

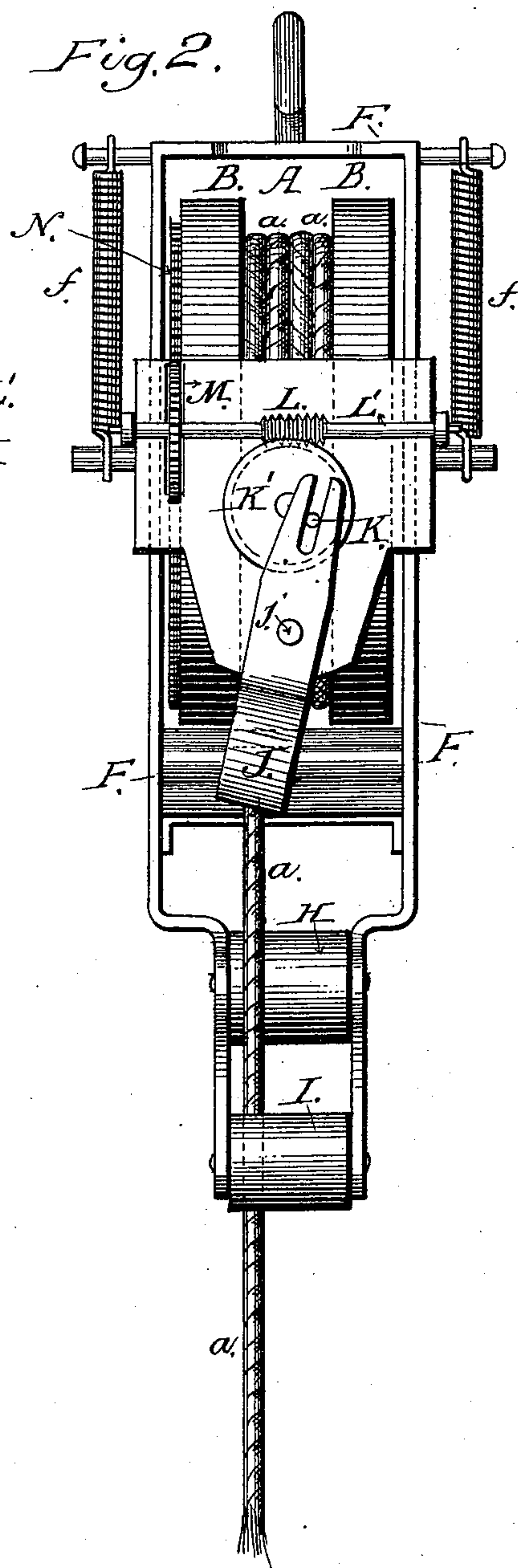
