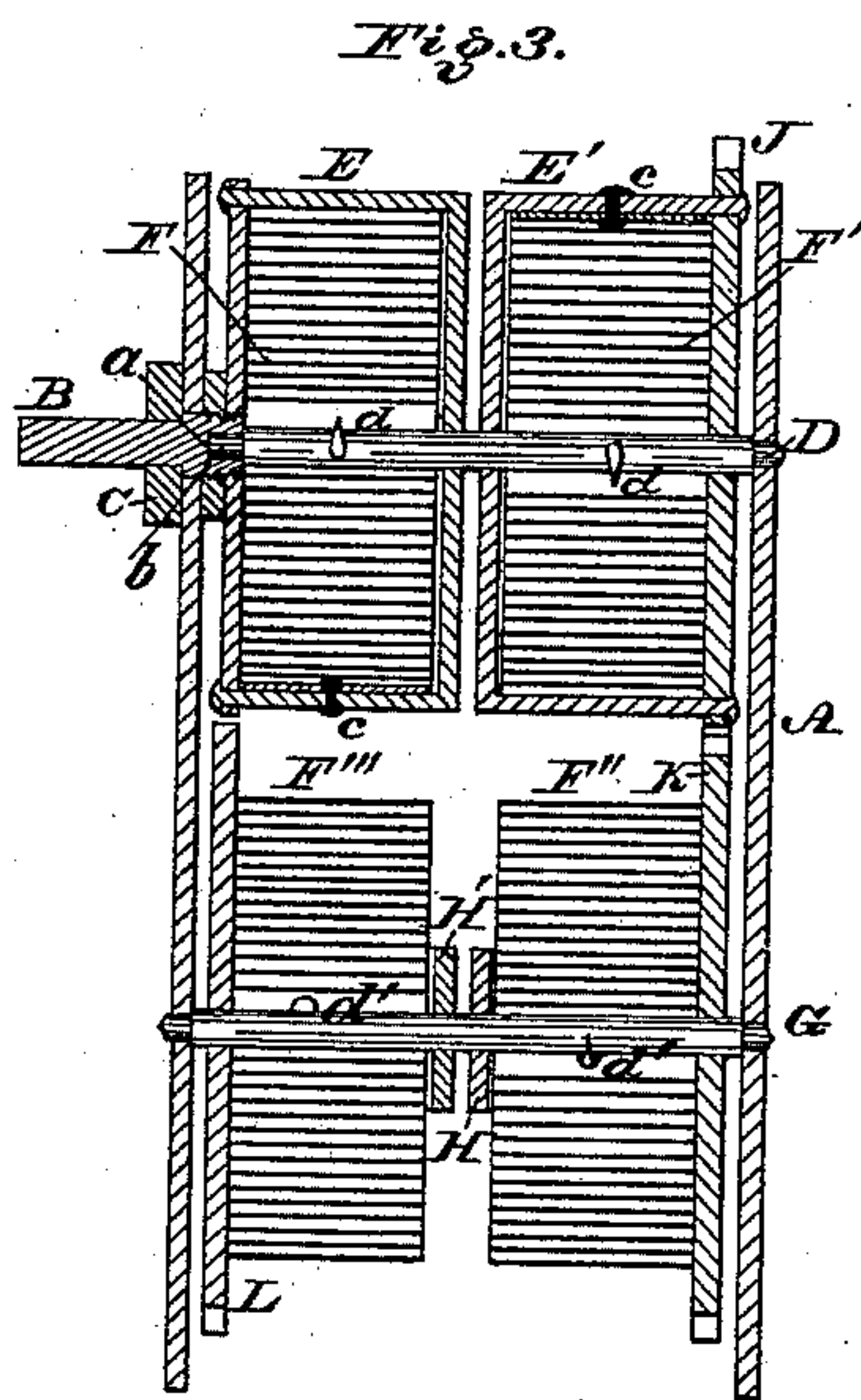
