

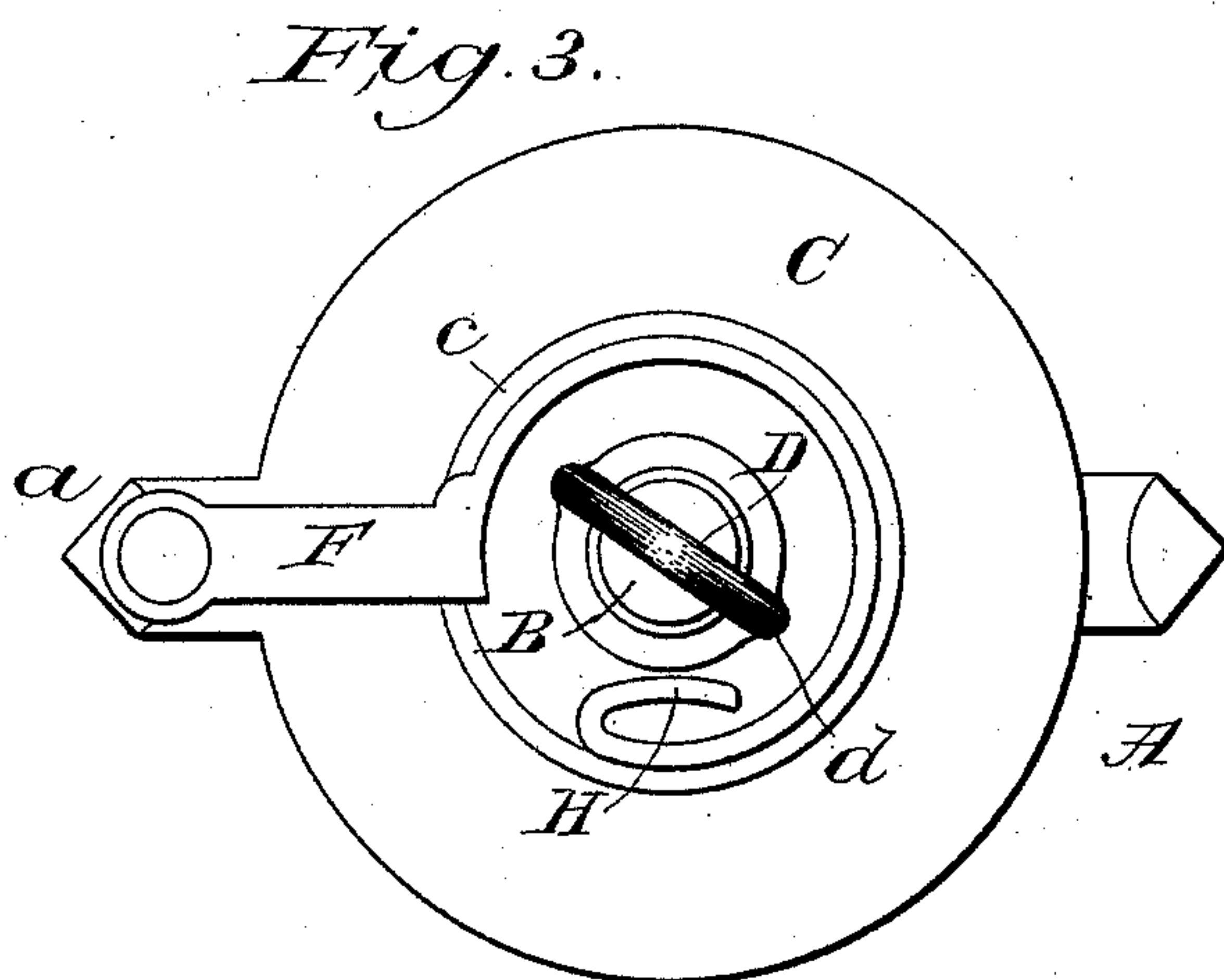