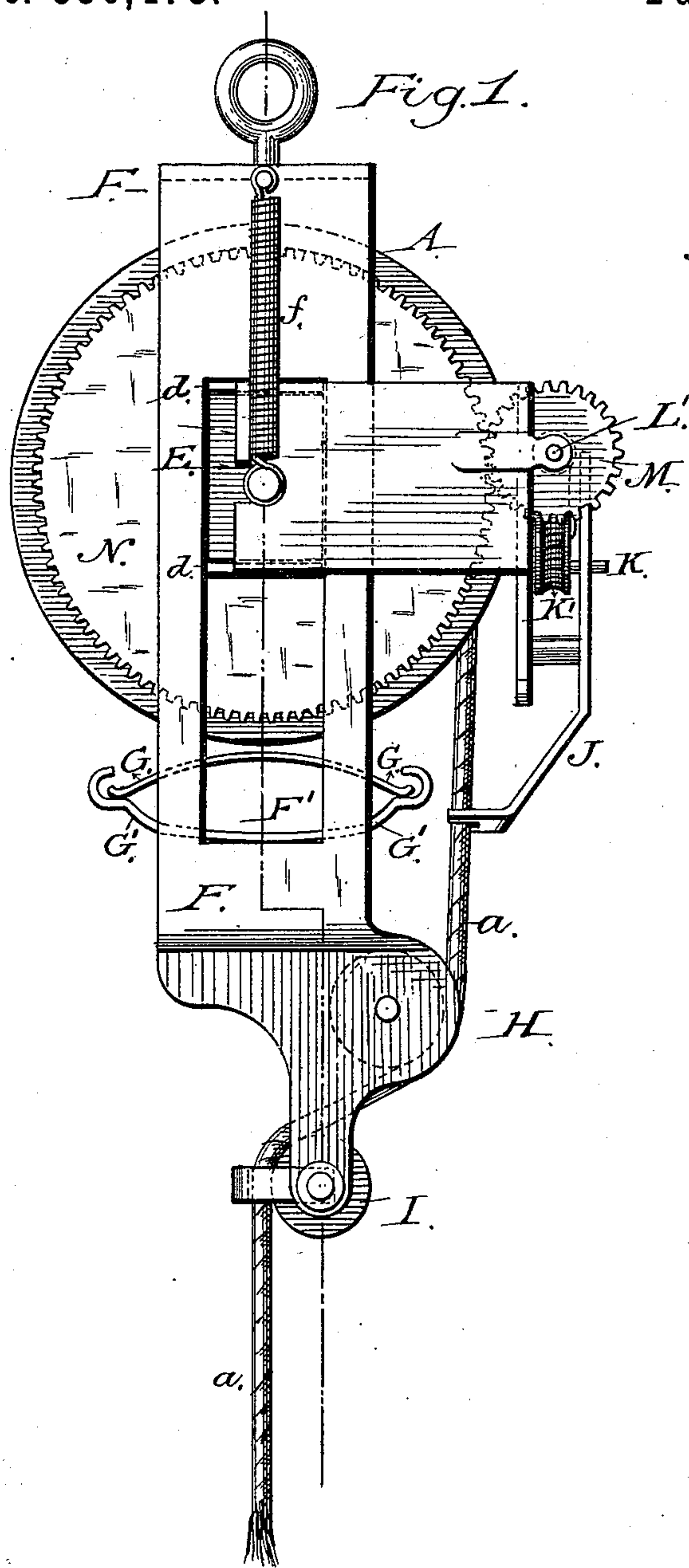
(No Model.)