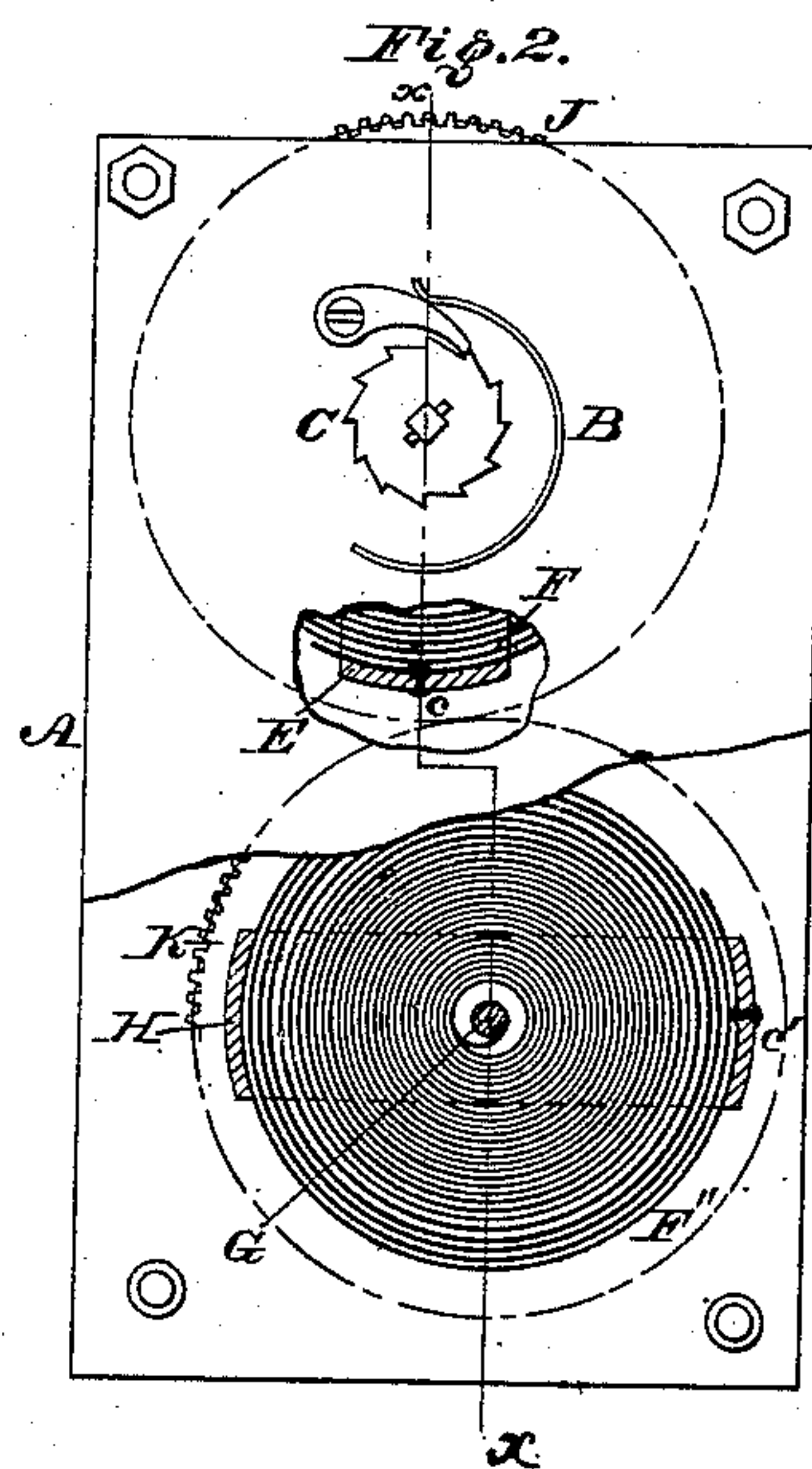
