(No Model.)

2 Sheets—Sheet 1.

W. A. ULREY.

SPRING MOTOR.

No. 477,478. Patented June 21, 1892.

Fig. 3.

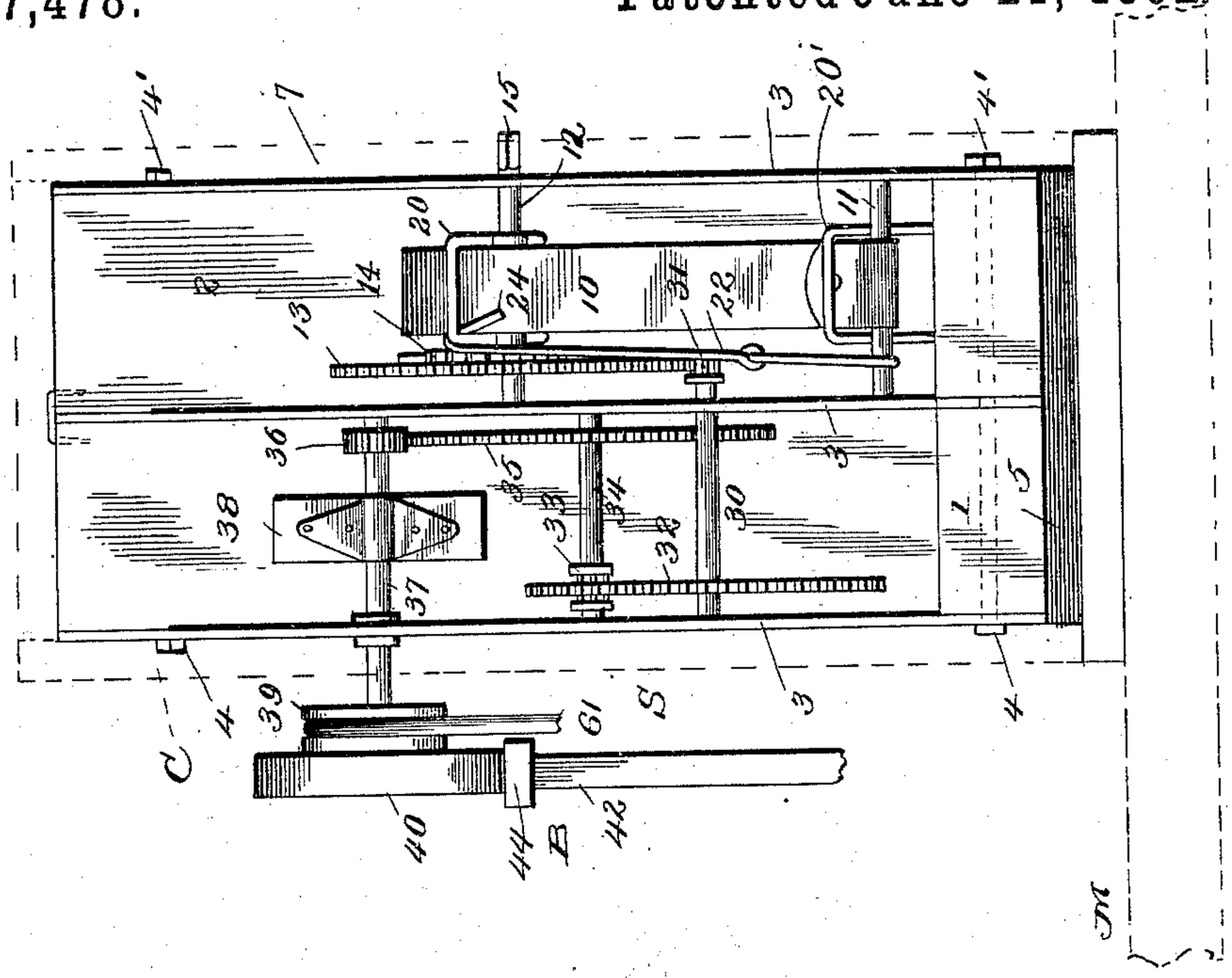
