(No Model.) 2 Sheets—Sheet 1.

A. A. WOOD.

SPRING MOTOR.

No. 428,326. Patented May 20, 1890.

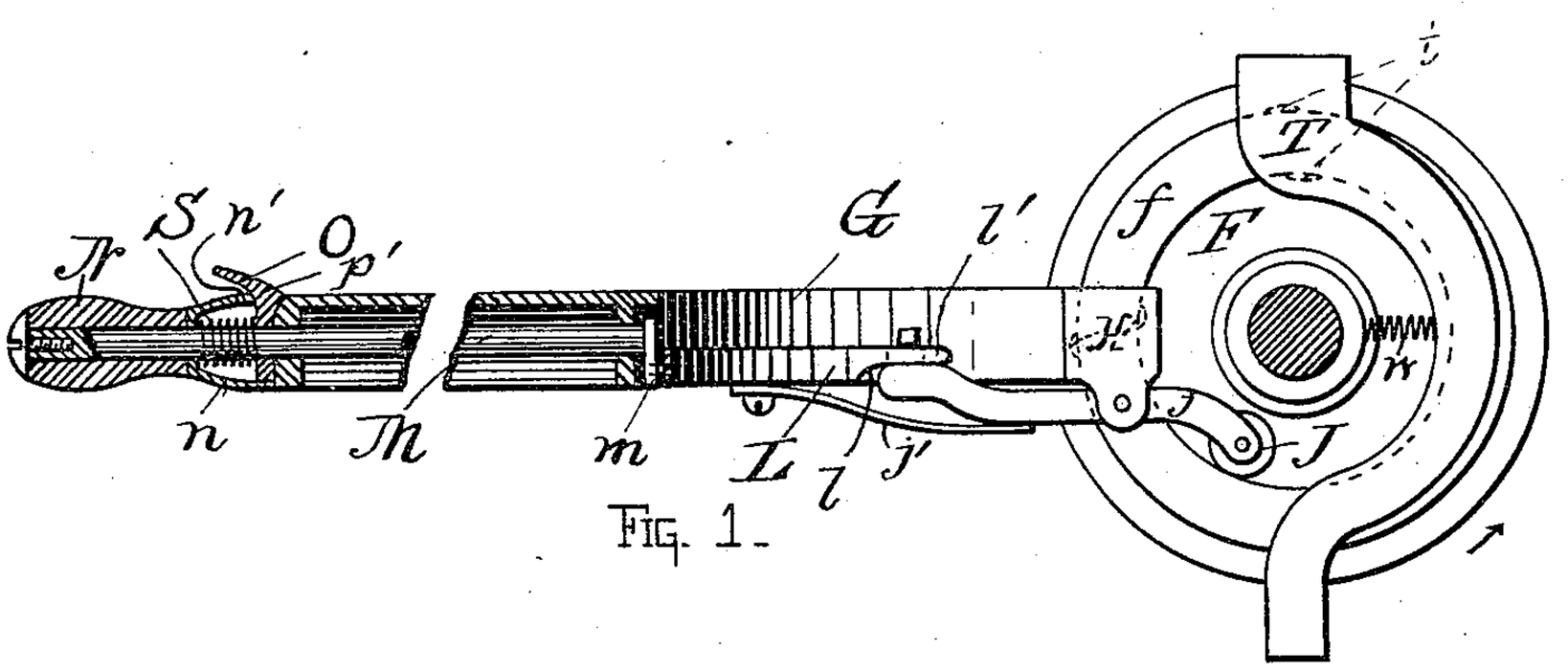

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

Witnesses
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E. F. Blunt

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(No Model.) 2 Sheets—Sheet 2.