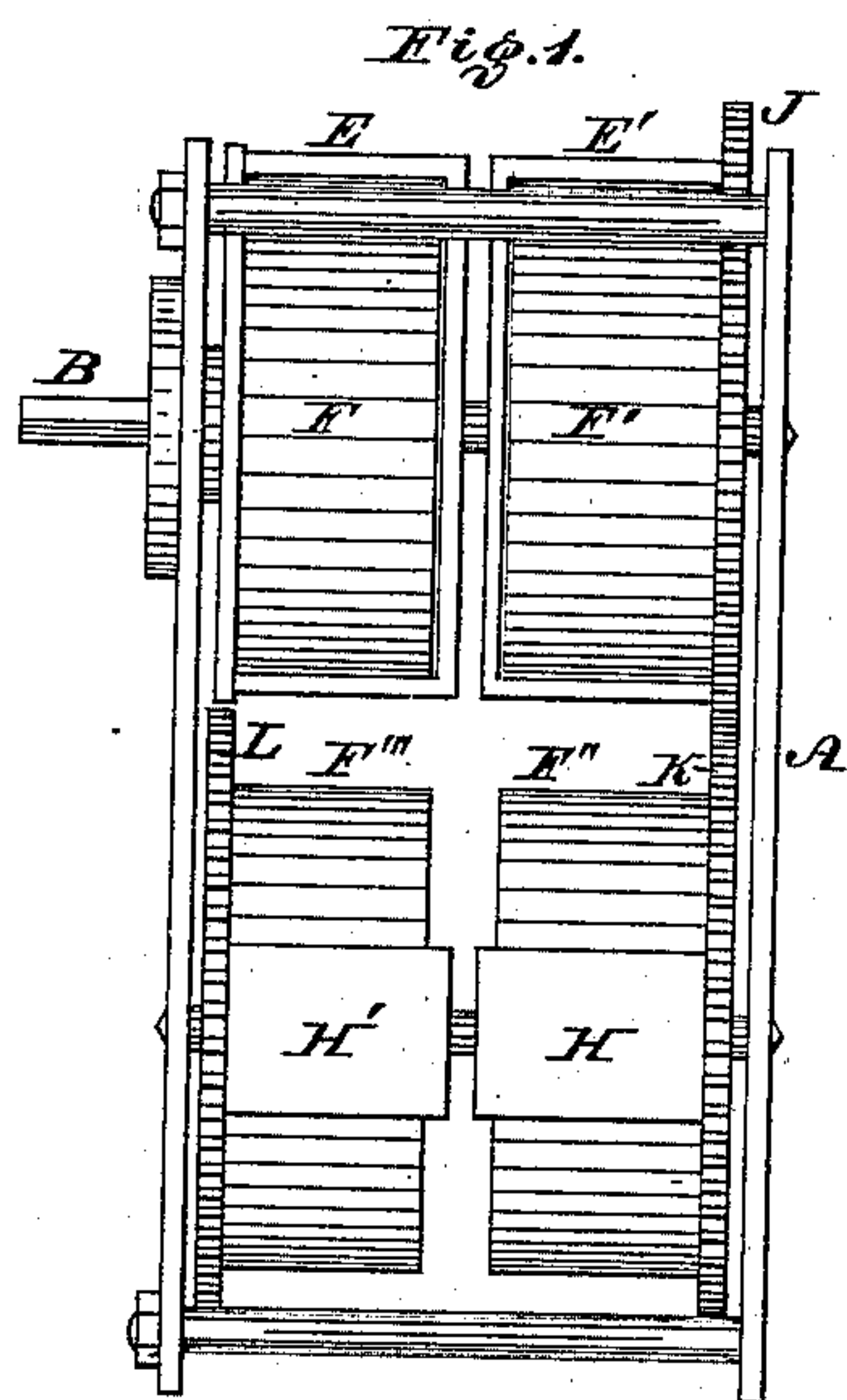