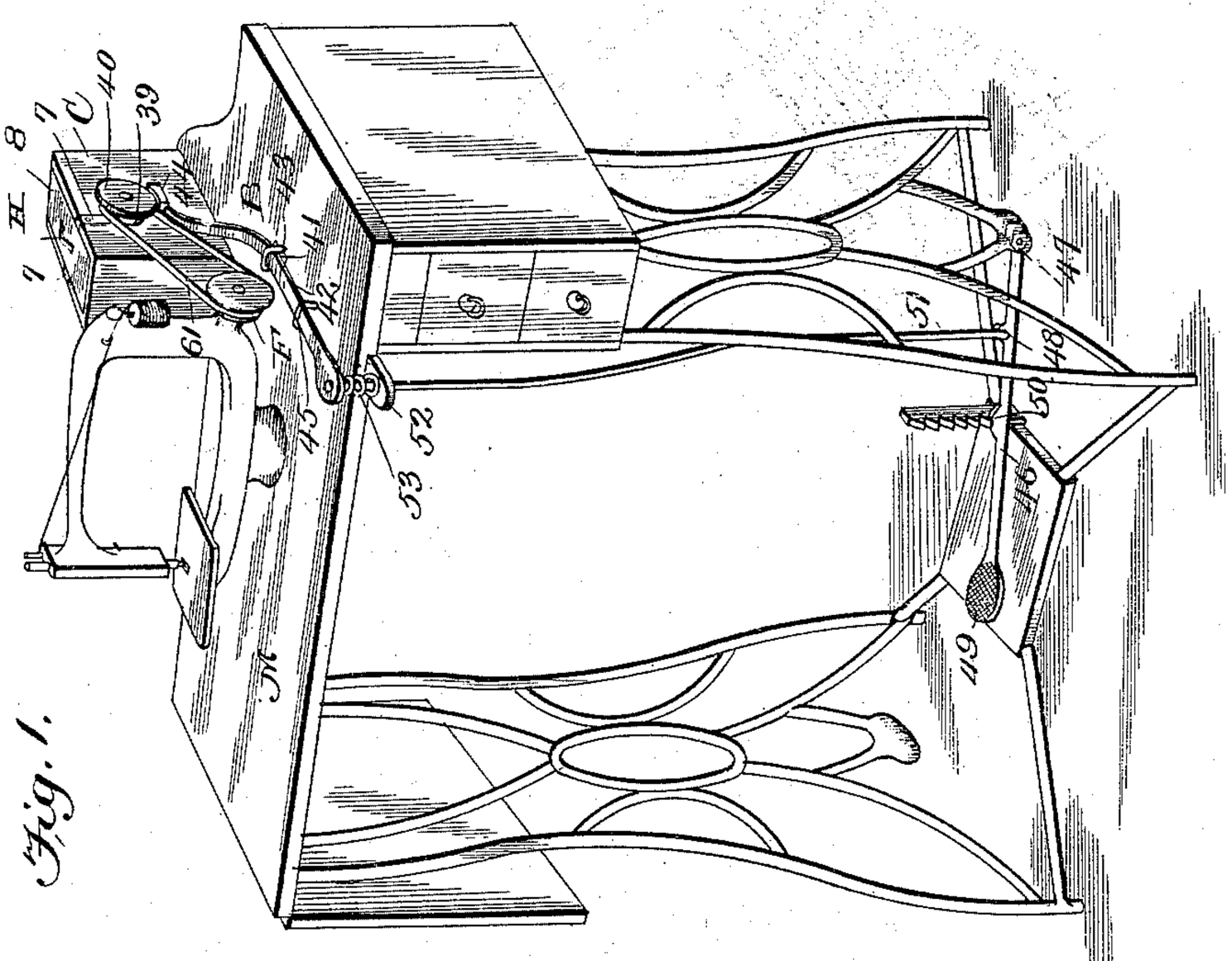


Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

W. A. ULREY.

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Fig. 2.