2 Sheets—Sheet 1.

J. BIEN.
FIRE ESCAPE.

No. 350,473.

Patented Oct. 12, 1886.



Witnesses

J. W. Fowler
H. B. Applewhite

Inventor

Joseph Biew

By *his* Attorneys

A. A. Evans & Co

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

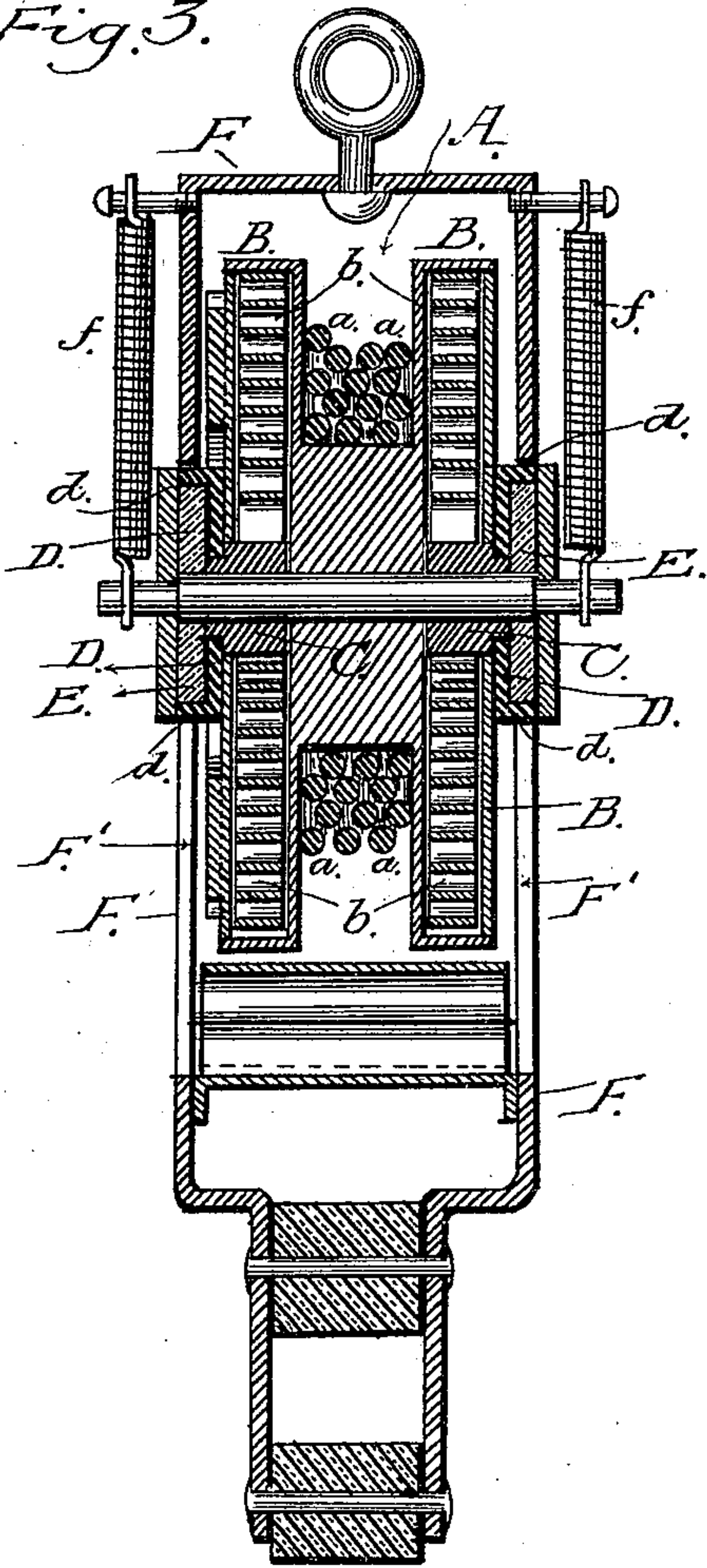


Fig. 4.

