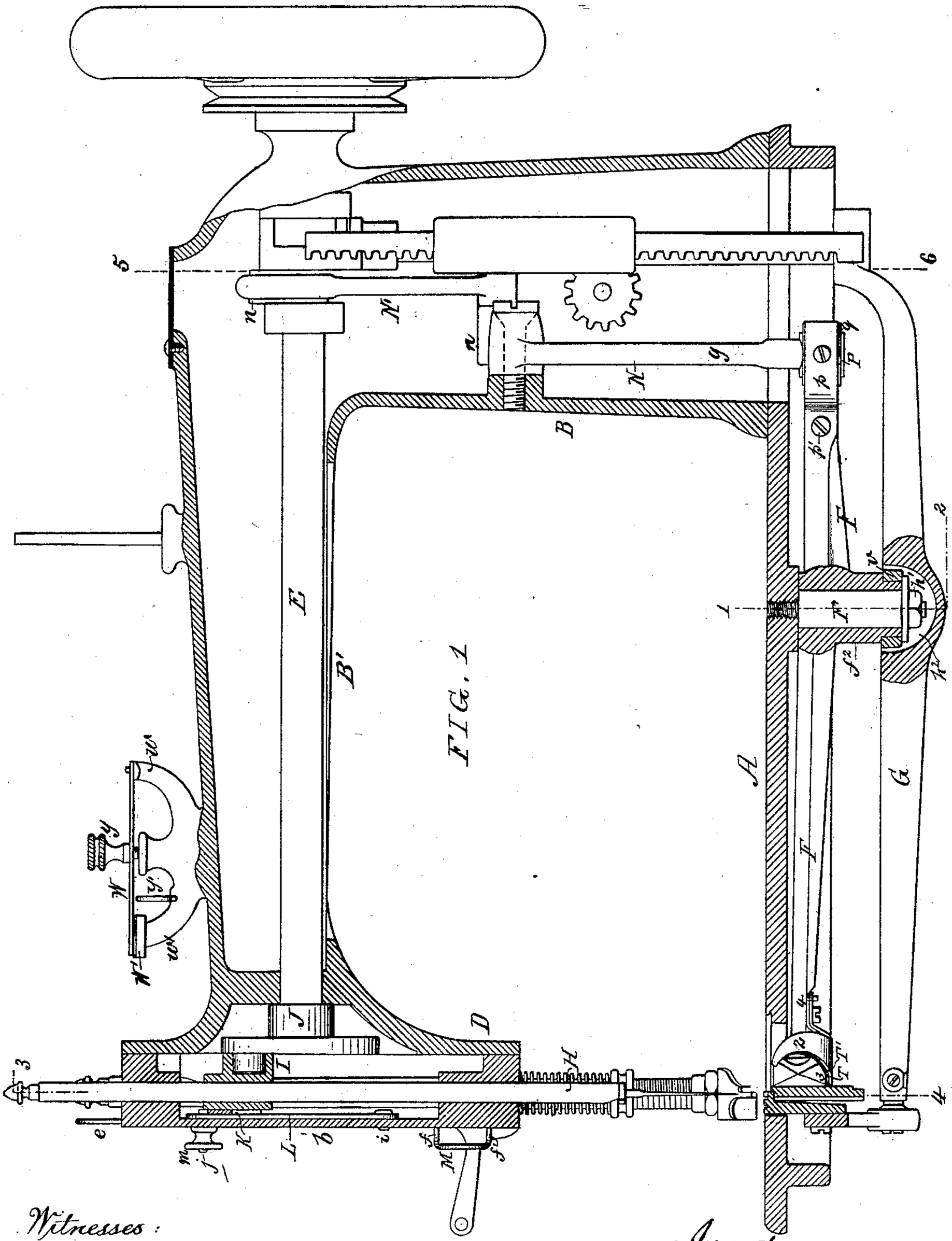

FIG. 1.

Witnesses:
David S. Williams
Harry Drury

Inventor:
George S. Rominger
by his attorneys.
Howson and Sons

(No Model.) 4 Sheets—Sheet 2.

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SEWING MACHINE.

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FIG. 3.