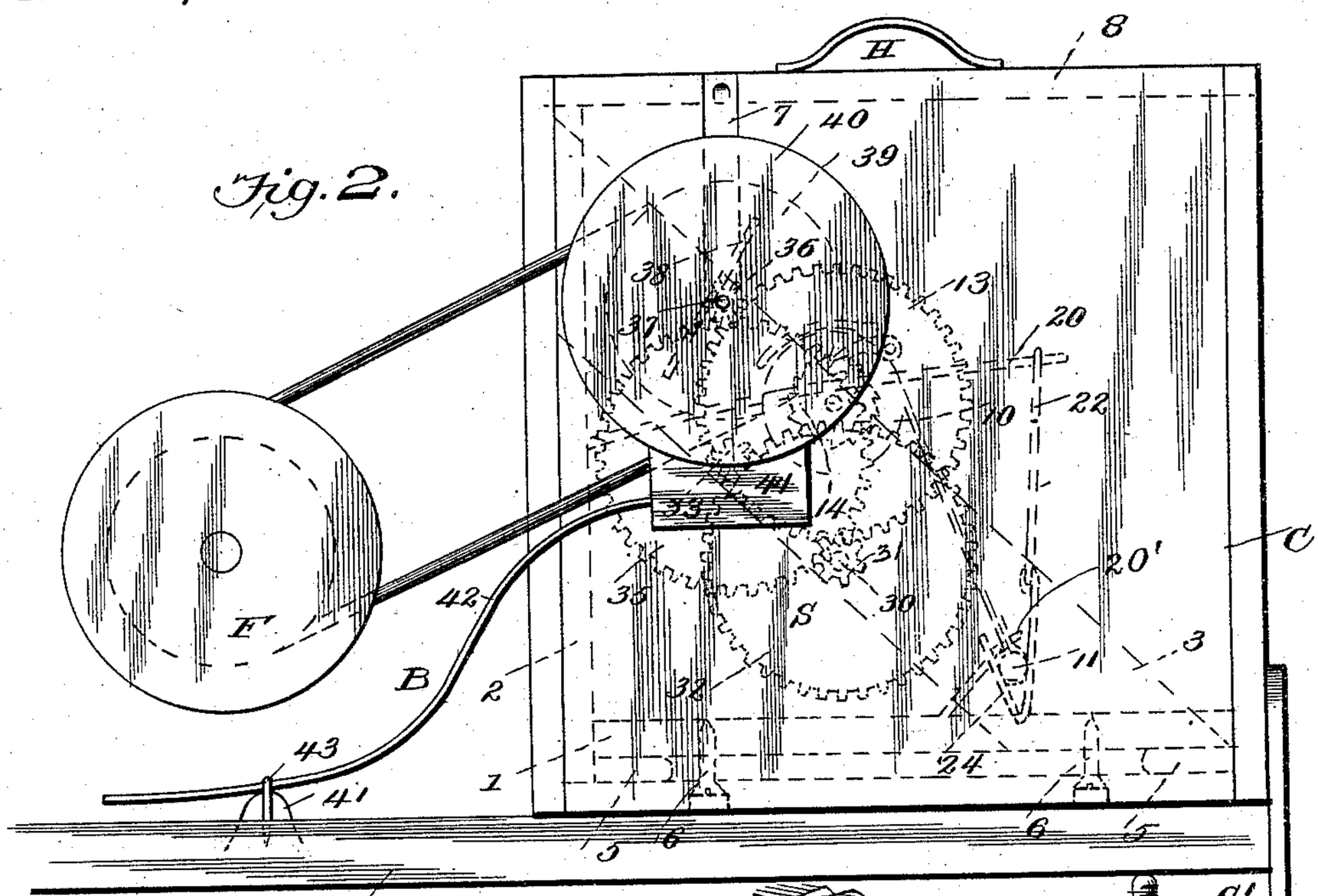

Fig. 5.