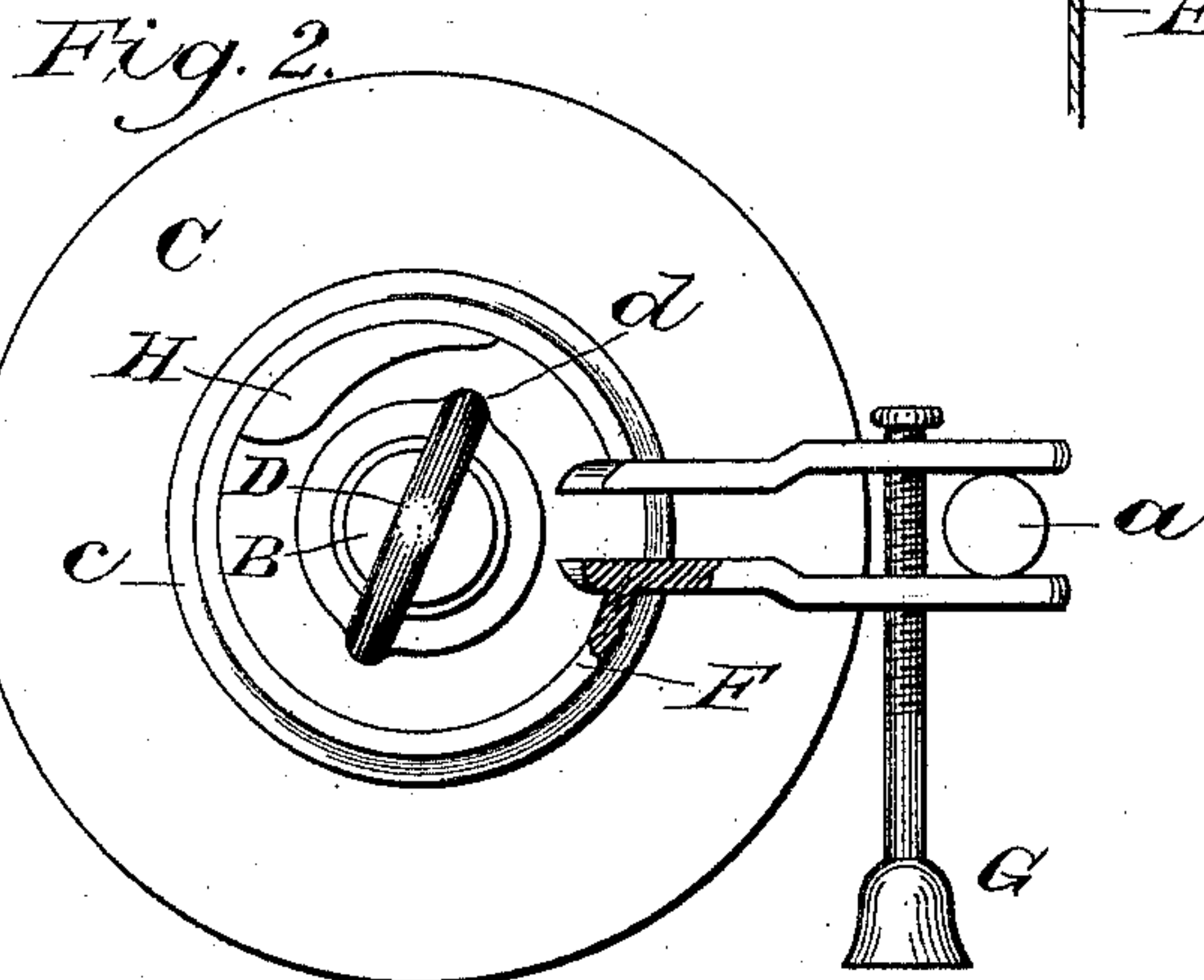