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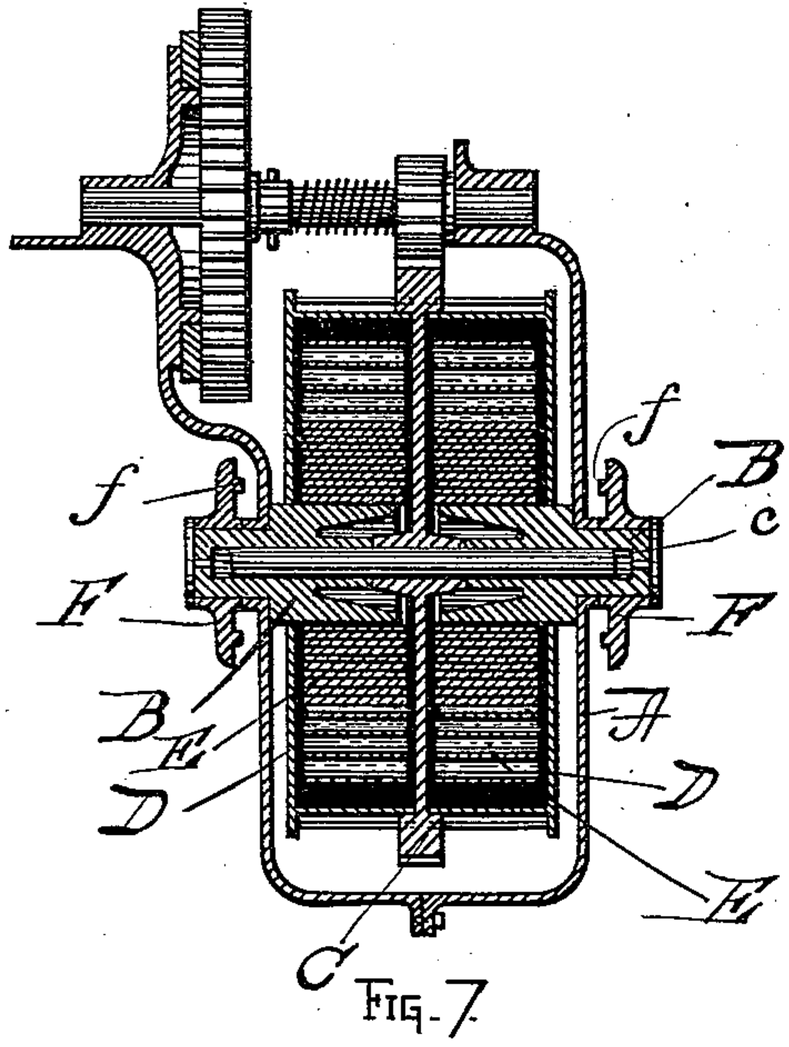

FIG. 7.

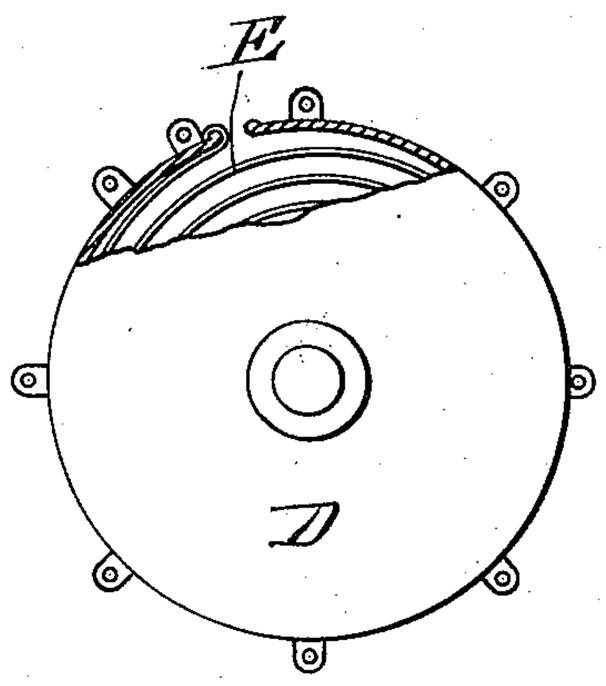

FIG. 8.

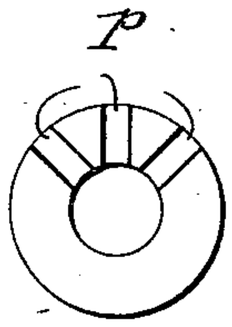

FIG. 9.

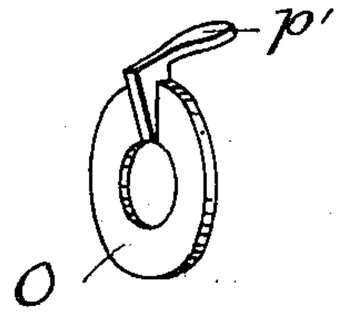

FIG. 10.

