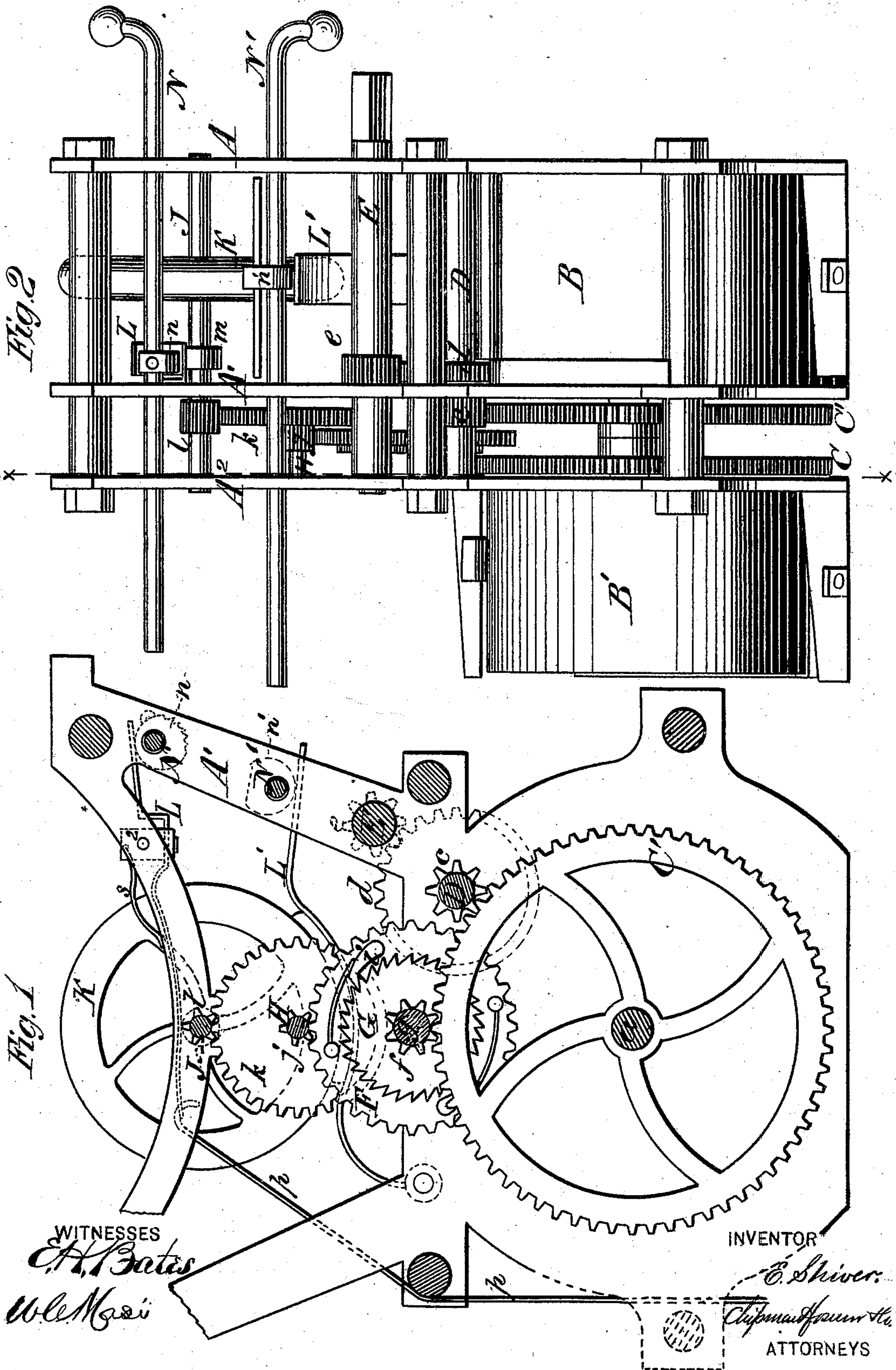


E. SHIVER.  
SPRING MOTOR.

No. 171,438.

Patented Dec. 21, 1875.