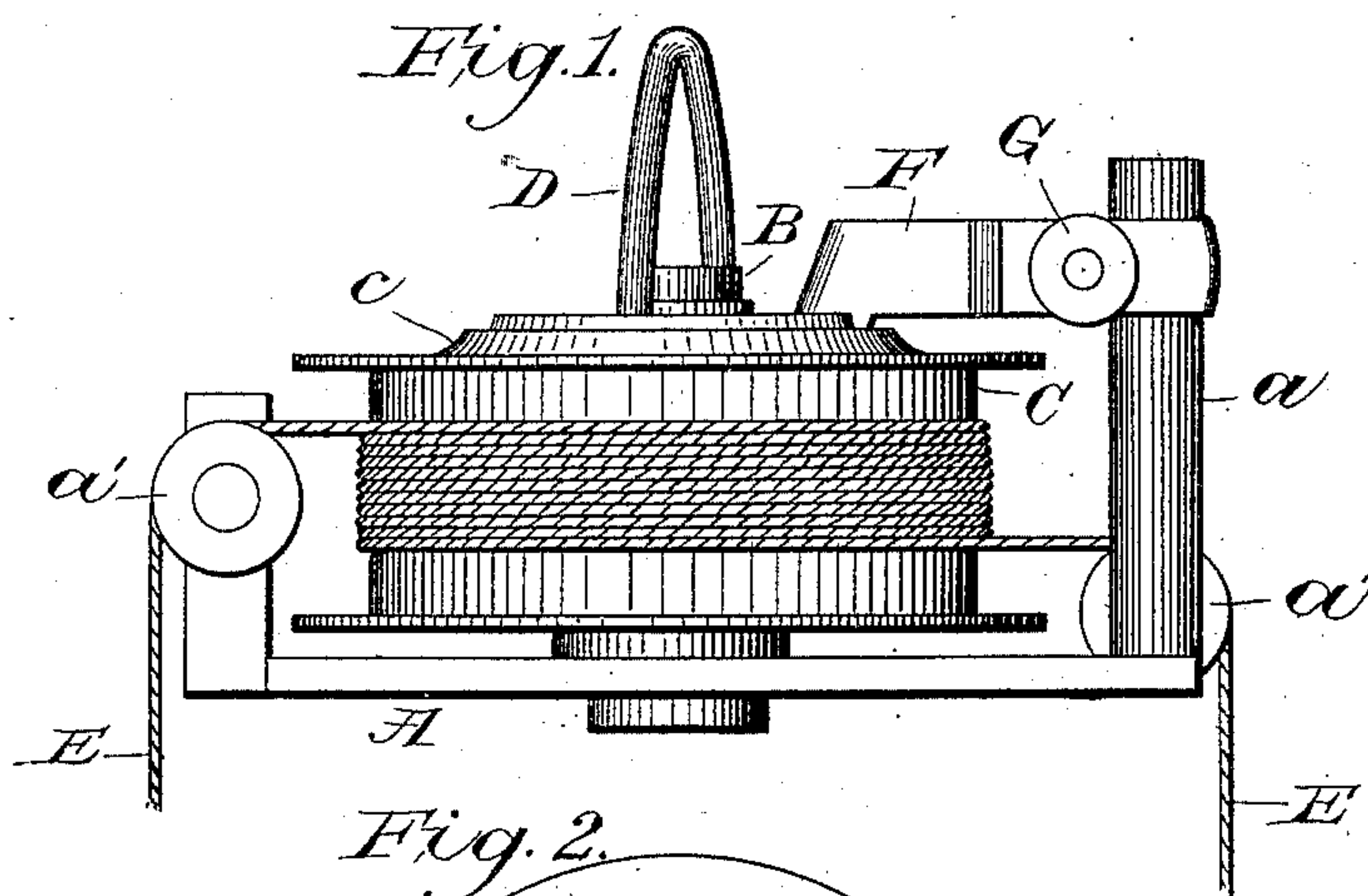
(No Model.)

