(No Model.)

F. BRIGGS.

SPRING MOTOR FOR SEWING MACHINES.

No. 455,468. Patented July 7, 1891.

FIG. 1.

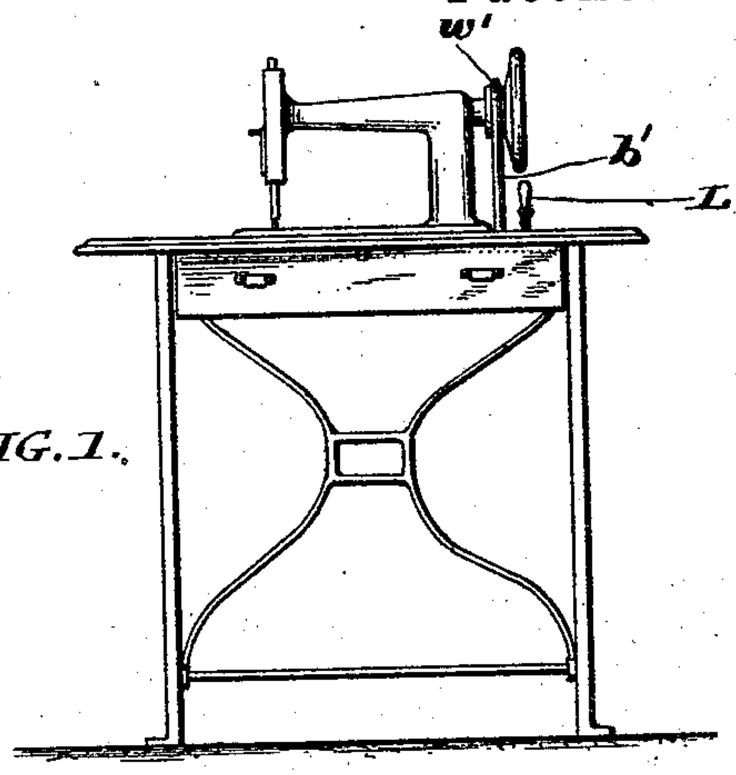