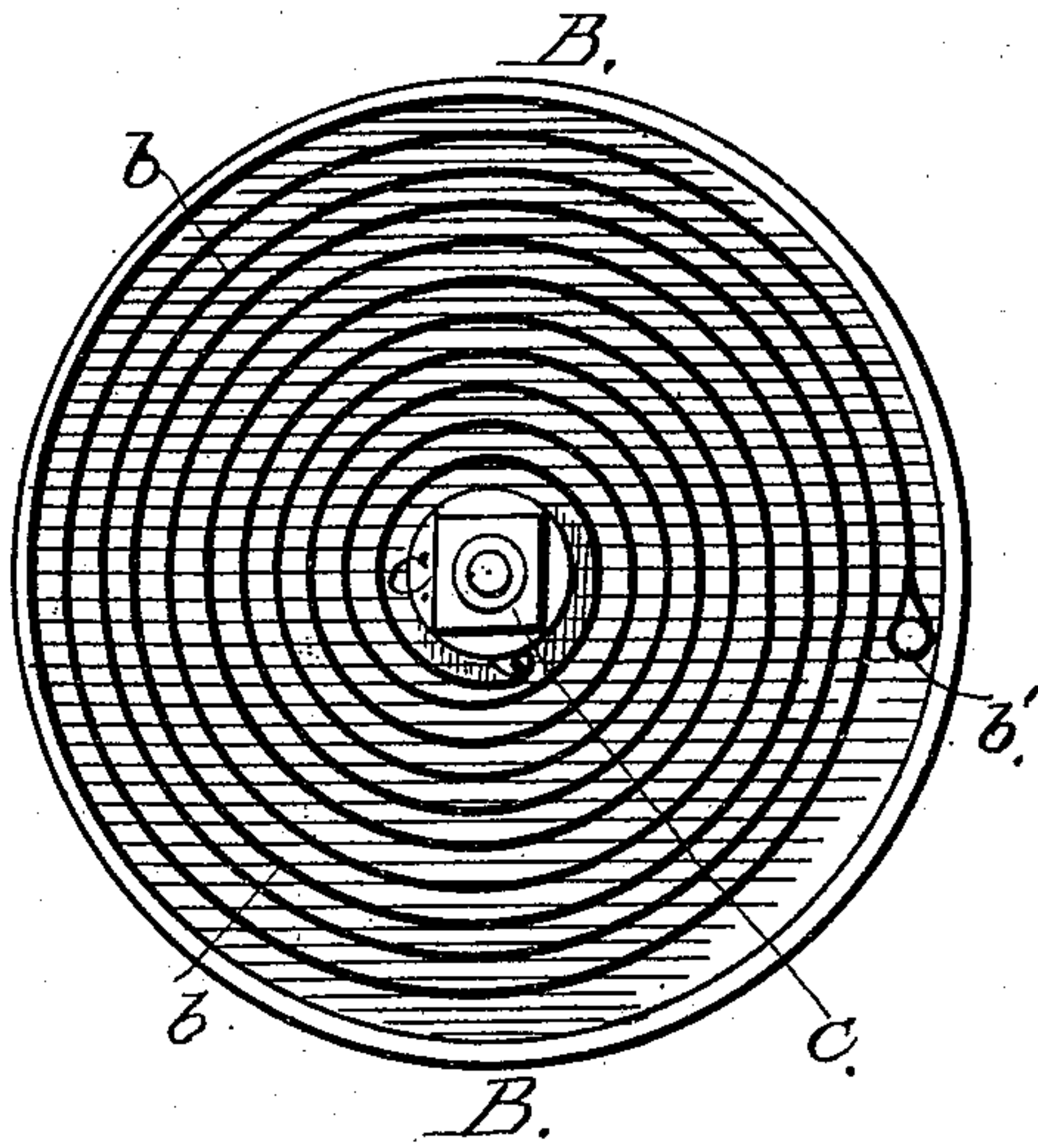


Fig. 5.

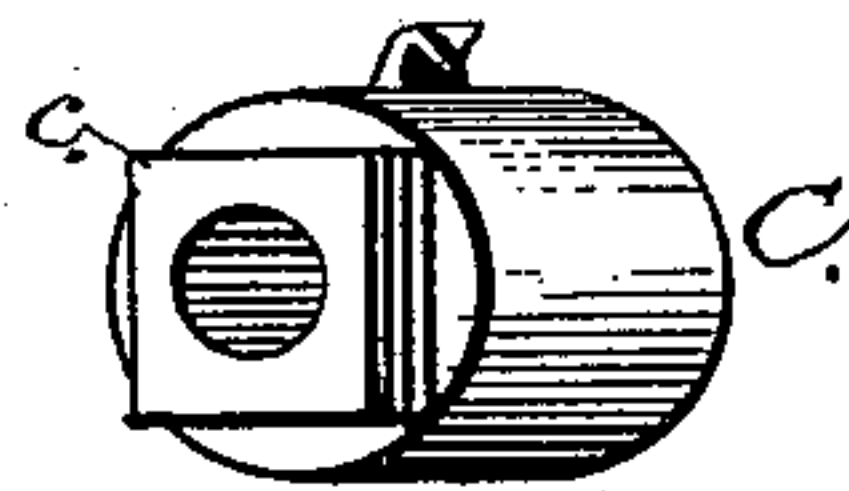


Fig. 6.