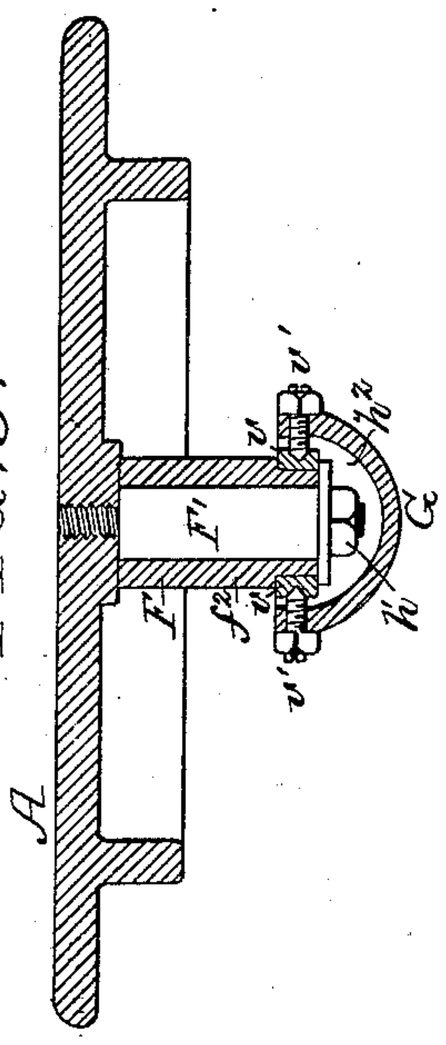
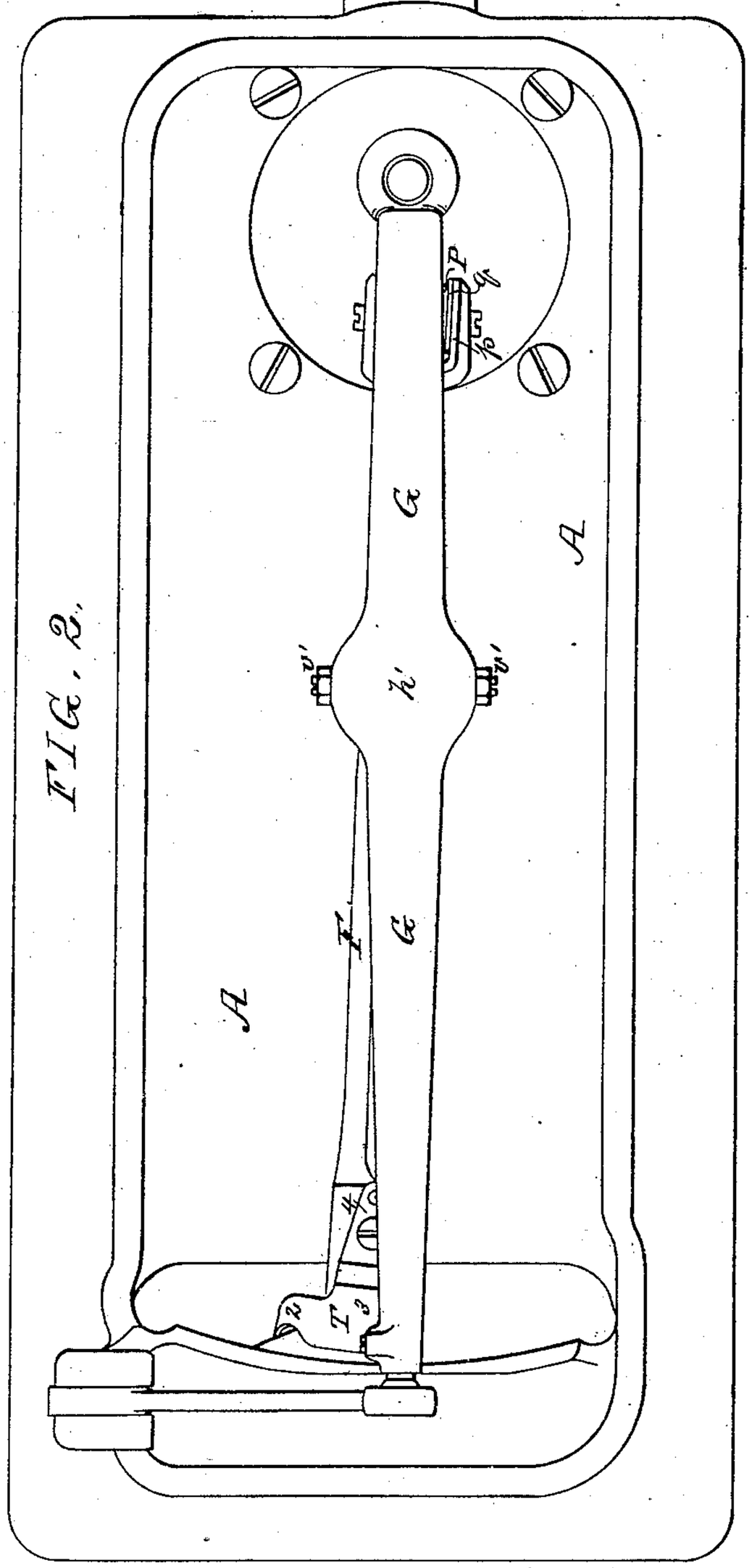


FIG. 2.