FIG. 2

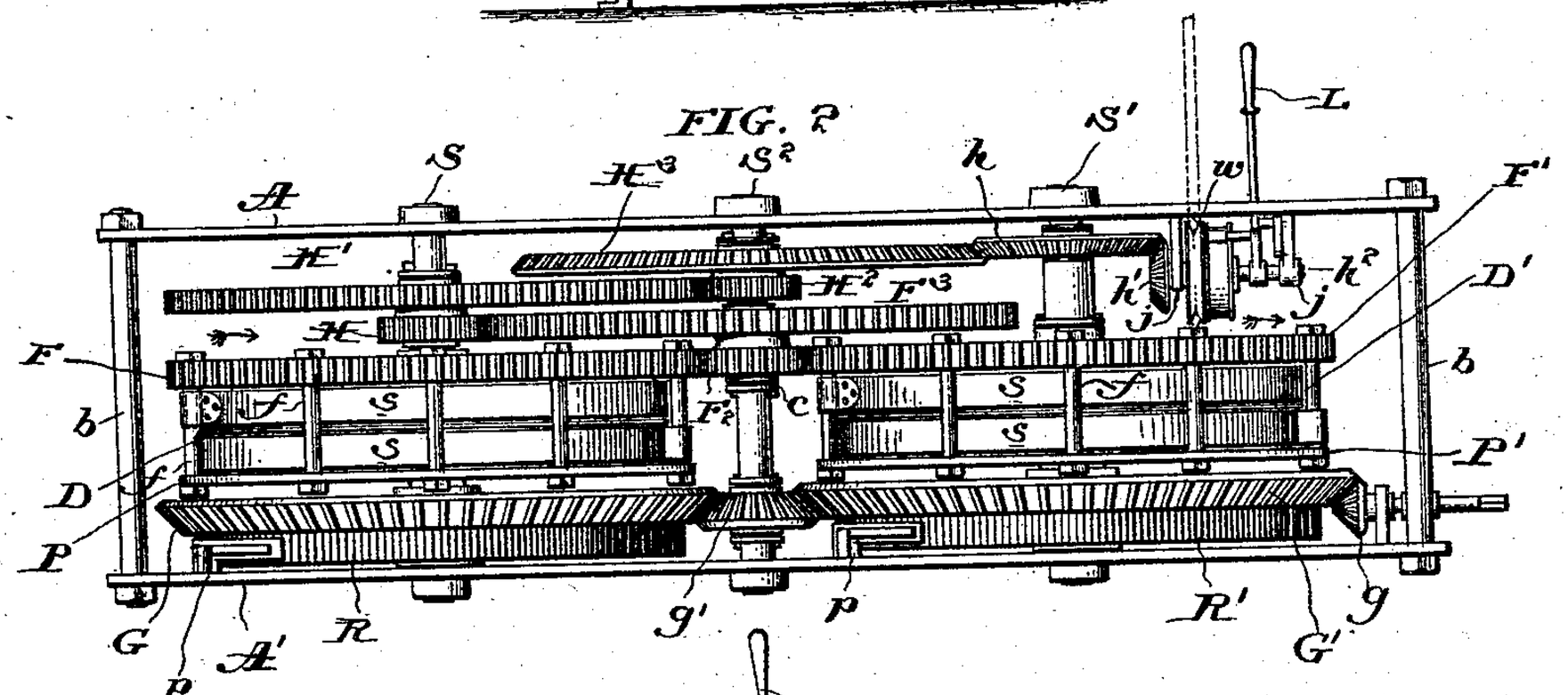


FIG. 3.

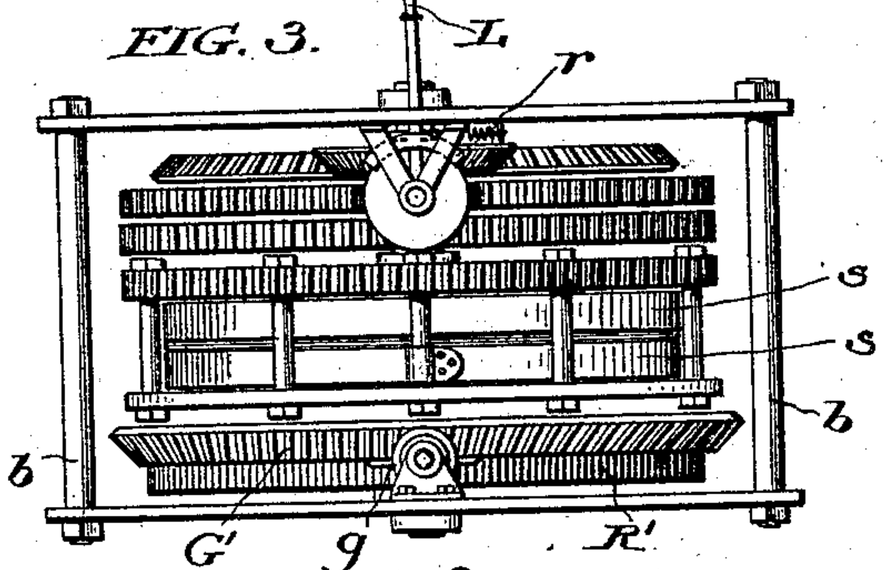
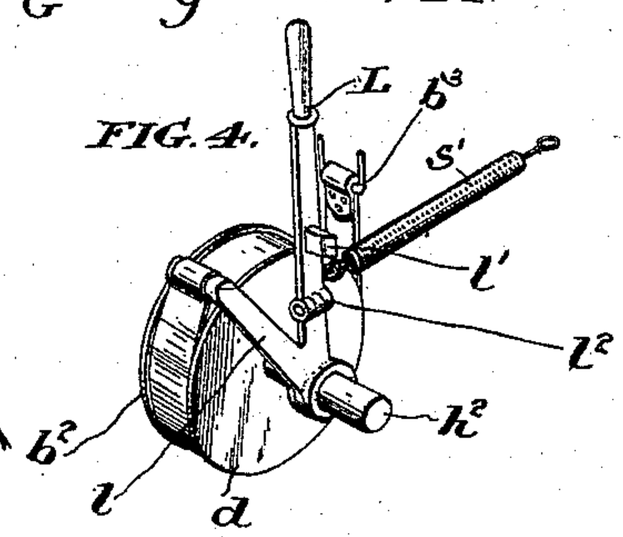


FIG. 5.