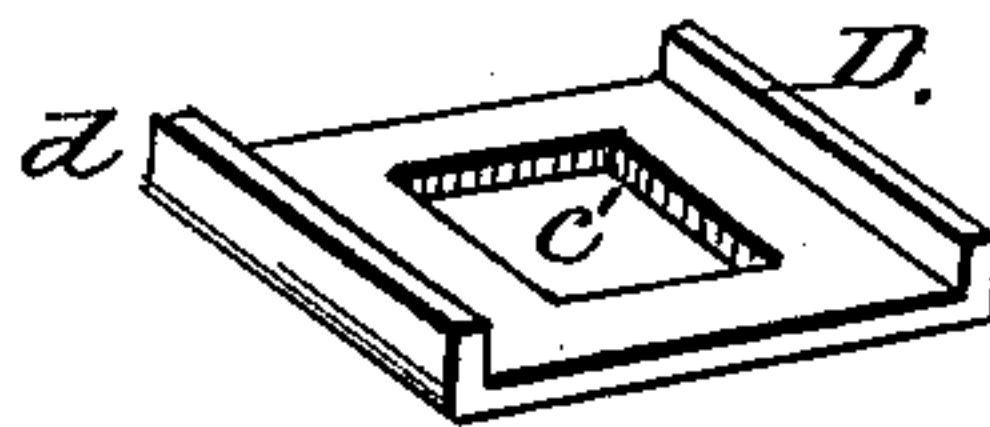
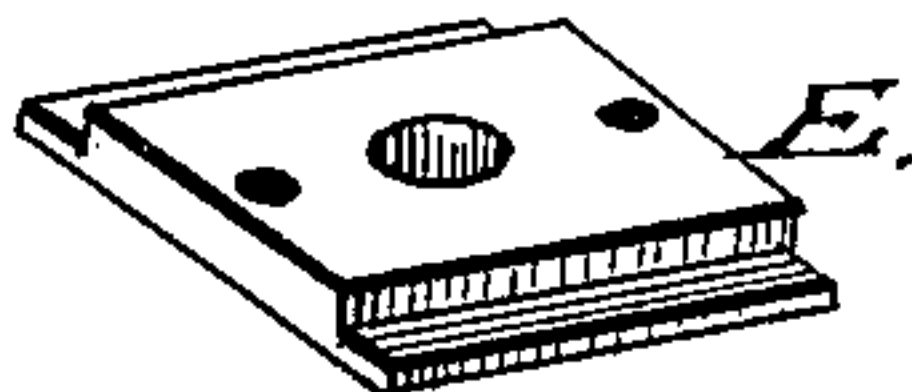


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH BIEN, OF NEW YORK, N. Y.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 350,473, dated October 12, 1886.

Application filed February 4, 1886. Serial No. 190,778. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BIEN, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Fire-Escapes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a side elevation of a fire-escape with my improvements attached. Fig. 2 is a front view of same. Fig. 3 is a vertical section through *xx* of Fig. 1. Fig. 4 represents one end of the drum with casing removed and spring exposed. Figs. 5, 6, and 7 are details to be referred to.

My invention relates to that class of fire-escapes known as "friction" fire-escapes, and its object is to provide such an escape as will be always fixed and ready for use, requiring no adjustment, will automatically adjust itself to the weight being lowered, and will automatically reset the escape ready for use without the intervention of a crank.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the manner in which I have carried it out.

In the drawings, A represents a double-flanged drum, around which is wound the cord *a*, made of any suitable material; or it may be a flat metal tape, if desired. On each side of the drum I construct a metal casing, B, in which is placed a watch-spring, *b*, one end of which is secured to the inside of the casing at *b'*, and the other end is secured to the loose collar C on the axle of the drum. This loose collar C (see Fig. 5) is provided with rectangular shoulders *c*, adapted to receive the washer D, Fig. 6, having a rectangular opening, *c'*, fitting upon the said shoulders, as shown in section in Fig. 3. The washer D is also provided with the flanges *d d*, between which fits the guide-plate E, Fig. 7, as shown in section in Fig. 3. These guide-plates E E furnish bearings for the journals of the drum, and they have a limited vertical movement in the slots F' in the side plates of the frame F, within which is fitted the essential portion of the mechanism of my fire-escape.

