W. YOUNG.

Motors for Sewing-Machines.

No. 140,607. Patented July 8, 1873.

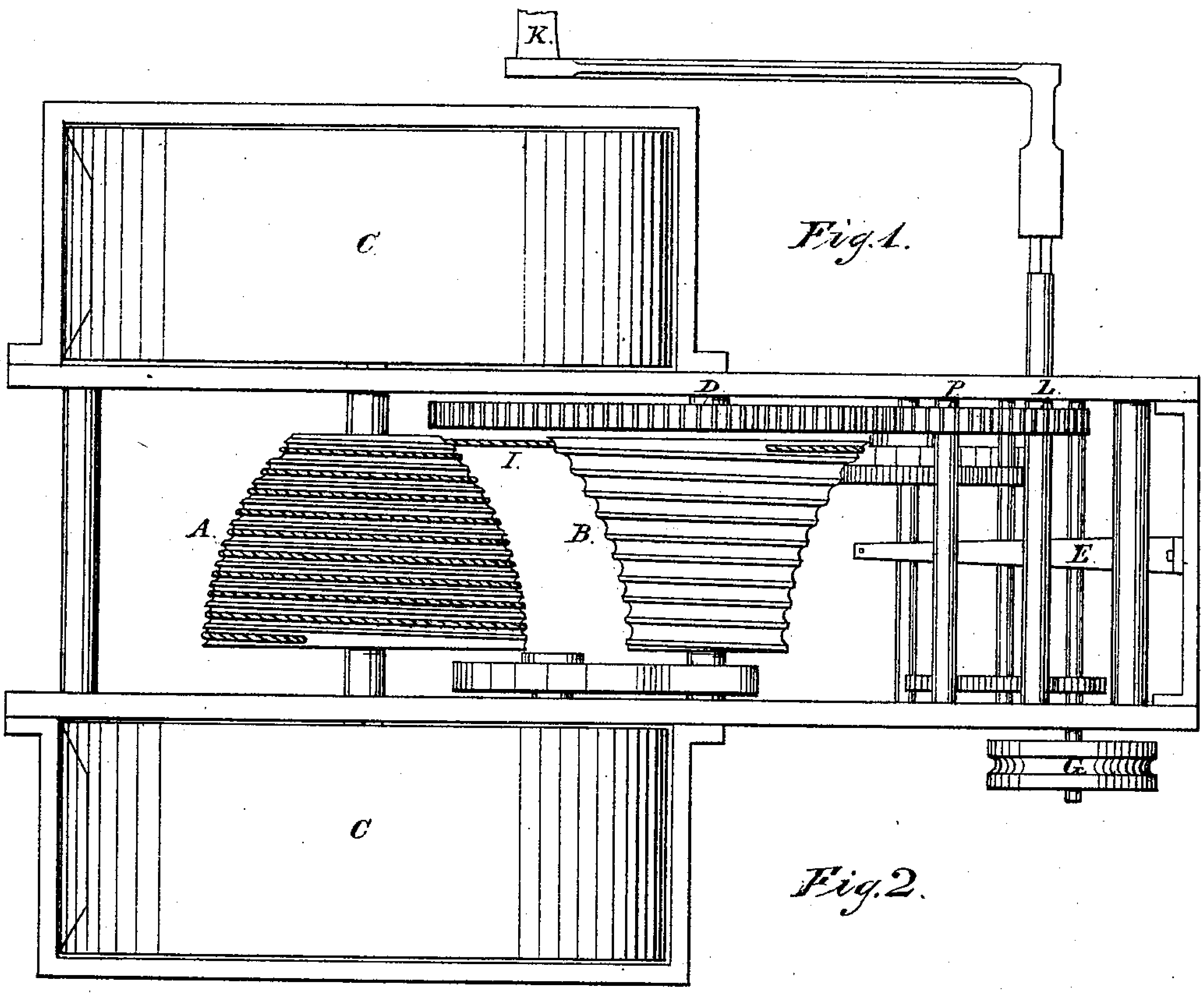
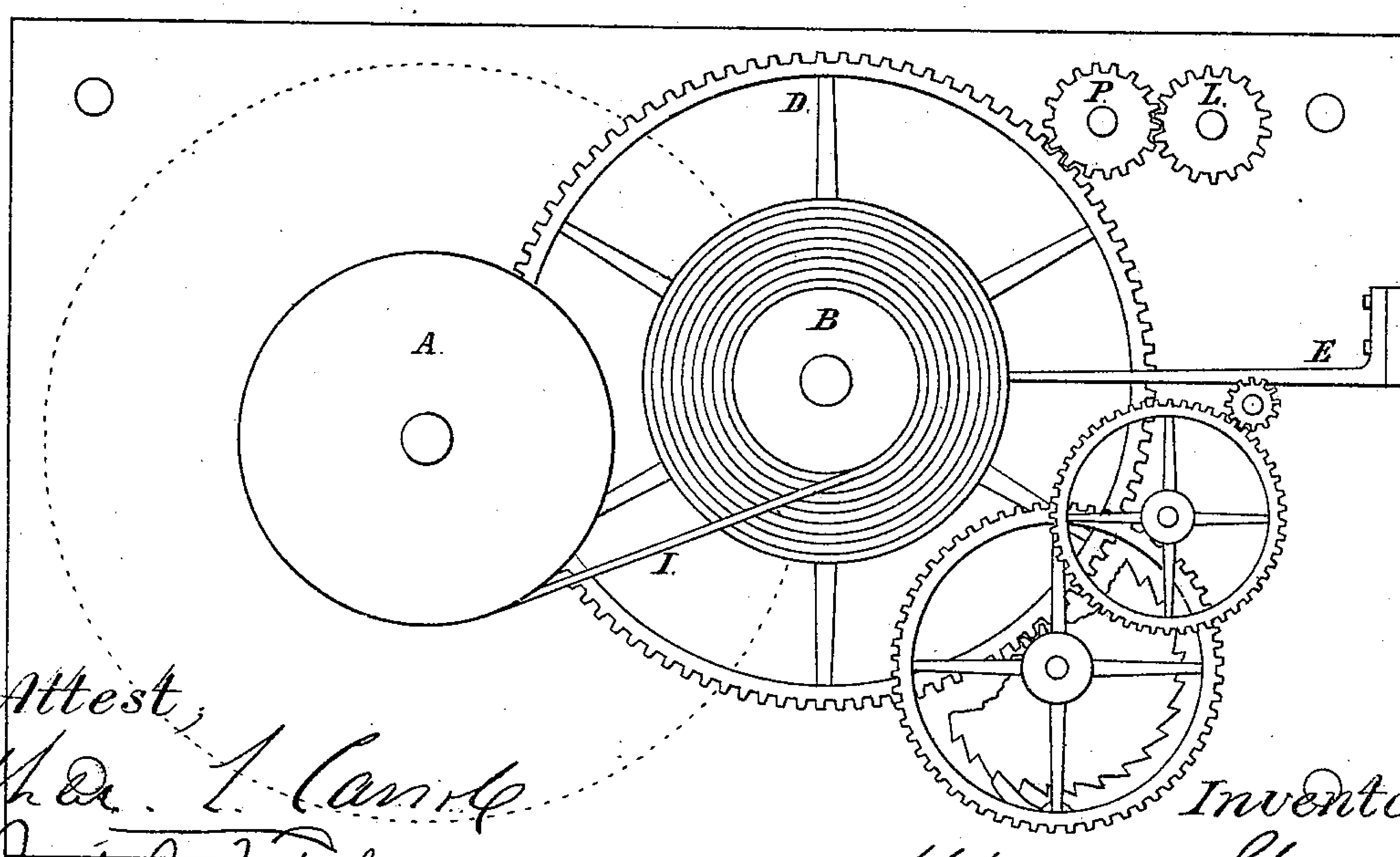