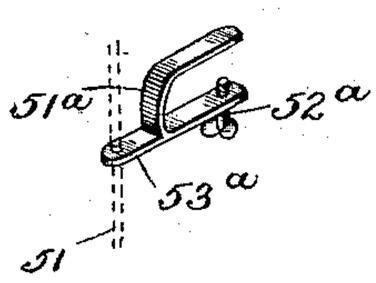

Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM A. ULREY, OF PIPESVILLE, OHIO.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 477,478, dated June 21, 1892.

Application filed March 18, 1892. Serial No. 425,475. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. ULREY, a citizen of the United States, residing at Pipesville, in the county of Knox and State of Ohio, have invented certain new and useful Improvements in Spring-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mechanical motors of that class adapted to be run by a spring; and the object thereof is to effect certain improvements in the details of construction of such a machine.

To this end the invention consists in the specific construction hereinafter more fully described in general, and set forth in particular in the claims, and as illustrated in the drawings, wherein—

Figure 1 is a perspective view of a sewing-machine with my motor in position thereon in its case. Fig. 2 is an enlarged right-side elevation of the motor and the fly-wheel of the sewing-machine, showing also the brake-mechanism. Fig. 3 is a rear elevation of the motor, showing the case in dotted lines. Fig. 4 is a perspective detail of the spring-guides and driving mechanism. Fig. 5 is a perspective detail of an additional clamp which I sometimes employ.

Referring to the said drawings, the letter M designates a sewing-machine or other piece of light machinery having a fly-wheel F, by which it is adapted to be driven, and S is my improved motor inclosed within a casing C and detachably attached to the top of the sewing-machine by clamps C′ of the pattern shown or any other approved construction. This motor stands on the top of the machine-table and in rear of the machine-head, and the movements of the motor are controlled by a brake mechanism B of the specific construction shown, and which leads to a point within easy reach of the operator's foot beneath the table of the sewing-machine. The motor is light and compact, and when disconnected from the machine may be carried by a handle H on the casing, as shown.

An L-shaped frame-work is located within the casing and comprises a foot 1 and an upright 2, these parts being connected by inclined metallic strips 3—three in number—in which the several shafts have their bearings and between which the wheels rotate, as shown. The base or foot 1 is in two parts, as also is the upright 2, and the intermediate strip passes between these parts, transverse bolts 4 passing through the three strips and the two parts of the foot and upright to detachably connect the parts. Beneath the foot is located several rubber cushions 5, and screws 6 pass upwardly through the bottom of the case and into the foot. The latter is thereby connected with the casing securely, yet all noise is avoided, as the cushions intervene and the heads of the screws are countersunk in order to avoid scratching the table of the sewing-machine. No other connection between the motor frame-work and the case is necessary, and when it is desired to remove the motor from its case, as for cleaning or repair, the screws are withdrawn and the motor lifted out. The winding-stem and the shaft of the power-wheel of the motor extend through vertical slots in the sides of the casing and slides 7 pass downwardly into these slots to close them above their bottoms and below the cover 8 of the case, whereby the latter is rendered almost dust-proof and dirt is excluded from the case, as will be clear.

Between the two right-hand strips 3 (as viewed from the rear) is located the mainspring 10, whose outer end is secured to a rod 11 and whose body is coiled upon the winding-shaft 12 in the usual manner, this shaft having a main wheel 13 with a ratchet 14 adjacent, and the outer end 15 forming the winding-stem for the key, as will be clear. The journals of this shaft and the ends of the rod 11 are in the two right-hand strips 3, so that when it is desired to remove the winding and driving mechanism without disturbing the gearing, the extreme right-hand strip 3 is removed from the bolts 4 by removing their nuts 4′ and only partially withdrawing their bodies from place. Hence, this winding and driving mechanism can be removed without the dislocation at all of the balance of the motor.