It is evident from the description of this

part of my invention that the drum may be raised or lowered, having its bearings in the guide plates E, which have a movement in the vertical slots F', and that its tendency would be to drop by gravitation to the lower part of the slots. To avoid this I use the coil-springs *ff*, secured at one end to the upper part of the frame, and with the lower ends attached to the journal of the drum, as shown in Figs. 1 and 3. These springs are made sufficiently stiff to hold the drum with its weight of rope in a normal position and free from contact with the friction-spring below it. This friction spring G is in the form of a half of the well-known elliptic spring, and may be made of any desirable strength and stiffness. Its ends are caught and held between the bent edges of the stiff curved plate G', as shown in Fig. 1.

Now, the operation of the portion of my invention already described is as follows: The frame F being attached in any safe and convenient manner to the window or to any piece of furniture, so that the cord may swing clear of the window-sill, the loose end of the cord is secured around the body of the person, who, passing out of the window backward, has his hands and feet free to keep himself free from any obstructions, and his weight on the rope immediately depresses the drum and brings the casings B in contact with the friction-spring G, and the amount of friction will be automatically adjusted to the weight on the cord, as the friction exerted must be in proportion to the weight suspended, a heavy or a light body descending at the same speed. As the rope in its descent unwinds from the drum, the revolutions of the drum necessarily wind up the watch-springs in the casings B. As these springs have their inner ends attached to the loose collars C, secured in the vertical slot of the frame, it is evident that as soon as the cord is relieved of the weight of the person the drum will be raised from the friction spring by the springs *f*, when the recoil of the watch-springs in the casings B will rewind the cord into position ready again for use. In order to hold the rope as it descends clear of the friction-spring and its casing G', I insert the roller H, journaled in the lower part of the frame F, and pass the cord outside of this and then back behind the roller I, with a view to throwing the weight as

nearly as possible under the center of the drum. It is evident that if a round cord be used it would not lay itself regularly around the face of the drum. To secure a regularity of
 5 feed of the cord as the spring winds it back on the drum, I have arranged the bifurcated arm J, pivoted at *j*, and slotted at its upper end to receive the eccentric pin K on the pinion K', which meshes with the worm-gear L on the
 10 shaft L', which also carries a small cog-wheel, M, intermeshing with the gear-wheel N, attached to the outer side of one of the casings B, as shown in Fig. 1. From this construction it is clear that as the casing B is revolved upon
 15 the return of the rope to the drum the wheel N, intermeshing with M, will revolve the shaft L' and worm L, which in turn must revolve the pinion K', when the pin K will cause the bifurcated arm J to vibrate within the segment
 20 of a circle equal to the width of the face of the drum, and holding, as the arm does, the cord *a* within its bifurcations, (see Fig. 1,) the cord is necessarily fed smoothly on the drum, which is an essential feature when a round cord is
 25 used. When I use a flat tape, the feeder is unnecessary and may be readily detached from the fire-escape.

My invention can be made very light and to occupy very little space in packing. When
 30 one is to be used permanently in a house, the party should arrange to have a short metal bar or arm so attached to the side of a window as to be easily taken out or put back in place as occasion required. To this arm might be

rigidly fixed a safety-hook, over which to pass 35 the ring of the fire-escape when needed for use.

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

1. In a friction fire-escape, the drum A, 40 cord *a*, casings B, and springs *b*, in combination with the springs *f*, and friction-spring G, all constructed to operate substantially as and for the purpose set forth.

2. In a friction fire-escape, the drum A, 45 cord *a*, casing B, and springs *b*, *f*, and G, in combination with the slotted frame F, the loose collar C, washer D, and guide-plate E, all constructed and arranged to operate substantially as and for the purpose herein set forth. 50

3. In a friction fire-escape, a device for feeding the winding-cord regularly to the drum, as herein described, and consisting, essentially, of a bifurcated and pivoted arm, J, the pinion K', carrying the pin K, the worm-gear L on 55 the shaft L', and the toothed wheels M and N, substantially as set forth.

4. In a friction fire-escape, the drum A and casing B, carrying the cog-wheel N, in combination with the cog-wheel M, shaft L', worm-gear L, pinion K', provided with a pin, K, and pivoted arm J, all constructed and arranged 60 substantially as and for the purpose set forth.

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Witnesses:

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