2 Sheets—Sheet 1.

F. RHIND.
SUSPENSION DEVICE.

No. 421,192.

Patented Feb. 11, 1890.



Witnesses:
Cora B. Hood.
S. J. R. Oby.

Inventor:
Frank Rhind
per Geo. L. Cooper
Atty

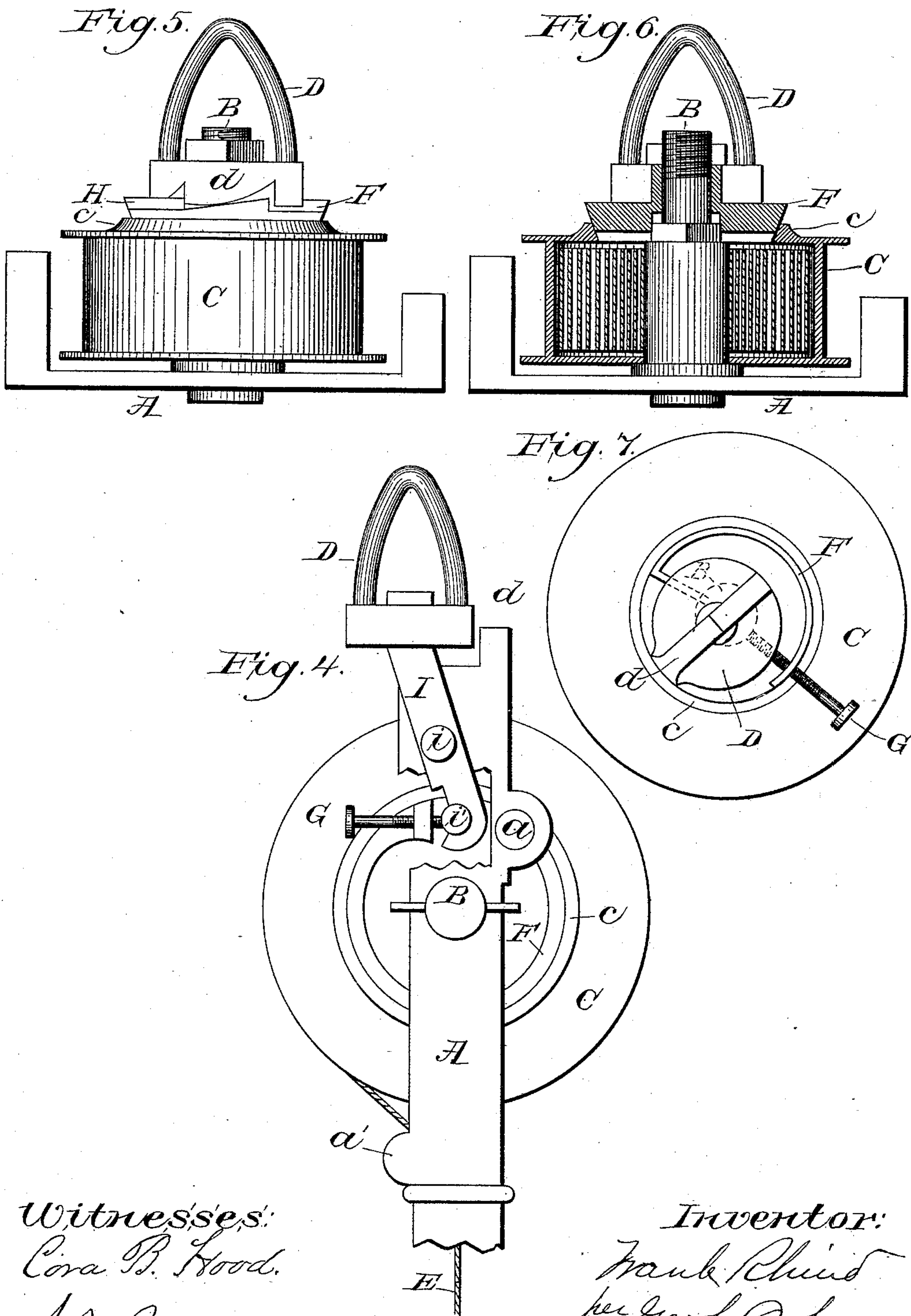
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UNITED STATES PATENT OFFICE.

FRANK RHIND, OF MERIDEN, CONNECTICUT, ASSIGNOR OF ONE-HALF TO
CHARLES S. UPTON, OF NEW YORK, N. Y.

SUSPENSION DEVICE.

SPECIFICATION forming part of Letters Patent No. 421,192, dated February 11, 1890.

Application filed April 20, 1889. Serial No. 308,042. (No model.)

To all whom it may concern:

Be it known that I, FRANK RHIND, a citizen of the United States, residing at Meriden, New Haven county, Connecticut, have invented an Improvement in Suspension Devices, of which the following is a specification.

My invention relates to that class of suspension devices in which a rotary spring-drum is provided with a friction-brake and is intended to combine with the advantage of the brake that of a lock or stop by which the rotation of the drum may be arrested or the friction quickly increased and diminished.

In the accompanying drawings, Figure 1 is an elevation of my device; Fig. 2, a top plan view of the same; Fig. 3, a top plan view of a modification; Fig. 4, an elevation of another modification; Figs. 5 and 6, respectively, an elevation and a vertical section of another modification; and Fig. 7, a top plan view of still another modification.

Similar letters refer to like parts in the several views.

A designates a frame; *a*, a stud on the frame A; *a'*, an idler also on the frame A; B, an arbor; C, a spring-inclosing drum; *c*, a flange on the drum C; D, a loop or hanger; *d*, a lug on the loop D; E, a cord or chain wound on the drum C; F, a brake-shoe or strap; G, an adjusting-screw; H, a lug or wedge; I, Fig. 4, a swing-frame; *i*, a pivot on the frame I, and *i'* a stud also on the frame I.