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(No Model.) 4 Sheets—Sheet 3.

G. S. ROMINGER.

SEWING MACHINE.

No. 256,743. Patented Apr. 18, 1882.

FIG. 5.

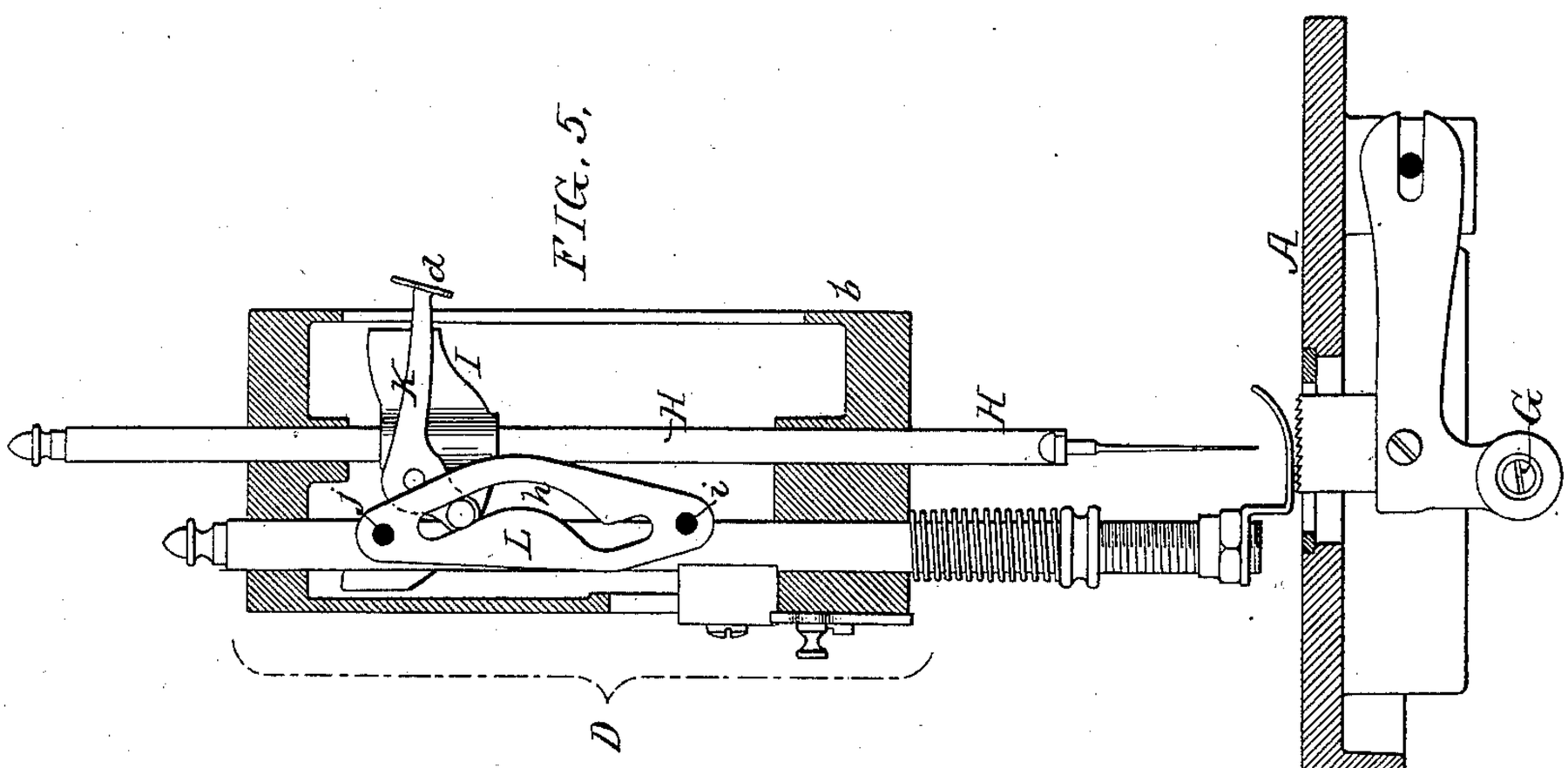


FIG. 7.