FIG. 6.

FIG. 7.

FIG. 4.



Attest:

Wm. A. Pike.

Geo. R. Van Dusen

Inventor:

Frank Briggs,

By his Attorneys

Horace Pettit.

UNITED STATES PATENT OFFICE.

FRANK BRIGGS, OF PHILADELPHIA, PENNSYLVANIA.

SPRING-MOTOR FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 455,468, dated July 7, 1891.

Application filed March 12, 1891. Serial No. 384,844. (No model.)

To all whom it may concern:

Be it known that I, FRANK BRIGGS, of the city of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Spring-Motors for Sewing-Machines and Such Small Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification.

My invention has relation to spring-propelled motors; and it consists in the device hereinafter particularly described.

The object of my invention is to provide a small compact motor of sufficient strength and velocity to operate sewing-machines and such like small machines, the speed of which may be readily regulated to any desired velocity and the motor started or stopped by the simple adjustment of a lever, and at the same time to provide a motor which can be produced and sold at a comparatively small cost.

My invention is adapted to be inclosed within a comparatively small compass, as underneath the table of the sewing-machine, and its casing may be made to represent a drawer, the front of which can be hinged to drop, allowing of access to the parts. The driving-pulley of the motor communicates the power to the pulley or band wheel of the sewing-machine by a band or belt in the ordinary manner, by which power is communicated to the machine. The regulating-lever is situated in a convenient position to the operator, by which the speed may be instantly controlled.

In the accompanying drawings similar letters of reference refer to similar parts throughout.

Figure 1 is a front elevation of a sewing-machine of ordinary construction having my improved motor attached thereto. Fig. 2 is a front elevation of the motor detached from its casing, showing the parts and connection in detail. Fig. 3 is an end elevation of the right end of the machine. Fig. 4 is a view in detail of a drum and band brake, with its connections detached. Fig. 5 shows the vertical shaft of the left-hand spring-drum detached. Fig. 6 shows the central vertical shaft. Fig. 7 represents the vertical shaft of the right-hand spring-drum detached.

A A′ represent the upper and lower walls or casing of the motor secured together and in position by the end bolts or posts *b*. In the construction shown two spring-drums D D′ are provided, one on each side of the center, horizontally arranged in vertical shafts S S′, respectively journaled in the walls A A′. Each of the said drums D D′, in the construction shown in the drawings, is provided with two spiral flat coiled springs *s*, secured at their outer ends at the circumference and at their inner ends to the axis of the drum or the vertical shaft and wound up from the center of the drum. Between the springs on each drum is preferably provided a plate or radiating arms to prevent the two springs from interfering with each other. The bevel gear-wheels G G′ are rigidly secured to the vertical shafts S S′, respectively. The springs *s* are wound by rotating the small bevel-gear *g*, by means of a key or crank, in the proper direction, which, gearing into the large bevel-gear G′, rotates the same, and consequently also the vertical shaft S′, to which it is rigidly secured, thus winding up the springs from the center, the drum D being also similarly operated at the same time in the same direction by being connected by means of the central small bevel gear-wheel *g′*. The pawls *p p′* engaging in the teeth of the ratchet-wheels R R′, which are rigidly secured to the gear-wheels G G′, hold the said shafts S S′. The frame-work of the drums D D′, composed of the plates P P′ and the gear-wheels F F′, which are secured together by the bolts *f* or by other suitable means, turns freely on the shaft S S′, and is driven in the direction indicated by the arrows by the unwinding of the springs. The combined force of the springs provided on each drum is communicated by the gear-wheels F F′ to the center small gear-wheel F^2, which is rigidly connected with the large gear-wheel F^3, both adapted to revolve on the fixed vertical shaft S^2, rotating in the opposite direction to the gear-wheels F F′ and held in position by a collar *c*. From the gear-wheel F^3 the power is communicated to the small gear-wheel H, adapted to rotate on the vertical shaft S, which gear-wheel in