In the upright 2 is seated a long staple 20, whose sides stand astride the mainspring, and in the foot is seated another staple 20′, standing over the outer end of the spring, by

which staples the spring is prevented from lateral displacement. The free or outer end of the long staple is borne down upon the main shaft by a link 22, having at one end an ordinary hook 23 and at the other end a long oblique hook 24, standing at right angles to the hook 23. The latter is engaged under the rod 11 and the long hook over one side of the long staple to bear the latter down to position. When it is desired to bend it farther down, and thus to impart a slight friction to and upon the main shaft, this link is reversed, its short hook taking over the long staple and its long hook under the rod, and the size of the latter will prevent the long hook from seating as closely thereunder as will the small hook, whereby the link will be shortened, as seen in Fig. 2.

At the other side of the center strip 3 is located the gearing mechanism, preferably constructed as follows: 30 is the first shaft, having one end projecting through this central strip 3 and carrying a basket-pinion 31, meshing with and driven by the main wheel 13. This shaft carries a large pinion 32, meshing with a basket-pinion 33 on the second shaft 34, and this shaft carries a large pinion 35, meshing with a pinion 36 on the third or "fan" shaft 37, so called because it preferably carries a fan-governor 38, which not only acts as a speed-regulator, but also constantly blows the dust from the machinery. Additional shafts may of course be interposed to further gear up the device, but all of them have their journals in the two left-hand strips 3, so that this part of the mechanism may be removed without disturbing the driving mechanism, if the nuts 4′ be located on that end of the bolts 4. The last or fan shaft 37 extends through the left-hand strip 3 and carries the power-wheel 39, from which power is communicated to the machinery to be driven—in the present case a sewing-machine M.

The brake mechanism which I preferably use in connection with this motor is of a peculiar construction, the object being to carry out the idea of having the machine as noiseless as possible, and to this end it is made as follows: On the shaft 37, adjacent or formed integral with the power-wheel 39, is the brake-wheel 40, of somewhat greater diameter than said power-wheel, as shown, in order that the brake will not interfere with the belting, hereinafter described. 41 is a rubber or leather block mounted on the table-top of the sewing-machine, and across this block passes a spring-lever 42, the same being held in place on the block by a staple 43, as seen. The rear end of this brake-lever carries a rubber or leather brake-shoe 44, which stands under the brake-wheel 40, while the forward end of the lever passes under a retaining-staple 45 in the table-top and projects over the front edge of the latter. 46 is a foot-lever pivoted at 47 to the frame-work of the sewing-machine stand, having an eye 48 in its body and having a foot-plate 49 at its opposite end. Adjacent this end a hook or toothed plate 50 on the stand is adapted to engage the lever when borne down and pressed to the rear into engagement with said plate. From the eye 48 a rod 51 leads up through an eye 52 in the front edge of the table-top, through a coiled expansive spring 53, resting on said staple, and is secured to the front end of the spring brake-lever, the expansive force of this coiled spring tending to overcome the weight of the foot-lever and also to raise the front end and depress the shoe on the rear end of the brake-lever, as will be clear. F is the fly-wheel of the sewing or other machine, and 61 is a belt connecting this wheel with the power-wheel 39 of the motor, although, obviously, gearing could be here used, if preferred.

I have called the part 52 an eye above and so shown it in Fig. 1 of the drawings; but some users of this device may object to inserting such an eye in the table-top, and hence there may be provided a clamp, as seen in Fig. 5, which can be detachably secured to the front edge of the table-top and will not mar the same. This clamp comprises a U-shaped body 51ª, through whose lower arm passes a screw 52ª, which bears against the under side of the table-top, and at its outer end the clamp carries an eye 53ª, serving the same functions and uses as the eye 52, all as well illustrated and as will be clear to those skilled in the art. The retaining-staple 45 may be omitted to preserve the beauty of the table-top, but I have no manner to suggest whereby the staple 43 can be omitted, as the lever would then soon become displaced. This, however, is the only part that is absolutely attached to the table-top and cuts into the same, as the clamps are removable at will.