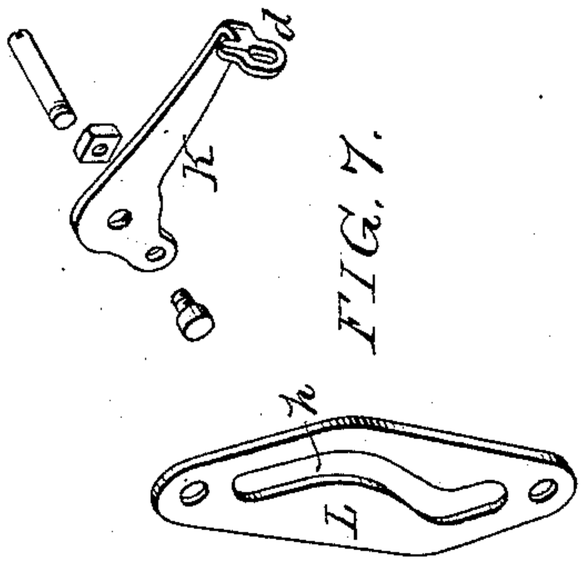


FIG. 8.

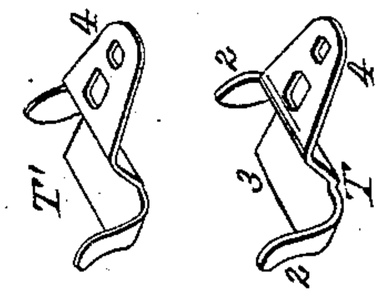


FIG. 4.

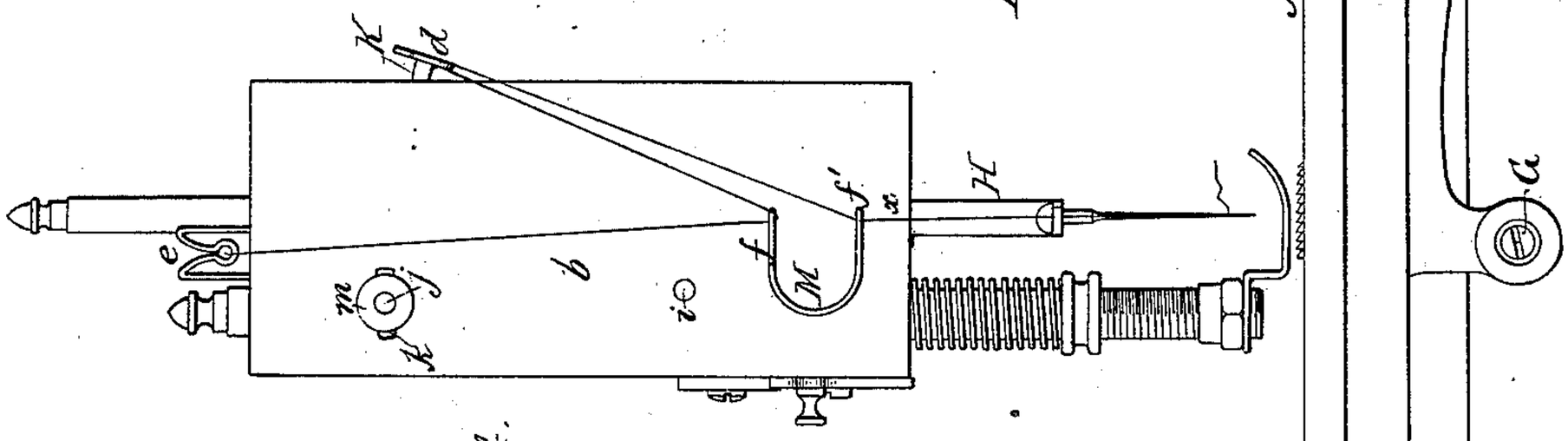
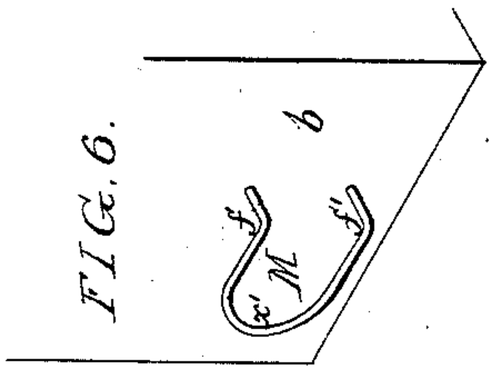


FIG. 6.



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(No Model.)

4 Sheets—Sheet 4.

G. S. ROMINGER.

SEWING MACHINE.