(No Model.)

D. SHIVE.  
SPRING MOTOR.

No. 279,827.

Patented June 19, 1883.



Witnesses:  
J. P. Grant,  
H. D. Kircher

Inventor:  
David Shive,  
by John A. Diederheim  
Attorney.



# UNITED STATES PATENT OFFICE.

DAVID SHIVE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO B. F. DU BOIS, OF SAME PLACE.

## SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 279,827, dated June 19, 1883.

Application filed May 4, 1881. Renewed April 17, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID SHIVE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Spring-Motors, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of the motor embodying my invention. Fig. 2 is a face view, partly broken away and sectional. Fig. 3 is a section in line *xx*, Fig. 2, the arbors being uncut.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a spring-motor having a winding-stem formed with a socket, into which projects a tenon or journal on the end of the arbor of the springs and barrels, said socket being free to turn on said tenon, for the purpose of winding the spring attached to the first barrel.

It also consists of two or more sets of arbors, barrels, and springs, in combination with connected barrels.

It also consists in making the barrels in skeleton form.

It also consists of a combination of arbors, springs, and barrels, said springs winding on the arbors, respectively, from their outer to their inner ends and from their inner to their outer ends.

Referring to the drawings, A represents a frame for supporting the various parts of the motor.

B represents a winding-post, which is mounted on the frame A, and provided with a ratchet-wheel, C, with which engages a pawl connected to the frame.

On the inner end of the post B is a socket, *a*, into which projects freely a tenon or journal, *b*, on one end of an arbor, D, or vice versa, the other end of said arbor being mounted on the frame A.

Fitted loosely on the arbor D, side by side, are two barrels, E E', containing reversely-coiled springs F F', one end of each of which is connected to its respective barrel by a spur, *c*, thereon, and the other end to the arbor by a spur, *d*, on the same. The inner end of the winding-post B is screwed into or otherwise

firmly secured to the adjacent head of the barrel E, so that said barrel and post move as one.

G represents an arbor, which is mounted on the frame A and extends parallel with the arbor D. Fitted loosely on said arbor G, side by side, are two barrels, H H', containing reversely-coiled springs F'' F''', one end of each of which is connected to its respective barrel by a spur, *c'*, thereon, and the other end to the arbor by a spur, *d'*, on the same.

J represents a spur-wheel, which is attached to the barrel E', and meshes with a spur-wheel, K, attached to the barrel H.

L represents a spur-wheel, which is attached to the barrel H', and adapted to communicate the power of the springs or serve as the driving-wheel of the motor.

When the stem B is properly rotated—in the present case to the right—the barrel E winds the spring F from the outer end inwardly. As said spring is connected to the arbor D, rotary motion is imparted to said arbor in a manner different from and independent of the motion of the barrel E, this being permitted by means of the free connection of the arbor with the winding-stem B, the said spring F' being wound from the inner end and giving motion to the barrel E', and consequently to the connected wheel J thereof. Motion is thus imparted to the wheel K and the barrel H, and the spring F'' of the latter is wound from its outer end by said barrel upon the arbor G, which, rotating, winds the spring F''' from its inner end and imparts motion to the barrel H', and consequently to the attached wheel L, which, as has been stated, is the driving-wheel of the motor; but the number of arbors, barrels, and springs may be increased as desired. Of course the rotation of shell E by means of stem B will wind spring F considerably before the strain on said spring is transmitted to arbor D. The resistance of spring F will counterbalance to some extent the action of said spring F on said arbor, and thus prevent it from turning too easily.

It will be seen that the several springs wind at the same time and all run down at the same time; but the power of tension is that of one spring, while the duration is as the number of springs.

In order to form the barrels light and cheap,

I cut them away or construct them in skeleton form, as shown.

Owing to the free or broken connection of the arbor D and winding-stem B by means of the journal *b* and socket *a*, as has been stated, I am enabled to wind two springs on the same arbor and have independent action of the springs, whereby, if the winding were from the center, the springs would act in conjunction.

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

1. In a spring-motor, the winding-stem and socket, in combination with the shell E, turning with said socket, the arbor D, journaled in said socket, and the spring F, attached at one

end to said socket and at the other to said arbor, substantially as set forth.

2. In a spring-motor, two or more sets of arbors, barrels, and springs, in combination with connected gear-wheels, substantially as and for the purpose set forth.

3. A winding-post, an arbor connected freely therewith and carrying barrels with springs, a parallel arbor carrying barrels with springs, and connected gearing, combined and operating substantially as and for the purpose set forth.

DAVID SHIVE.

Witnesses:

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