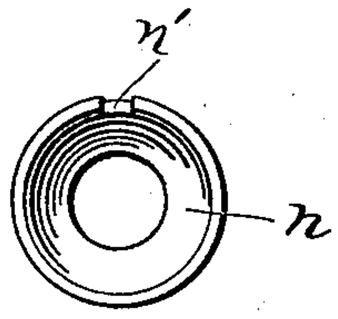

FIG. 11.

WITNESSES:

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INVENTOR

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BY

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALBERT A. WOOD, OF ATLANTA, GEORGIA, ASSIGNOR TO THE BROSIUS MOTOR SEWING MACHINE COMPANY, OF SAME PLACE.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 428,326, dated May 20, 1890.

Application filed August 31, 1889. Serial No. 322,598. (No model.)

To all whom it may concern:

Be it known that I, ALBERT A. WOOD, a citizen of the United States, and a resident of Atlanta, in the county of Fulton and State of Georgia, 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 make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form part of this specification.

This invention relates to the kind of motors usually used for driving sewing-machines, the object being to improve the construction, especially of the mechanism for winding the springs, so as to prevent any lost motion, as in ratchets, and to prevent any disagreeable noise.

The invention consists of a lever having a frictional connection with a flanged disk and means for preventing the recoil of the springs and other details, as will be hereinafter fully described.

In the accompanying drawings, Figure 1 is a central vertical section through a lever that is adapted to wind two arbors, showing its attachment to the disk of one arbor, and showing most of the mechanism by which the arbors may be wound alternately or together. The lever by which the recoil is prevented is also shown. Fig. 2 is an outside view of part of the winding-lever, this lever being of bifurcated form, and the view in this figure being from the same direction as in Fig. 1. The part is shown that is omitted in that figure—that is to say, the part that works on the disk not shown in that figure. Fig. 3 is an end view of the lever. Fig. 4 is a plan of the inner or bifurcated ends of the lever, and showing in horizontal section the flanged disks and levers that prevent the recoil of the arbors. Fig. 5 shows the outside of one of the inner ends of the lever, the view being the same as that shown in Fig. 2, except that the outer side of the flanged disk is shown, as are also the two ends of the lever that prevents the recoil, and means by which one end is attached to a fixed part of the device. Fig. 6 is a view of the lever that prevents the recoil. Fig. 7 is a vertical central section through the arbors, springs, and casing of a spring-motor, showing also some of the gearing and a part of the winding mechanism. Fig. 8 is a side view of one of the spring-barrels, a portion being broken away to show the spring. Fig. 9 is a view of the outer end of the lever G. Fig. 10 is a perspective of the catch that engages with the lever in the ratchets shown in Fig. 9. Fig. 11 is a view of the cup-shaped inner end of the handle of the lever.

In these several figures the arm of the bifurcated lever shown in Fig. 1 is the right-hand arm in Fig. 3 and the top one in Fig. 4, and the one shown in Fig. 5 is the left-hand arm in Fig. 3. The lever to prevent the recoil shown in Fig. 1 is the reverse of that shown in Figs. 5 and 6, there being two of these levers, as shown in section in Fig. 4.

Like reference-marks indicating like parts in all the views, A is the casing, journaled in which are the arbors B. These arbors are hollow and form the journal-bearings for the shaft *c* of the gear C, as shown in Fig. 7. On each side of the gear C is one of the spring-barrels D, to each of which the outer end of one of the springs E is attached, the inner ends being attached to the arbors B. As these arbors are entirely separate, it is obvious that these springs may be wound separately or together by the mechanism that I will now describe. The disks F, having flanges *f*, are attached to the arbors, as shown in Fig. 1. The bifurcated lever G revolves around from side to side of the casing A and grasps the flanges *f*. This lever is shown in Figs. 1, 2, 3, 4, and 5, and its engagement with the flanges is frictional and by means of the hardened steel pieces H. (Best shown in Fig. 2.) These steel pieces are of cylindrical form and inserted loosely as pins, recesses *g* being cut in the lever, as shown in Figs. 2 and 4. The pins are also cut away to the same depth and about to their axial centers and made to conform on the faces thus formed to the form of the flange surfaces against which they work. As the engagement of the lever with the flanges *f* is by the hardened pieces H, it is obviously necessary that the lever should not otherwise come in contact with the working-surfaces of the flanges.