No. 256,743. Patented Apr. 18, 1882.

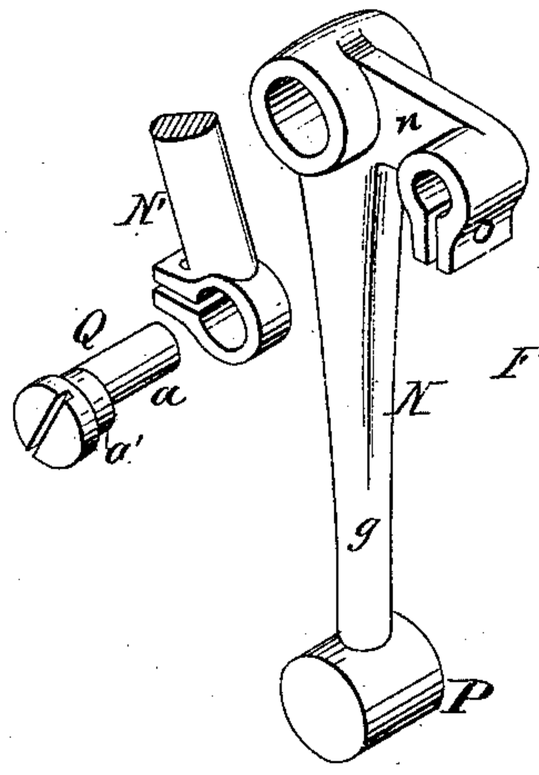


FIG. 10.

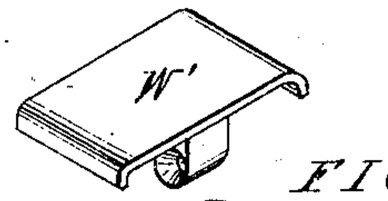


FIG. 13.

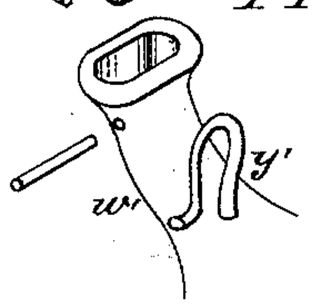


FIG. 12.

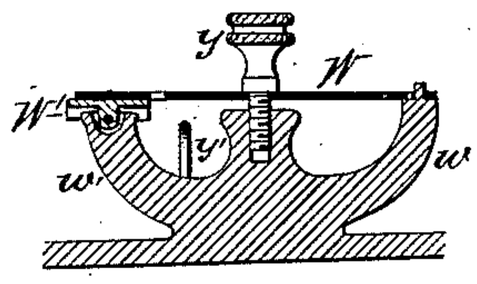


FIG. 9.

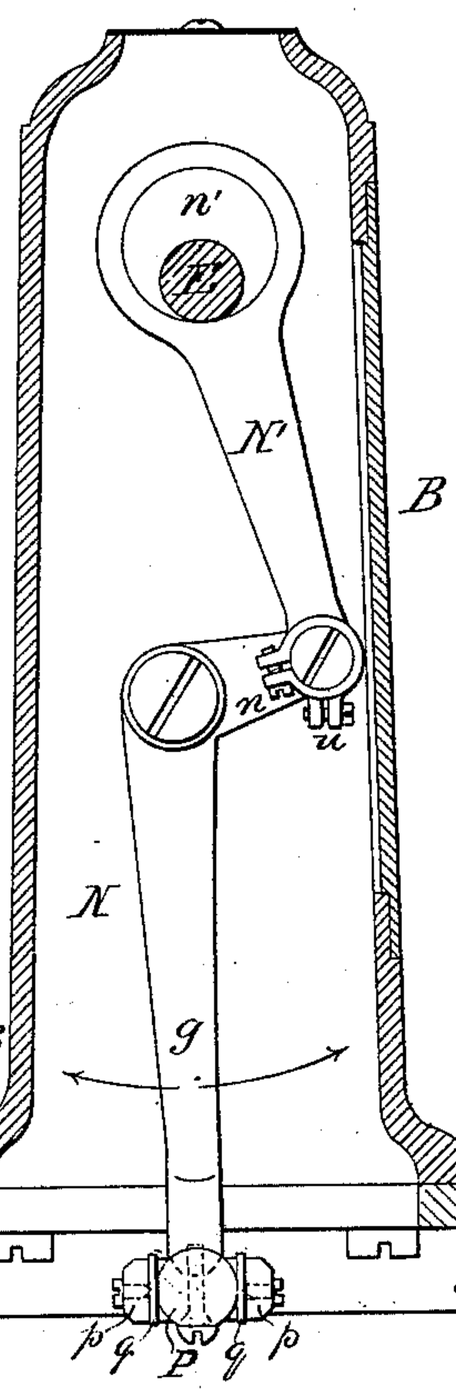
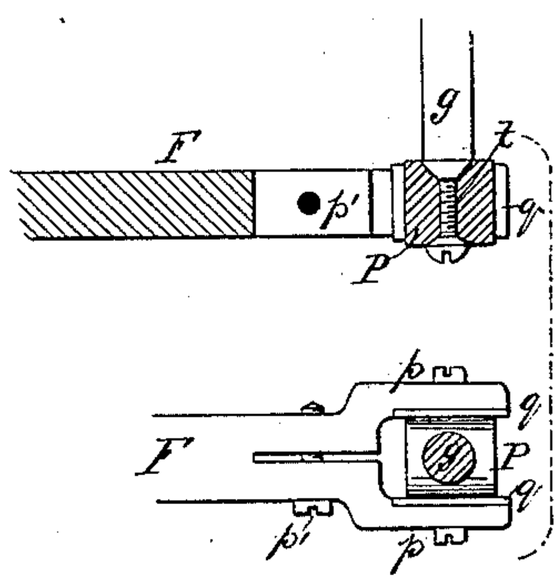