Fig.1.

Fig.2.



Attest;

Chas. L. Carroll

Jno. H. B. Latrobe

Inventor;

William Young.

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

WILLIAM YOUNG, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN MOTORS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **140,607**, dated July 8, 1873; application filed April 9, 1873.

To all whom it may concern:

Be it known that I, WILLIAM YOUNG, of Baltimore, Maryland, have invented a Motor for Sewing-Machines, of which the following is a specification:

As is well known, a coil of springs, when wound up, exerts its greatest power at the beginning of its action, its power decreasing as the coil unfolds or runs down. My invention aims at making the effective power practically uniform throughout.

In the accompanying drawing, Figure 1 represents a plan of a machine embodying my invention. Fig. 2 represents a side view; showing a train of wheels through which the power is applied.

The same letters represent the same parts in both drawings.

C C represent the springs of the motor. To make the effective power practically uniform throughout I employ two spirally-grooved conical drums, A and B, one, A, on the shaft carrying the springs, and the other, B, on the shaft carrying the main driving-wheel of the machine D, the smallest diameter of the shaft-drum A being opposite to the largest diameter of the drum B. Motion is communicated from the spring-drum A to the driving-drum B by a wire cord or a chain, I, one end of which, when the machine is run down, is made fast in the groove of the greatest diameter of the drum B. The cord then crosses to the smallest diameter of the spring-drum, and, following the groove, the end is made fast in the groove of the greatest diameter.

The machine is wound up by power applied, through the winch K, to the wheel L, between which and the main driving-wheel D there is interposed an idle-wheel, P, which, when the motor is used with a sewing-machine, is placed lengthwise of the table, or with its side to the operator, which enables the latter to wind forward in turning the winch instead of backward. Where the sewing-machine proper is placed lengthwise the motor must be placed crosswise under the table. Where the sewing-machine proper is placed across the table the motor will be lengthwise below it, and the winding must take place in front.

At the commencement of the winding up, when the least winding-up force is required, the spring being then uncoiled or run down, the wire cord on the greatest diameter of the driving-drum operates on the smallest diameter of the spring-drum; and when the greatest force is required to complete the winding up, the coil being then nearly condensed or quite wound up, the cord on the least diameter of the driving-drum operates on the greatest diameter of the spring-drum. Thus, the working diameter of one drum, so to call the diameter on which the coil is tangential, on the instant diminishing as the working diameter of the other increases, the power changes in its effects to meet the changing circumstances, and, theoretically, there would be an average of operating power developed from the springs until the coil ran down.

In practice, however, it is found that a better result can be obtained by making one of the drums concave on its grooved face and the other correspondingly convex; and, without intending to limit myself to any exact proportion, I have ascertained that in a conical drum whose length on the shaft is two and a half inches, with a greatest diameter of four inches and a least diameter of two inches, a hollowing of the one cone in the center to two and a half inches in diameter, with a corresponding swell on the opposite cone, produces satisfactory results and a greater uniformity of speed than when the drums are true cones.

While I prefer two spirally-grooved conical drums, as herein described, yet good results may be obtained with a cylindrical drum on the spring-shaft and a conical one on the driving-shaft, although, in this case, the taper on the cone, to produce the same effect, must be double that used where there are two conical drums.

With a view to regulate the speed of the machine to which my invention is applied, I use a brake, shown in the drawings at E, consisting of a flat elastic bar, which, by any convenient arrangement, is made to press, at will, upon the pulley-shaft, the peculiarity of the brake consisting in its being flat and elastic so as to press tangentially on the shaft on which it is intended to operate.

To stop the machine while in motion various modes may be adopted. I have found it convenient to use a brake operated from the sur-

face of the table upon the fly-wheel of the machine. The ordinary ratchet-wheel and pawl control the movement of the machine while being wound up. The removal of the pressure of the brake sets the machine in motion, and it continues at a practically-uniform speed, subject to the control of the brake, until it runs down.

While I describe an idle-wheel above, when the motor is applied to a sewing-machine, its use in other applications will depend upon circumstances then becoming apparent.

What I claim herein as new is—

1. The combination of a coil or coils of springs with two spirally-grooved conical drums, or one spiral and one cylindrical drum, a cord or chain uniting them, and a train of wheels, through which the power of the springs may be transmitted to the mechanism to be driven by it.

2. The combination, with the above combinations, of a brake, formed of an elastic spring-bar, pressing upon the pulley-shaft of the machine.

3. The idle-wheel above described, when used in the motor for the purpose of reversing the movement of the winch, as above described.

WILLIAM YOUNG.

Witnesses:

CHAS. F. CARROLL,

NIO HOT LATROBE.