

W. S. SHOEMAKER.
VOLUTE SPRING MOTORS.

No. 170,310.

Patented Nov. 23. 1875.

FIG. I

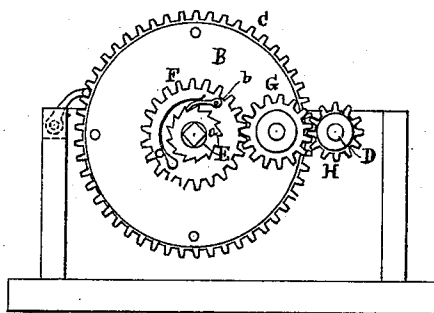


FIG. II

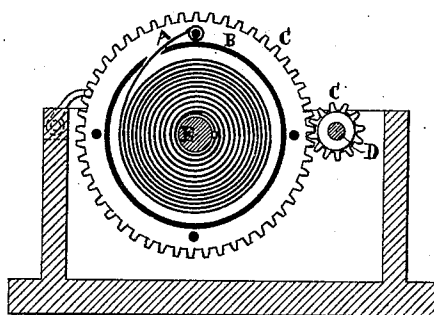
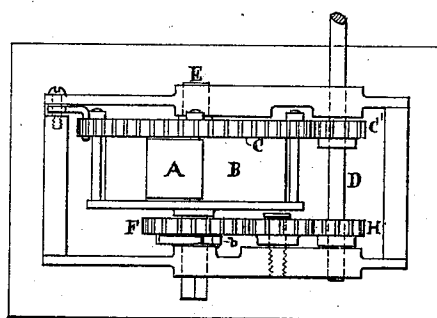


FIG. III



WITNESSES.

Wm W. Fowson
J. B. Greene

INVENTOR.

William S. Shoemaker
by C. H. M. Howard
his Atty.

UNITED STATES PATENT OFFICE.

WILLIAM S. SHOEMAKER, OF BALTIMORE, MARYLAND, ASSIGNOR OF
TWO-THIRDS HIS RIGHT TO SYDNEY C. LONG, OF SAME PLACE.

IMPROVEMENT IN VOLUTE-SPRING MOTORS.

Specification forming part of Letters Patent No. **170,310**, dated November 23, 1875; application filed
November 4, 1875.

To all whom it may concern:

Be it known that I, WILLIAM S. SHOEMAKER, of the city of Baltimore and State of Maryland, have invented certain new and useful Improvements in Volute-Spring Motors, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention relates to a novel method of applying the ordinary volute spring in the transmission of motion to mechanism of various kinds; and has for its object the utilization of the entire elastic force of the said spring, as hereinafter fully described.

The usual method of applying the volute spring, to operate mechanism, is to make either the inner or outer end of the said spring stationary, as far as it relates to the moving of the mechanism, the said stationary end receiving the reactionary pressure of the spring while performing its functions, the movable end only of the said spring being utilized directly, to cause the operation of the mechanism aforesaid.

In my invention, one end of the spring is connected to a shaft, by means of which the said spring is compressed or wound up, and which shaft, in the uncoiling of the said spring, is turned, and thereby transmits motion, through the medium of suitable gearing, to a second shaft, adapted to do useful work. The other end of the spring is attached to a drum or casing of the spring, which is fitted with gearing, also operating upon the working-shaft, to influence it in the direction which it takes through the medium of the gearing aforesaid.

In the further description of my invention which follows due reference must be had to the accompanying drawing forming a part of this specification, and in which—

Figure 1 is a side view of the invention, with a portion of the frame removed. Fig. 2 is a section of the same, showing the spring; and Fig. 3, a plan of the invention.

Similar letters of reference indicate similar parts of the invention in all the views.

A represents the spring, and B the casing of the same, to which is secured the gear-wheel C, adapted to engage with the pinion

C' keyed to the shaft D. The outer end of the spring A is fastened to either the casing B or to the gear-wheel C, and, through these wheels, transmits movement to the shaft D aforesaid. The inner end of the spring A is connected to the shaft E, which has the toothed wheel F running loosely thereon, but adapted to have a movement in one direction, in common with the said shaft E, by means of a ratchet-wheel, *a*, and pawl *b*. The movement of the wheel F is also transmitted to the shaft D, but through the medium of the idler-wheel G, which engages with the wheel H keyed to the shaft D.

It will be seen that, upon the spring being wound up, both ends thereof communicate motion, in a common direction, to the shaft D, which may be used as the prime mover of mechanism designed for various purposes.

My invention is applicable to all the uses for which volute-spring motors are employed, the advantages consisting in that the entire elastic force inherent in the spring is utilized for a useful purpose, viz., the revolving of the shaft D.

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

1. The spring A, the two ends of which are connected by means of gearing to the shaft D and moved in the uncoiling of the said spring in such manner as to revolve the said shaft D in a common direction, substantially as described.

2. The spring A and shaft E, with the ratchet-wheel *a* thereon, in combination with the pawl *b*, gear-wheels F, G, and H, and shaft D, substantially as and for the purpose specified.

3. The wheel C and casing B connected therewith, spring A, having its ends secured, respectively, to the wheel C and shaft E, in combination with said shaft E, wheel F, idler-wheel G, and shaft D, having thereon the pinion C' and wheel H, substantially as and for the purposes herein specified.

In testimony whereof I have hereunto subscribed my name this 2d day of November, A. D. 1875.

WILLIAM S. SHOEMAKER.

Witnesses:

WM. T. HOWARD,
W. W. WHARTON.