FIG. 11.



Witnesses:
David S. Williams
Harry Drury

Inventor:
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by his Attorneys
Howson and Sons

UNITED STATES PATENT OFFICE.

GEORGE S. ROMINGER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN BUTTONHOLE, OVERSEAMING AND SEWING MACHINE COMPANY, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 256,743, dated April 18, 1882.

Application filed February 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. ROMINGER, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Sewing-Machines, of which the following is a specification.

My improvements in sewing-machines consist, first, of certain mechanism for regulating the extent of the take-up of the needle-thread; secondly, of certain mechanism for actuating the shuttle-lever from the driving-shaft; thirdly, of mechanism whereby the feed-lever is hung in such a manner that it is free to be vibrated laterally and vertically; fourthly, of an improved tension device; and, fifthly, of an improvement in shuttle-drivers for lessening the noise due to their operation.

In the accompanying drawings, Figure 1, Sheet 1, is a vertical section of a sewing-machine with my improvements; Fig. 2, Sheet 2, an inverted plan view; Fig. 3, a vertical section on the line 1 2, Fig. 1; Fig. 4, Sheet 3, an elevation of the front end of the machine; Fig. 5, a vertical section on the line 3 4, Fig. 1; Fig. 6, a perspective view of a wire bent to form thread-guides; Fig. 7, perspective views of detached parts appertaining to the take-up motion; Fig. 8, perspective views of the shuttle-carrier; Fig. 9, Sheet 4, a vertical section on the line 5 6, Fig. 1; Figs. 10 and 11, detached perspective views of parts composing the device shown in Fig. 9; Fig. 12, a vertical section of the device for imparting tension to the needle-thread, and Fig. 13 a perspective view, drawn to an enlarged scale, of part of Fig. 12.

Referring to Fig. 1, Sheet 1, A is the bed-plate of the machine; B, the hollow standard, which is secured to the bed-plate, and from which projects the stationary arm B′, terminating in the head D.

E is the driving-shaft, from which a vibrating motion is imparted to the shuttle-driving lever F by mechanism explained hereinafter.

G is the feed-motion lever operated from the shaft E; and H is the needle-bar secured to a guided cross-head, I, to a curved groove, in the back of which is adapted a pin on the crank-wheel J of the driving-shaft.

I will in the first instance describe the positive take-up motion illustrated in Figs. 4 and 5, Sheet 3, on reference to which it will be seen that the needle-bar is arranged to reciprocate in bearings in the head D of the stationary arm, the cross-head I of the needle-bar being in the present instance guided and steadied by the presser-bar, as described in Patent No. 242,372, granted to my assignees on the 31st day of May, 1881. To this cross-head, or, if found more convenient, to the needle-bar itself, is pivoted a lever, K, one arm of which projects through a vertically-elongated opening in the side of the head D, and has at its outer end an eye, *d*, to which the needle-thread is admitted through a slot shown in Fig. 7. The needle-thread passes from the tension device, referred to hereinafter, through a thread-guide, *e*, Fig. 4, downward to the guide *f*, upward and through the eye *d* of the lever K, downward to the guide *f′*, and thence through a guide at the lower end of the needle-bar to the eye of the needle. The take-up lever K, being carried by the needle-bar or its cross-head, has a vertical reciprocating motion; but this would not be of sufficient extent to take up the thread unless the movement of the needle-bar should be more extended than circumstances demand, and an extended stroke of the needle-bar is objectionable for reasons well known to constructors and operators of sewing-machines. For these reasons a motion on its pivot independent of its reciprocating motion is imparted to the lever, so that it will take up at the proper time the required amount of slack thread. This motion is produced in the present instance by the aid of the plate L, which has a curved slot, *h*, adapted to receive a pin on the short arm of the lever K, so that as the latter reciprocates with the needle-bar it will be vibrated on its pivot, the slot being of such a shape as to properly time the vibration of the lever in respect to the movement of the needle-bar for the proper taking up of the thread.

