

Apr. 17, 1923.

1,452,070

C. F. DAVY

LOWERING DEVICE

Filed Nov. 29, 1918

3 Sheets-Sheet 1

Fig. 1.

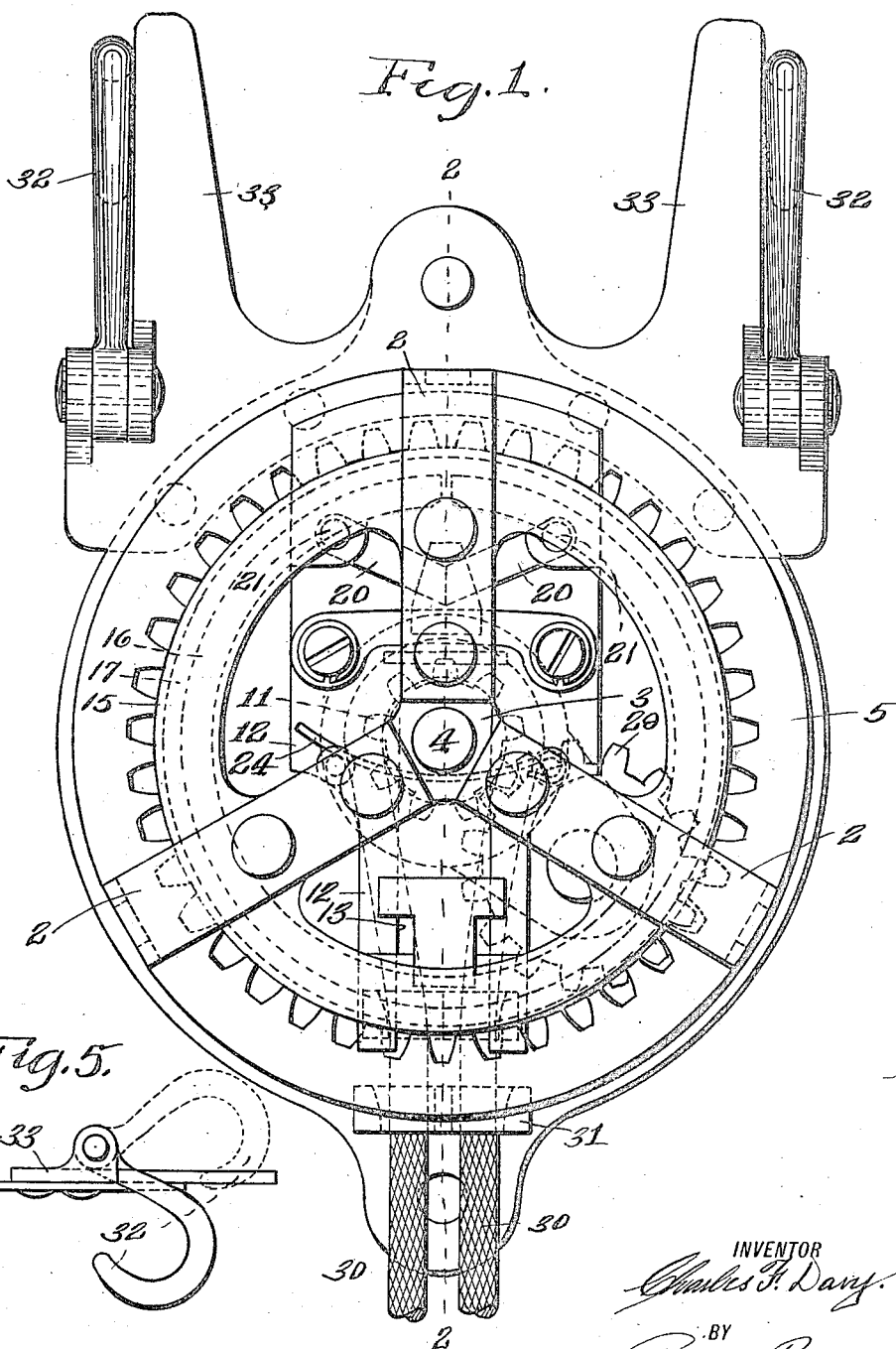


Fig. 5.