Therefore the recesses *g* are somewhat wider than the flanges *f* to allow the pieces H to project and insure contact with the flanges. The downward pressure of the lever G will insure a sufficient pressure of the pieces H with the flanges *f* to prevent slipping. Consequently the downward movement of said lever will cause the disk to revolve to the same extent. The rollers J, journaled on the lever *j* and pressed against the inner side of the flange *f* by the spring J′, lift the lever so that the pieces H press against the flange and are always ready to grip the flange on the downward pressure of the lever. The recoil of the disk is prevented by the lever T having the same kind of frictional contact as the lever G by pieces *t*, the opposite end of the lever being fixed, as shown in Figs. 5 and 6, and the pressure necessary to preserve the contact being supplied by the spring *w*.

To wind the springs separately, the action of the lever on one cam may be neutralized by depressing the spring-pressed end of the lever *j*, which will allow the lever G to drop on that side sufficiently to prevent its engagement with the flange. This depression is accomplished by means of the semicircular piece L, the crank *m* on the shaft M, and the handle N. The ends of the semicircular piece L are reduced in vertical width, forming on each a sloping or wedge-shaped lower edge *l*, as shown in Fig. 1. It will be seen that the turning of the semicircular piece in either direction will depress the end of the lever with which it comes in contact and raise the roller J as regards the lever, and thereby allow that side of the lever to drop sufficiently to prevent the frictional contact that would be necessary to cause the pieces H to engage with the flange *f*.

Projecting beyond the wedge-shaped part *l* are tongues *l′*, that carry the two ends of the semicircular piece, the central part being carried on the crank *m* on the shaft M. The revolving of this shaft by the handle N, to which it is attached, turns the semicircular piece L, as above described, in either direction, or brings it back to its original position—that is to say, the central position or the position in which it will not raise either of the rollers J. The catch O (shown in perspective in Fig. 10 and in position in Fig. 1) fits loosely on the shaft M and in a cup-shaped part *n* of the handle, the part *p′* passing through a slot *n′*. A spring S presses it against the end of the lever G, and as the handle is turned will cause the part P to enter either of the notches *p*, Fig. 9, in the end of the lever G, which will hold the shaft, crank, and semicircular piece in any one of the three positions that are required. A pressure on the part *p′* will release the catch and permit the handle and connecting parts to be turned. The recoil of the flanged disks F is prevented by the levers T, one end being provided with semicircular pieces *t*, similar to the pieces H in the lever G, and the other end being held between lugs *t′* on the casing of the springs, as shown in Figs. 5 and 6. The constant engagement of the lever with the flange is insured by the spring *w*, Fig. 1.

It is obvious that it would not be a deviation from the invention to omit the pieces H in the lever G or the pieces *t* in the lever T, as the solid parts of those levers might be made to perform the same functions; but the form shown is preferred, as it insures parallel bearing-surfaces between those pieces and the flanges.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a spring-motor, winding mechanism consisting of the disks F, having flanges *f* and attached to the spring-arbors B, the lever G, the spring-actuated levers *j*, and the rollers J, arranged substantially as shown and described, and for the purpose specified.

2. In a spring-motor, winding mechanism consisting of the flanged disks F, attached to the arbors B, the levers G, spring-actuated levers *j*, rollers J, semicircular piece L, crank M, and shaft *m*, substantially as shown and described.

3. In a spring-motor, winding mechanism consisting of the flanged disks F, the lever G, the spring-actuated levers *j*, the rollers J, the semicircular piece L, the crank *m*, and shaft M, the cup-shaped extension *n* of the handle N, the springs S, and the catch O, the lever G being recessed to receive the projection P on the catch O, substantially as shown and described, and for the purpose specified.

4. In a spring-motor, the spring-arbors B, disks F, having flanges *f*, the levers T, and lugs *t′*, substantially as shown and described, and for the purpose specified.

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

ALBERT A. WOOD.

Witnesses:
A. P. WOOD,
WILLIE KEITH.