The motor is preferably made in several sizes and finishes, according to the work to be done and the ornamentation it is desired the device shall have, and the proportions and finish are of course matters of preference. To apply this device to an ordinary sewing-machine, the brake mechanism B is applied as described and the motor is put in position and secured by the clamps C′, as will be clear, the belt 61 being of course tight enough to connect the motor with the fly-wheel in an operative manner. The motor stands to the rear of the machine-head out of the way, yet where the winding-stem may be reached when necessary; but with the usual strength of spring and the gearing about as described the motor will sew a whole dress with one winding. The key being applied and the spring wound, the motor commences to run, and the sewing-machine is driven thereby, the fan regulating the speed about as desired. If the sewer or operator is naturally slow and will always want the motor to run slowly, the link 22 is adjusted, as described, to impart a slight friction to the main shaft. Otherwise it is left so as to avoid

this friction. The cushions within the case prevent noise and rattle, and the clamps hold the device firmly upon the machine-table.

To regulate the speed of the machine temporarily, the foot is applied to the treadle and the outer end of the brake-lever thereby borne down against the tension of the coiled spring 53, the lever rocking over the rubber block without friction or noise. If the power-wheel 39 be then running very rapidly, the spring-lever 42 will yield in its body as the shoe 44 contacts with the face of the wheel, and this yielding is entirely independent of and additional to that of the coiled spring 53. The latter lifts the foot-lever, which is rigidly connected with the brake-lever; but this lever springs in its body according as the machine requires. The leather shoe continues the anti-rattling idea and the fan as well. To say more of the machine would be surplusage; but I desire to reserve the right to make such changes as come within the spirit of the invention.

What is claimed as new is—

1. In a spring-motor, the combination, with the power-shaft, the driving-spring connected therewith and wound thereon, and the gearing driven by said shaft, of a fixed rod below the shaft, a long staple seated in an upright and lying across the shaft astride the spring, and a link having hooks at its ends, one of which is adapted to embrace said rod and the other of which is oblique, so as not to fit the rod so closely, as and for the purpose set forth.

2. In a device of the character described, the combination, with a machine-table, of a motor, means for detachably attaching it to the table, rubber blocks between the motor and the table, a brake-lever, a rubber block on the table and over which the brake-lever rocks, a shoe at one end of the lever, adapted to make contact with the power-wheel of the motor, a treadle connected with the other end of the lever, and a spring between the other end of said lever and the table, as and for the purpose set forth.

3. In a device of the character described, the combination, with a machine-table, of a motor, means for detachably attaching it to the table, rubber blocks between the motor and the table, a spring-brake lever, a rubber block on the table and over which the brake-lever rocks, a shoe at one end of the lever, adapted to make contact with the power-wheel of the motor, and means for depressing the other end of the lever at will, as and for the purpose set forth.

4. In a motor, the combination, with the driving mechanism, the power-shaft, and a brake-wheel on said shaft, of a brake-lever of spring metal centrally pivoted to a support, a shoe on one end thereof adjacent said wheel, a treadle, a rod connecting this treadle with the opposite end of the brake-lever and passing through a stationary eye, and an expansive coiled spring between this staple and the brake-lever, all as and for the purpose set forth.

5. In a device of the character described, the combination, with a machine-table, a foot-lever pivoted thereto, an eye carried by the front edge of the machine-table top, and a rod leading from the foot-lever upwardly through said eye, of a motor-case, a rubber block in the table-top, a spring-brake lever passing centrally over said block, a staple over the lever and block, the front end of this brake-lever passing under a staple in the table-top and being connected with said rod, and a coiled expansive spring between said front end and the eye at the front edge of the table-top, all substantially as and for the purpose set forth.

6. In a device of the character described, the combination, with a machine-table and a motor, of a brake pivoted to the table, a foot-lever, a rod connecting said brake and lever, a clamp detachably secured to the front edge of the table-top and having an eye through which said rod passes, and a spring between said eye and brake, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. ULREY.

Witnesses:
WM. WALKER,
OTTO CASTLE.