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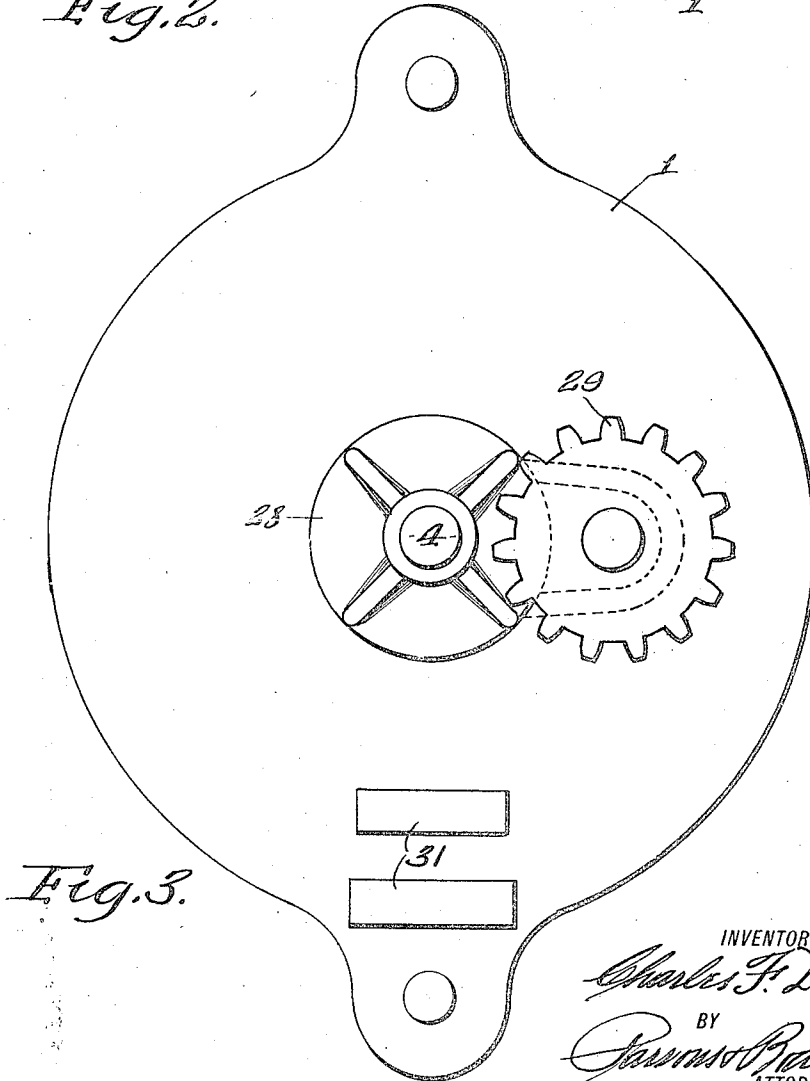
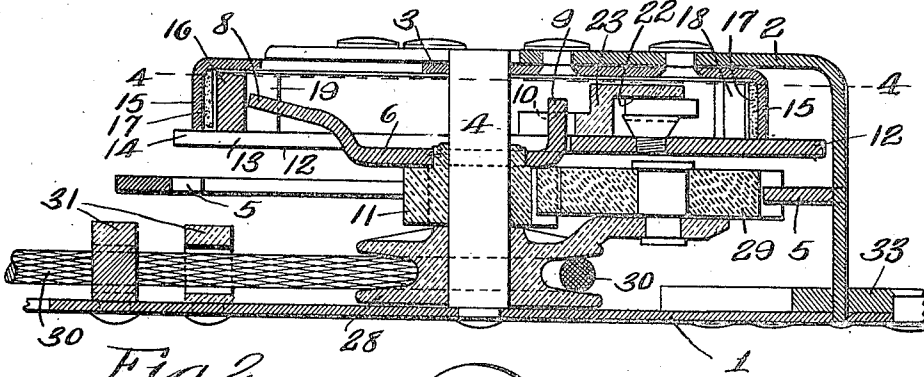
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3 Sheets-Sheet 2