The example of my invention shown in Figs. 1 and 2 of the drawings is constructed and operated as follows: The frame A and arbor B are integral, the frame being provided with a stud or post *a*, and with suitable bearings for the idlers or guide-pulleys *a'*. The arbor B is vertical and forms an axis for the spring-inclosing drum C, on which the chains E are wound. On the upper end of the arbor B the loop or hanger D is secured so that while the loop is supported by a ceiling-hook so as to be incapable of rotation the arbor B and frame A may have a limited rotation in a horizontal plane. On the upper end of the drum C is the annular flange *c*.

The brake-shoe F consists of a divided annular portion within this annular flange *c*, and of two radially-extending arms, one on each side of stud *a*. These radial arms are

separated by an adjusting-screw G. It will be seen that the brake-shoe F is held from rotation with the drum by the stud or post *a*, and that the amount of friction between the divided annular portion and the flange *c* may be increased or diminished by the adjusting-screw G, so that the whole forms an efficient adjustable friction device.

On the inner side of the annular portion of the brake-shoe F is secured a wedge-shaped lug H. When the frame A is rotated, the lug *d* on the loop D engages with this wedge or lug H, thereby causing sufficient friction between the brake-shoe F and the flange *c* to prevent the rotation of the drum C. The rotation of the frame A may be communicated to it through the chains E E from the lamp-supporting portion below, as fully described in reissued Letters Patent No. 10,967, dated November 20, 1888. It will be seen that a weight, as a lamp depending from the lower ends of the chains E E, may be pulled down by the operator in opposition to the force of a convolute spring inclosed within the drum C, and that when the weight is raised the reaction of this spring will rewind the chains E E on the drum C. The effect of the friction between the brake-shoe F and the concentric flange *c* is to maintain the suspended weight at any desired elevation, notwithstanding considerable variations in the weight of the suspended article and of the force of the spring. When it is desired to lock the drum against rotation, a partial rotation given to the lamp or other suspended article will be communicated through the chains E E to the frame A, causing the lug *d* on the loop D to press against the wedge or lug H, secured to the shoe F, thereby quickly and greatly increasing the friction between the shoe and the flange *c*.

The form of construction shown in Fig. 3 of the drawings differs from that described chiefly in that the brake-shoe or strap H is in this case rigidly secured at one end to the stud or post *a*, its other end being free. The wedge H is here shown as an integral extension of the brake-band F bent back on itself. The action of the brake and of the locking device in this construction will be essentially as before described. It will be seen that in

this device the brake-shoe F, if made of resilient metal, being rigidly connected to the frame A at one end and free at the other end, will produce greater friction when the drum C is rotated in one direction than when this rotation is in the reverse direction. This feature, however, I expressly disclaim, as it forms no part of my invention.

In Fig. 4 of the drawings the frame A is shown as vertically suspended, with the separate arbor B arranged horizontally, so that the plane of rotation of the drum C is a vertical one. In this case the radially-projecting portion of the brake-shoe F is dispensed with, one end of the divided annulus being directly secured to the frame A. The swing-frame I is pivoted to the frame A at *i*, so that the frame A is capable of limited vertical rotation with reference to the swing-frame I. The stud *i'* bears against the end of the screw G in the free end of the annular brake-shoe F, so as to produce frictional contact between the shoe F and the flange *c*. The amount of pressure exerted by the stud *i'* upon the free end of the shoe F may be regulated by the adjusting-screw G. The loop or hanger D is pivotally secured to the swing-frame I, so that the weight of the frame and of the suspended article tends to increase the pressure of the stud *i'* on the end of the shoe F on the flange *c*. The swing-frame I, with the frame A and all that it carries, is capable of limited rotation in a horizontal plane on the loop D. This rotation may be communicated, as before, from the article suspended through the cord or chain E, or in any other desired manner. In the drawings I have shown the device as applied to an extension-chandelier, in which case the rotation may be communicated through the tube through which the chain E passes. When this horizontal rotation on the loop D is produced, the lug *d* on the loop D strikes against the upper end of the frame A, so as to tilt the frame A in the swing-frame I, thereby lessening the pressure of the stud *i'* on the free end of the brake-shoe F and permitting the rotation of the drum C in either direction. It will be seen that this form of construction differs from either of the former in being normally locked, so that it is necessary for the operator to partly rotate the frames on the loop D before the lamp or other suspended article can be either raised or lowered.