turn, being rigidly affixed to the large gear-wheel H′, rotates it in the opposite direction to the gear-wheel F^3. Power is thence communicated to the small gear H^2 and the gear H^3, both of which are rigidly secured together, rotate on the vertical shaft S^2, and are operated in a direction the reverse to that of the gear-wheels H H′. The sets of gear-wheels F^2 F^3, H H′, and H^2 H^3, and also bevel-wheels g' and h, are loose on their axles or shafts and turn thereon, being held in their horizontal position by fixed collars, shoulders, or pins provided on the said shafts. Pins or collars may also be provided above each of the said horizontal wheels on their respective shafts to prevent them from rising up and becoming disengaged from the gearing. From the bevel gear-wheel H^3 power is communicated to the smaller bevel-wheel h, similarly adjusted to its vertical shaft and adapted to rotate thereon, and from thence to the vertical bevel-wheel h', secured rigidly on the horizontal shaft h^2, journaled in the journal-bearings j, suitably attached to the casing. A belt, pulley, or grooved wheel w is provided on the shaft h^2, which communicates the power to the small pulley or grooved wheel w', provided on the sewing-machine or other machine to be driven by means of a belt or cord b'. A drum or band-wheel d is also rigidly provided on the shaft h^2 as a speed-regulating device of economical construction, and a band b^2 secured at one end to the frame of the motor or to a projection or dependent therefrom, as at b^3. The other end of the band b^2, which is preferably metal, is secured to the end of a lever or arm, such as shown in the drawings, or to any other suitable device for like purpose. As the lever L is pulled forward, the band b^2, attached to the end of the auxiliary arm l, is released either partially or entirely from frictional contact with the surface of the drum d and the shaft h^2 and pulleys allowed to rotate slowly or to full speed, as desired. Upon the lever L being released the spring s' returns the lever L to its normal condition, puts on the brake, and stops the machine. A pawl l' is provided on the lever L, adapted to engage in the rack r, so that the lever L may be retained in any desired position, the said lever L being pivoted, as at l^2, to allow of a lateral motion when engaging the rack r. The shaft S^2 is rigidly fixed to the casing-walls. The shafts S S′ are adapted and constructed to revolve in one direction only and only when winding. Consequently both of these shafts are also practically fixed shafts and act as rigid supports and bearings for the horizontally-disposed wheels, which are journaled and rotate upon the same.

I have herein described a particular construction of brake device as a desirable construction; but I do not limit myself to this form, as any suitable brake device may be employed with my herein-described construction of improved motor which may be capable of regulating and controlling the speed of the motor—such as, for instance, the governor described in my Letters Patent, No. 437,280, issued to me September 30, 1890, or other brake or governor.

Although my improved compact motor is specially adapted to sewing-machines, and I have herein described it as applied thereto, I do not limit myself to such application, as it may be applied to many light-running machines or small lathes, &c.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a spring-motor, revoluble drums, springs mounted in said drums, toothed gear-wheels mounted on and connecting said drums with a common shaft and communicating the combined power thereto, gear-wheels provided on said common shaft, and intervening gearing adapted to communicate the power to the driving gearing or pulley, a governor or brake connected with the gearing for regulating the speed of the motor, and winding mechanism consisting of a large gear-wheel provided on each drum, said gear-wheels communicating with each other and with a single crank, substantially as described.

2. In a spring-motor, revoluble drums, springs mounted in said drums, said drums loosely journaled on their respective shafts, said springs secured at their outer ends to the drum and at their inner ends to the rotating axis, large gear-wheel rigidly attached to said axis and geared to the other drum or drums for winding simultaneously all the drums, large toothed gear-wheel mounted on each drum, small gear wheel or wheels connected with the gearing on the drums, a shaft carrying small gear-wheels, said shaft adapted to receive the combined force of all the springs in each of said drums, gearing for communicating said force to a device to be driven, and winding mechanism communicating with each drum, connected together and operated by a single crank, and a brake connected with the gearing, for the purpose substantially as described.