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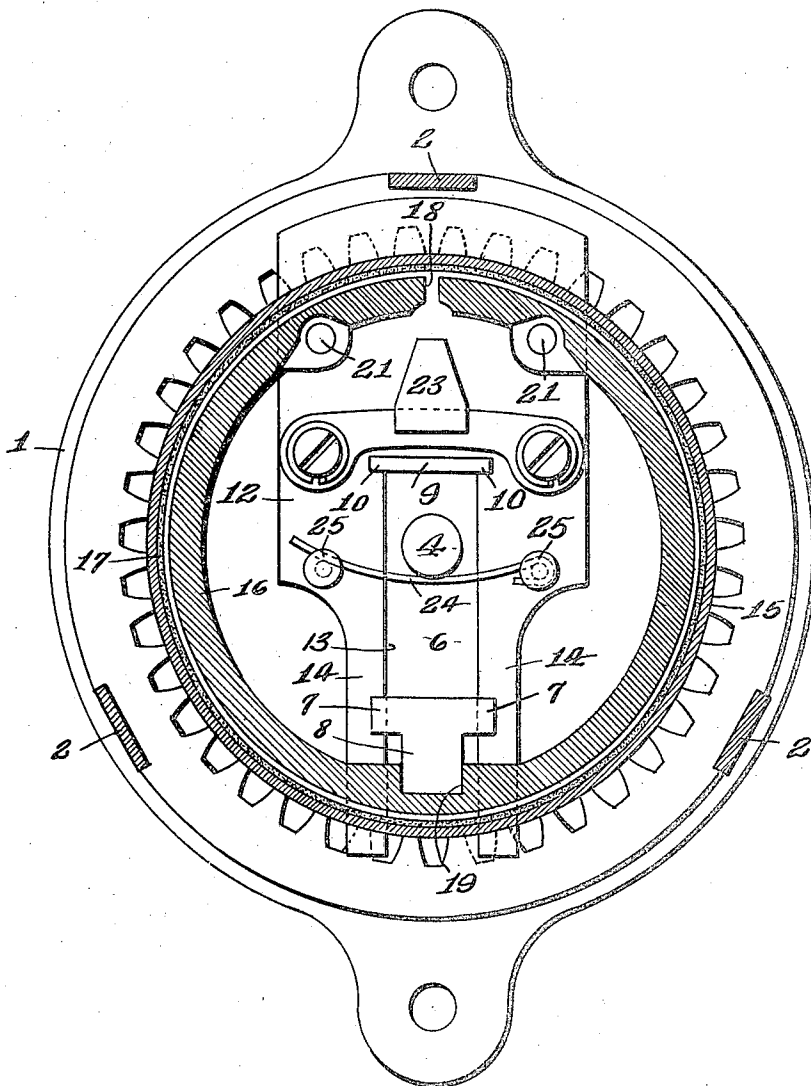
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3 Sheets-Sheet 3

Fig. 4.



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## UNITED STATES PATENT OFFICE.

CHARLES F. DAVY, OF SYRACUSE, NEW YORK.

## LOWERING DEVICE.

Application filed November 29, 1918. Serial No. 264,697.

*To all whom it may concern:*

Be it known that I, CHARLES F. DAVY, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Lowering Device, of which the following is a specification.

This invention relates to self controlled lowering devices as fire escapes having centrifugal brake means, and has for its object a particularly simple and efficient means by which the speed at which the article is lowered, is automatically controlled. The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a plan view of my lowering device.

Figure 2 is a sectional view on line 2—2, Fig. 1.

Figure 3 is a face view of the base plate, the pulley and planetary pinion being also shown.

Figure 4 is a sectional view, parts being omitted on line 4—4, Fig. 2.

Figure 5 is a detail view of the means for attaching the base plate to a wall or other support.

This lowering device is an improvement on the types of lowering devices as fire escapes shown in my Patents Nos. 818,526, April 24, 1906; 1,066,716, July 8, 1913, and one of the objects is a particularly simple and efficient arrangement of spring associated with a centrifugal member for resisting the throw of said member and another object is the relative arrangement of the leverage of the cable on the rotatable parts whereby dependence on brake surfaces to control the speed of lowering is reduced to a minimum.

The frame includes a base plate 1 and an upper portion comprising spider arms 2 mounted on the base plate and extending outwardly away from the base plate and then inwardly and radially toward the center of the base plate and formed with a bearing 3 for the shaft or stud 4 extending from the base plate 1.

5 is the internal annular rack carried by the spider arms 2.

6 is a carrier rotatable about the shaft

1, the carrier including a body formed with guides or notches 7 near its outer end portion 8, said outer end portion 8 being deflected outwardly out of the plane of the body. The portion 9 of the carrier on the opposite side of the shaft 4 to that on which the portion 8 is located, is turned at an angle to the major part of the body and formed with shoulders 10 overhanging the centrifugal member to be presently described.

11 is the gear rotatable with the carrier 6 about the shaft 4 and as here shown the carrier 6 is mounted on the hub of the gear 11.

12 is the centrifugal member which is in the form of a plate arranged astride the shaft 4, and having a slot 13 through which the shaft 4 extends, the portions or arms 14 on opposite sides of the slots extending through the guides or notches 7 and under the shoulders 10 of the carrier, and also under the stationary brake band 15 carried by the spider arms 2. The portion 80 of the centrifugal member opposite to that provided with the arms 14 also extends under the stationary brake band 15. This portion is comparatively light weight.