WITNESSES  
*E. H. Bates*  
*W. L. Mason*

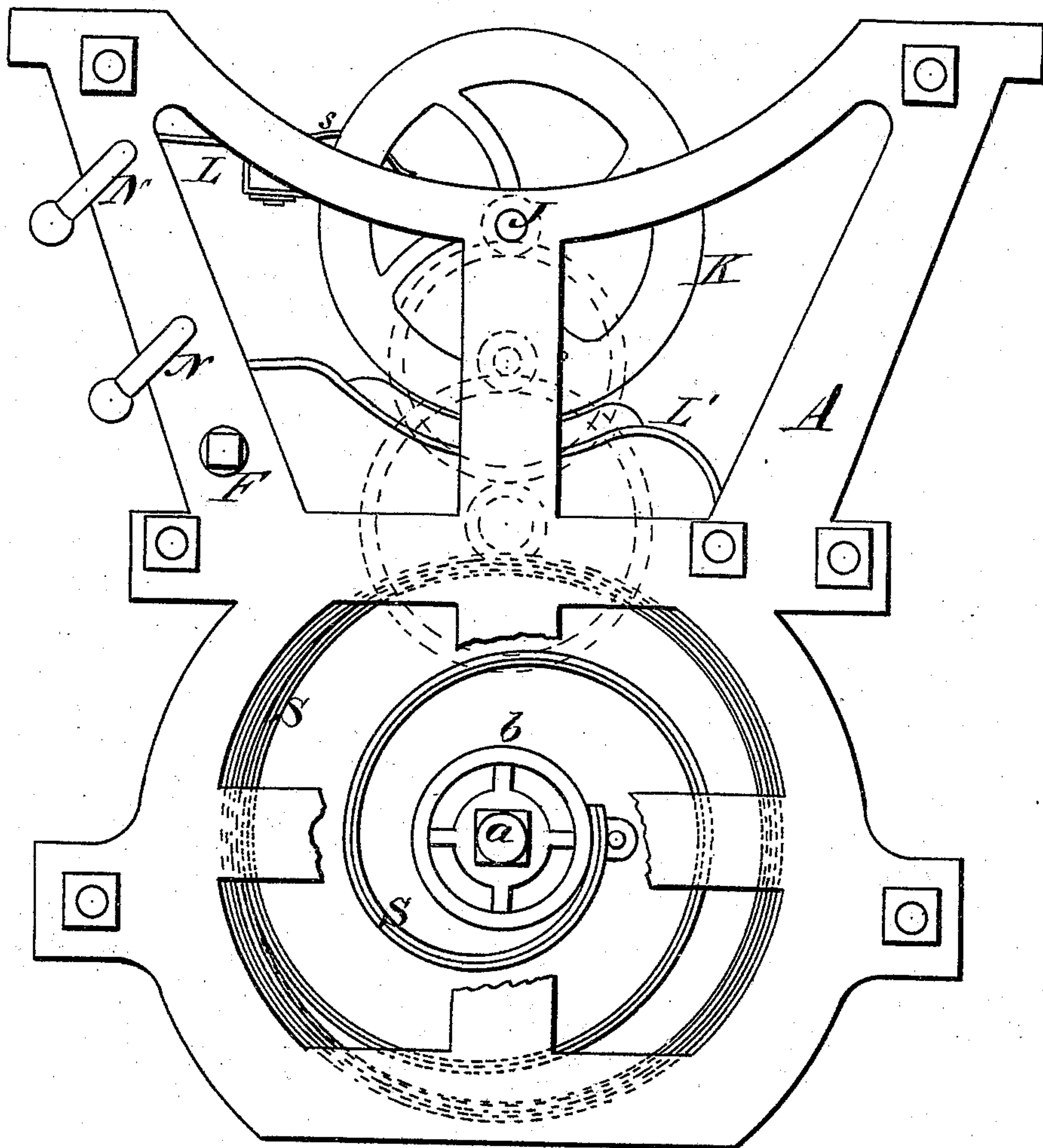
INVENTOR  
*E. Shiver*  
*Chipman & Son*  
ATTORNEYS

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*Fig. 3*



WITNESSES

*E. H. Bates*  
*Eugene Adamson*

INVENTOR

*E. Shiver*  
*Chipman & Co.*  
ATTORNEYS



# UNITED STATES PATENT OFFICE

ELISHA SHIVER, OF BALTIMORE, MARYLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM C. DREYER, OF SAME PLACE.

## IMPROVEMENT IN SPRING-MOTORS.

Specification forming part of Letters Patent No. **171,438**, dated December 21, 1875; application filed October 30, 1875.