3. A spring-motor having two drums, each drum provided with flat coiled springs and large gear-wheels G G′ F F′, adapted to engage in smaller gear-wheels provided on a common shaft S^2, and gear-wheel F^2, provided thereon and engaging with said drums, and mechanism, substantially as described, for communicating the power to the driving pulley or gearing, and a brake for regulating and controlling the speed of the motor, connected with such mechanism and winding mechanism, substantially as described.

4. A spring-propelled motor for operating a machine, said motor provided with two drums, a series of springs mounted in each drum, toothed gear-wheels mounted on said drums, small gear-wheels connected with the gearing on the drums, a shaft carrying small gear-wheels, said shaft adapted to receive the combined force of all the springs of each of

the drums, gearing for communicating said force to the machine to be driven, a drum or band-wheel connected with the driving-gearing, a band, a lever adapted to operate said band frictionally upon said drum for regulating the speed of the motor, and winding mechanism communicating with each drum and connected with each other and with a single crank for winding, as set forth.

5. A spring-motor having two drums, each drum provided with flat coiled springs, large gear-wheels G G′ F F′, adapted to engage in smaller gear-wheels provided on a common shaft S^2, gear-wheel F^2, provided thereon and engaging with said drums, mechanism, substantially as described, for communicating the power to the driving pulley or gearing, band-brake device for regulating and controlling the speed of the motor, connected with such mechanism, band-wheel *d*, rigidly affixed to the shaft h^2, band b^2, partially encircling said band-wheel, and lever L, and parts adapted to operate said band frictionally upon said band-wheel and winding mechanism, substantially as described.

6. A spring-motor having drums D D′, gear-wheels G′ G F F′, flat coiled springs *s*, provided on said drums, ratchet-wheels R R′, small gear-wheel *g*, pawls *p*, small gear-wheels *g′* F^2, provided loosely on vertical shaft S^2, adapted to gear into the large gear-wheels G′ G F′ F, respectively, gear-wheel F^3, rigidly attached to small gear-wheel F^2, gear-wheels H H′, rigidly secured together, gear-wheels H^2 H^3, rigidly secured together, said gear-wheel H adapted to engage in large gear-wheel F^3, gear-wheel H^2 adapted to engage in large gear-wheel H′, beveled gear-wheels *h* and *h′*, said gear-wheel *h* adapted to gear into said large gear-wheel H^3, small gear-wheel *h′*, rigidly attached to the horizontal shaft h^2, journaled at *j*, brake for regulating and controlling the speed of the motor connected with the gearing, pulley *w*, and shafts, casing, and parts securing and containing said mechanism, substantially as described.

7. A spring-motor having drums D′ D, gear-wheels G′ G F F′, flat coiled springs *s*, provided on said drums, ratchet-wheels R′ R, small gear-wheel *g*, pawls *p*, small gear-wheels *g′* F^2, provided loosely on vertical shaft S^2, adapted to gear into the large gear-wheels G′ G F′ F, respectively, gear-wheel F^3, rigidly attached to small gear-wheel F^2, gear-wheels H H′, rigidly secured together, gear-wheels H^2 H^3, rigidly secured together, said gear-wheel H adapted to engage in large gear-wheel F^3 and gear-wheel H^2 adapted to engage in large gear-wheel H′, beveled gear-wheels *h* and *h′*, said gear-wheel *h* adapted to gear into said large wheel H^3 and small gear-wheel *h′*, the gear-wheels F^2, F^3, H, H′, H^2, H^3, *g′*, and *h* all loosely journaled in their respective shafts, horizontal shaft h^2, journaled at *j*, and drum *d*, secured on said shaft h^2, band b^2, a lever L, operating said band on said drum, constructed and secured as described, pulley *w*, and shafts, casing, and parts securing and containing said mechanism, substantially as described.

In witness whereof I have hereunto set my hand this 10th day of March, A. D. 1891.

FRANK BRIGGS.

Witnesses:

WILLIAM M. STEWART, Jr.,

HORACE PETTIT.