In Figs. 5 and 6 of the drawings the brake F is shown as an inverted-cone frustum bearing against a correspondingly-tapered annular flange *c* on the upper surface of the drum C. The brake F is fixed against rotation with the drum, and the amount of friction exerted by the brake F on the flange *c* may be regulated by a nut working on the screw-threaded upper end of the arbor B. The upper surface of the brake F is divided into a series of inclined planes or wedges, and the lower surface of the hanger D is provided with corre-

spondingly-inclined planes, both as shown in Fig. 5, so that a partial rotation of the frame A and brake F relative to the hanger D causes the inclined planes on the hanger D to ride upon those on the brake F with the effect of preventing further rotation of the drum C on the frame A.

In Fig. 7 I have shown the upper surface of a drum C provided with an annular flange *c*. Within the flange *c* is the brake band or sleeve F, in the form of an arc of a circle, secured at one end by means of a radial arm to the arbor B and provided at its other end with an adjusting-screw G, by means of which the amount of friction between the brake F and the flange *c* may be varied.

Upon the upper end of the arbor B is an eccentric cylindric portion, on which the loop D is mounted. The loop D is provided at its base with a projecting lug *d*, within the flange *c*, adapted to bear against the free portion of the flange *c* between the ends of the band F. The loop D being eccentrically mounted on the axis of rotation of the frame A, it is plain that a partial rotation of the frame A and arbor B relative to the loop D will cause the lug *d* to bear against the flange *c* of the drum C, thereby preventing the rotation of the drum C on the frame A.

I have described several modes of embodying my invention, and am satisfied that it may be embodied in other different forms of construction. I do not wish, therefore, to be understood as limiting myself to any particular form or application of a brake shoe or band, it being only essential to my invention that the spring-inclosing drum be provided with a frictional bearing-surface; that there be secured to the frame a brake stationary with reference to said drum, and that the frame be capable of partial rotation on the loop or hanger, so that by means of said partial rotation the friction on said bearing-surface may be quickly increased or diminished, thereby preventing or permitting the rotation of the drum and the elevation or depression of the suspended article. My present invention may be considered as an improvement on the device patented to me November 20, 1888, Reissue No. 10,967.

I am aware of the existence of various Letters Patent covering different forms of brake shoes or bands adapted to secure either constant or adjustable frictional contact with a spring-inclosing drum; but I am not advised that in any former construction such brake-shoe and a locking device have been combined as here described.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is as follows:

1. In a suspension device, the combination of a stationary suspending part, an adjustable part consisting of a frame, a rotary spring-drum in said frame, and a brake in frictional contact with said drum, and a locking device

one portion of which is connected with said stationary part, the other portion connected with said brake, substantially as described.

2. In a suspension device, the combination
5 of a stationary suspending part, an adjustable part consisting of a frame, a rotary spring-drum in said frame, and a brake in frictional contact with said drum, and a locking device
10 one portion of which is connected with said stationary part, the other portion connected with said brake, said locking device being operated by the rotation of the adjustable part, substantially as described.

3. In a suspension device, the combination
15 of a stationary suspending loop or hanger, a frame supported by said hanger so as to be capable of partial rotation in a horizontal plane, a rotary spring-drum supported on an axis in said frame, a brake connected with
20 said frame and in frictional contact with said drum, a cord or chain on said drum and passing downward to the article suspended, and a locking device one portion of which is connected with said loop or hanger, the other
25 portion connected with said brake, said locking device being operated by the rotation of the adjustable part of the fixture communicated from the article suspended, substantially as described.

30 4. In a suspension device, the combination of a stationary suspending loop or hanger, a

frame supported by said hanger so as to be capable of partial rotation in a horizontal plane, a rotary spring-drum supported on an axis in said frame, a brake connected with said
35 frame and in frictional contact with said drum, two or more cords or chains on said drum and passing downward to the article suspended, and a locking device one portion of which is connected with said loop or hanger, the other
40 portion connected with said brake, said locking device being operated by the rotation of the adjustable part of the device communicated from the article suspended through the two or more cords or chains, substantially as
45 described.

5. In a suspension device, the combination of a stationary suspending-loop, a frame supported by said loop so as to be capable of partial rotation in a horizontal plane, a stud
50 or post on said frame, an arbor in said frame, a rotary spring-drum mounted on said arbor, an annular flange on said drum, a friction-brake acting in conjunction with said flange, and a wedge-shaped lug on said brake adapted
55 to engage with a lug on said suspending-loop in consequence of the rotation of said frame on said loop, substantially as described.

FRANK RHIND.

Witnesses:

GEO. L. COOPER,

E. B. HAWLEY.