*To all whom it may concern:*

Be it known that I, ELISHA SHIVER, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and valuable Improvement in Spring-Motor; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a section cut vertically through Fig. 2 at *x x*. Fig. 2 is an end elevation. Fig. 3 is a side elevation.

This invention has relation to motors for driving sewing-machines, watchmakers' lathes, and other light machinery wherein the motive power is derived from springs which are wound up like clock-springs.

The nature of my invention consists in the novel arrangement of two or more volute springs, firmly united at both ends, and inclosed in a suitable case; in a novel arrangement of the spring-drivers and train of wheel-work, in combination with friction-brakes and a regulating-treadle, as will be hereinafter explained.

The frame of the machine represented in the annexed drawings consists of three vertical standards, *A A<sup>1</sup> A<sup>2</sup>*, arranged at suitable distances apart, and rigidly united by means of transverse bolts and stay-tubes. Between the two standards *A A<sup>1</sup>* is a cylindrical case, *B*, and on the outside of the standard *A<sup>2</sup>* is a cylindrical case, *B'*. The two cases *B B'* are rigidly held in their places, and they are both concentric to a shaft, *a*, which has its bearings in the standards constituting the frame of the machine. On this shaft are applied two large spur-wheels, *C C'*, and two drums, *b*. The drums *b* are keyed on shaft *a* inside of the cases, and have secured to them springs *S*, which are wound around the drums, and their outer ends secured to their respective cases *B B'*.

Thin or ribbon springs are more or less imperfect and weak at points throughout their length, and when used singly the force exerted by their recoil will be irregular. To ob-

viate this objection I employ two or more ribbons, lying in contact with each other, as shown in Fig. 3. By this means one spring will re-enforce the other at weak points, and the springs will not be liable to break at such points.

The spur-wheels *C C'* are between the two spring-holding cases *B B'*, and between the two intermediate frame-standards *A<sup>1</sup> A<sup>2</sup>*, and are both acted on by the springs *S*. The wheel *C* engages with a pinion, *c*, on a shaft, *D*, and a spur-wheel, *d*, on this shaft engages with a pinion, *e*, on a winding-up shaft, *E*. The wheel *C'* engages with a pinion, *f*, on a short shaft, *g*, on which a spur-wheel, *F*, and a ratchet-wheel, *G*, are applied. (Shown in Fig. 1.) The wheels *f* and *G* are fast on their shaft, but the wheel *F* is loosely applied on its shaft, but caused to turn with it by the dog *i* engaging with the teeth of the ratchet-wheel *G*. The wheel *F* does not turn when winding up the springs. This wheel *F* engages with a pinion, *j*, on a shaft, *H*, which latter also carries a spur-wheel, *K*, that engages with a pinion, *l*, on a shaft, *J*. The shafts *a g H J* are all in the same vertical plane. On the shaft *J* is a friction-drum, *m*, and a balance-wheel, *K*, and from a pulley (not shown) on this shaft motion is transmitted for driving a sewing or other machine. *L L'* designate two friction-brakes; the upper one, *L*, is pivoted to the frame-standard *A<sup>1</sup>* at 2, and crosses the friction-drum *m* on shaft *J*, and has attached to it a treadle rod or chain, *p*, by depressing which with more or less force the operator sitting at the machine can regulate the speed thereof. When there is no force applied to the treadle a spring, *s*, will raise the brake *L* free from its drum *m* on shaft *J*. The shortest arm of the brake *L* lies across a cam, *n*, which is on a rod, *N*, by turning which cam *n* will force the brake hard down upon the small drum *m*. The spring-brake *L'* is secured at one end to a bar projecting from frame-standard *A*, and carried beneath the balance-wheel *K* and a cam, *n'*, on a rod, *N'*. This brake *L'* is held in contact with the wheel *K* by its own spring action, and by slightly turning the rod *N'* brake *L* can be freed from the wheel *K*. Rods *N N'* will have handles on them, located

in a convenient place for the attendant sitting at the machine.

I am aware that volute springs have been arranged in pairs and triplets, having one end of the series connected together. I lay no claim to such invention, inasmuch as the device and result are both different from mine; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a motor, constructed substantially as described, the brakes L L' and their arms *n n'*, the brake L having a trea-

dle-rod, *p*, attached to its free end, substantially as described.

2. The springs S, composed of two or more ribbons firmly united at both ends, and inclosed in a suitable case, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ELISHA SHIVER.

Witnesses:

S. D. STANCHFIELD,  
HENRY HAMMETT.