The plate L may be fixed; but I prefer to make it adjustable, so that the movement of the take-up lever may be regulated to suit the requirements of different thicknesses of fabric

to be sewed. This adjustment is effected in the present instance by pivoting the plate at *i* to the front plate, *b*, of the head D of the stationary arm, a screw-stud, *j*, projecting from the upper end of the plate L through a curved slot, *k*, in the plate *b*, and being furnished with a nut, *m*, for securing the plate L after it has been adjusted.

Fig. 6 illustrates the manner of forming the thread-guides *f f'* by bending a wire, M, in the middle to form a loop, and bending it near the ends to form the guides, the bent ends being attached to the front plate, *b*, of the stationary arm of the machine.

The mechanism through the medium of which the shuttle-lever F is operated from the driving-shaft E can be best explained by reference to Figs. 1, 9, 10, and 11.

Within the standard B is pivoted a bell-crank lever, N, to the short arm *n* of which is connected the lower end of the eccentric-rod N', the upper end of the latter embracing an eccentric, *n'*, on the driving-shaft. The lower end of the long arm *g* of the bell-crank lever N is connected to the shuttle-lever F in the following manner: The said shuttle-lever is forked as shown in Fig. 11, so as to present two projections, *p p*, to the inner side of each of which is secured a hardened-steel plate, *q*, and between the two plates fits snugly, but so as to slide freely, a cylindrical block, P, also of hardened steel. The lower end of the long arm *g* of the lever N is beveled and adapted to a countersunk orifice in the upper side of the cylindrical block, a screw, *t*, passing upward through the block and into the arm, and having a beveled head adapted to a countersunk recess in the under side of the block. As the arm *g* vibrates in the direction of the arrows, Fig. 9, the block must necessarily slide vertically to a limited extent between and in contact with the hardened-steel plates *q q*. The block controlled by the arm *g* must also oscillate to a limited extent between the plates, and, owing to the vibration of the forked end of the shuttle-lever in the arc of a circle, the block must reciprocate in the forked end of the lever, and must oscillate to a very limited extent on the end of the arm *g*. It will be seen that ample provision is made for the freedom of these movements.

A portion of the shuttle-lever is severed, as shown in Fig. 11, and a set-screw, *p'*, passing through this severed portion, serves to contract the forked end of the lever when the block becomes loose between the plates *q q*.

The forked end of the lever may be hardened, so as to dispense with the steel plates; but I prefer to use the latter.

The severed ring forming the lower end of the eccentric-rod N' is adapted to the portion *a'* of the pin Q, Fig. 10, the eccentric portion *a* of the latter fitting into the severed ring forming the end of the short arm *n* of the lever N. By loosening a set-screw, *u*, the short arm of the lever will loosen its hold of the pin, and the latter can be turned to any desired extent, after which it may be again secured to the short arm of the lever by turning the said screw *u*. By the adjustment of this pin I am enabled to alter the relation to each other of the levers N N', and consequently to determine the path in which the shuttle shall vibrate in respect to the needle.

It will be seen on referring to Figs. 1 and 3 that the shuttle-lever F is pivoted to a pin, F', secured to the under side of the base-plate, the bearing of the feed-lever G being immediately below the shuttle-lever. It is essential that this feed-lever should admit of being vibrated both laterally and vertically. While it might be connected by a universal joint to the pin F', I prefer to utilize the hub f^2 of the shuttle-lever in the following manner: This hub is reduced in diameter for receiving a ring, *v*, Fig. 3, which is confined to its place by a washer and nut, *h'*. The feed-lever G has a recess, h^2, into which the hub f^2 and the ring *v* extend, and the said feed-lever is provided with set-screws *v' v'*, the points of which are adapted to recesses in the ring. This device forms a universal joint, as the feed-lever can vibrate horizontally with the ring on the hub of the shuttle-lever and vertically with its pivot-pins *v' v'* on the ring, which might be adapted to the pin F'; but, as before remarked, I prefer to apply it to the hub of the shuttle-lever.

It has not been deemed necessary to describe the mechanism for operating the feed-lever from the driving-shaft, as it may be the same as that for which Letters Patent No. 237,704 were granted to my assignees on the 15th day of February, 1881.

The tension device for imparting tension to the needle-thread is shown in Figs. 1, 12, and 13, and consists of a spring-plate, W, loosely connected at one end to an arm, *w*, on the stationary arm of the machine, and caused to bear at its opposite end by means of a set-screw, *y*, with more or less force on the thread as it passes in contact with the top of another arm, *w'*. This a well-known device, on which I have made an improvement, which can be best described on reference to the enlarged perspective view, Fig. 13. A plate, W', is loosely connected to the arm *w'*, so that it is at liberty to move in every direction and accommodate itself to the spring-plate, so that the parallelism of the plate W' with the spring-plate and uniformity of friction, and consequent uniformity of tension on the thread, will always be assured.

Different modes of loosely connecting the plate W' with the arm *w'* will readily suggest themselves. In the present instance there is a lug on the under side of the plate, and a loose pin passes through the arm and lug.

Heretofore in connection with tension devices of the class to which the improvement relates it has been the practice to use an eye, through which the thread had to be passed.

In order to obviate the threading of this eye I use a simple hook, y', into which the thread can be promptly introduced, the character and position of this hook being too clearly shown in Figs. 12 and 13 to need description.

Shuttle-drivers of different shapes, according to the conformation of the shuttle, have always projections or lips, one for striking one end, and the other for striking the other end, of the shuttle; and as the shuttle must always be loose between the projections or lips more or less noise must always accompany the action of the driver on the shuttle. I have ascertained that this noise may be materially diminished by discarding the usual driver of solid metal and so making it of two parts that although one fits comparatively close to the other the sound due to the striking of the shuttle will be partially absorbed or deadened. In the machines to which my improvements relate it has been usual to secure a shuttle-driver of the shape shown in Fig. 8 to the end of the shuttle-lever. This driver T has lips 2 2, which, together with the ledge 3, form a loose pocket for the shuttle. Instead of making this driver of one solid piece of metal, as usual, I make it in two parts, the part T′ fitting into the corresponding part T and the projections 4 4 of both being attached to the end of the shuttle-lever. Although the two parts fit together snugly enough to make an available shuttle-driver, they must necessarily be free from absolute contact with each other at one or more points, and hence, for well-known reasons, the rattling noise caused by the lips striking the shuttle will be materially diminished. It is not essential, however, in carrying out this feature of my invention that one part of the driver should be the counterpart of the other, for the same or approximately the same end could be attained by any such application to the shuttle-driver of a plate or plates as would have a tendency, by their contiguity to the driver, to deaden the rattling noise.

I claim as my invention—

1. The combination of the needle-bar or cross-head and its pivoted take-up lever with the adjustable slotted plate L and a device for securing the said plate after adjustment, substantially as described.

2. The combination of the arm g and mechanism for vibrating the same with the shuttle-lever F, provided with projections p p, having plane inner faces, and the cylindrical block P, adapted to slide and oscillate between the projections and on the lower end of the said arm g, substantially as specified.

3. The combination of the arm g, having a beveled lower end, the cylindrical block P, having an opening, with countersunk ends, the set-screw t, having a beveled head and the shuttle-lever having projections p p for embracing the block P, as set forth.

4. The combination of the rod N′, actuated by the driving-shaft, and the lever N, pivoted to the frame of the machine, with a connecting-pin, Q, having two portions, a and a', the former eccentric in respect to the latter, one portion being adapted to the said rod N′ and the other to an arm of the lever N, all substantially as set forth.

5. The combination of the feed-lever G, its recess h^2, and pivot-pins v' v' with the shuttle-lever, its hub f^2, and ring v, extending into the recess, all substantially as set forth.

6. A tension device in which two fixed arms, w w', and a spring-plate, W, loosely connected to the arm w and acted on by a set-screw, are combined with a plate, W′, having a projection fitting in an orifice in the arm w', to which the said projection is loosely connected by a pin, all substantially as described.

7. The combination of the arms w w' and the plates W and W′, of the tension device and a thread-guiding hook, y', situated at the rear and clear of said plate W′, as specified.

8. The shuttle-driver consisting of two metal plates, T T′, conforming substantially with each other and constructed for attachment to the shuttle-lever, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. S. ROMINGER.

Witnesses:
HARRY DRURY,
HARRY SMITH.