The brake means in addition to the stationary band 15 comprises an expanding ring or shoe 16 located within the brake band 15 and connected to the carrier 6 to be rotated thereby and also to the centrifugal member 12 by expanding means operated by the outward throw of the centrifugal member during the rotation of the carrier 6. A friction band or lining 17 of suitable material is located between the band 15 and the shoe 16.

The lining 17 relieves the band 15 and ring or shoe 16 of wear and makes the use of oil unnecessary, and causes the machine to remain in the same operative condition after being idle for long periods as when in constant use. The lining 17 may be fixed to either the band 15 or shoe 16 or unattached to either of said parts 15, 16.

As here shown, the shoe 16 is in the form of an expansible band split at 18 and in the side thereof diametrically opposite the split 18 thereof is formed with means as a notch 19 for coupling the outer end 8 of the carrier to the shoe 16. The means connecting the centrifugal member 12 and the shoe 16 to expand the same comprises arms 20 pivoted at 21 thereto on opposite sides of the

split 18 and abutting against each other at their ends, these arms converging inwardly toward their meeting ends and being located in a socket 22 formed on a bracket 23 secured to the centrifugal member 12.

The outward throw of the centrifugal member, which as before stated is comparatively light, is resisted by a spring 24 and as here shown, this spring is a bow spring consisting of a single resilient piece bearing at its opposite ends on posts 25 on the centrifugal member on opposite sides of the shaft 4 and having its intermediate portion arranged to engage a fixed abutment as the shaft as the centrifugal member throws outwardly. The spring is secured to one post 25 by being coiled about the same and its other end merely bears against the other post. Hence, the spring after being secured to one post can be readily placed in position after the parts of the device have been assembled.

28 is a pulley or sheave mounted on the shaft 4 contiguous to the base plate 1 and beneath the gear 11.

29 is a planetary pinion carried by the sheave and meshing with the gear 11 and the internal annular rack 5.

30 is a cable the opposite runs of which extend through guides 31 provided on the base plate 1, the cable passing over the pulley.

The pulley 28 is of less diameter than the distance between the axes of the shaft 4 and the pinion 29 so that the cable in running over the sheave or pulley passes near the axis of the shaft 4 and applies but a small leverage on the pulley and causes the carrier to be rapidly rotated so that a centrifugal member of comparatively light weight and a light spring can be used. Hence, the device is adapted to lower minimum weights as well as maximum.

The device may be attached to a support by any suitable means as hooks 32 pivoted to a bracket 33 fixed to the base plate 1.

In operation, the bracket 33 is fixed to a suitable support and when it is necessary to use the device as when it is used as a fire escape, the user throws the long run of the cable 30 out of the window and attaches the short run of the cable around his body by a belt or other suitable means and drops out of the window. Thereupon, the weight of the user on the short run of the cable causes the pulley 28 to rotate, revolving the planetary pinion 29 in its orbit, which also rotates about its own axis owing to the fact that it is in mesh with the internal rack 5. The movement of the pinion 29 rotates the gear 11 on the shaft 4, which in turn operates the centrifugal brake mechanism so that when the speed of the gear 11 reaches a pre-

determined amount the brake shoes 16 are caused to frictionally engage the brake lining 17 and the lining 17 to engage the brake band 15 and thus regulate the speed at which the user drops to the ground. Owing to the fact that the pulley 28 over which the cable runs is of smaller radius than the orbit of the planetary pinion 29, minimum reliance is placed upon brake surfaces.

What I claim is:

1. A lowering device comprising a frame, a shaft carried by the frame, a carrier rotatable about the shaft, a centrifugal member rotatable with said carrier and arranged astride the shaft, a spring connected at its opposite ends to said member on opposite sides of the shaft and having its intermediate portion arranged to engage the shaft during the outward throw of the centrifugal member, and brake means operated by rotation of the carrier element and the throw of the centrifugal member, substantially as and for the purpose specified.

2. A lowering device comprising a frame, a shaft carried by the frame, a carrier rotatable about the shaft, a centrifugal member rotatable with the carrier and arranged astride the shaft, brake means operated by the rotation of the carrier and the action of the centrifugal member, a gear mounted on the shaft and rotatable with the carrier, a pulley mounted on the shaft, a planetary pinion carried by the pulley, a stationary internal annular rack carried by the frame and meshing with the planetary pinion, the pulley being of less diameter than the distance between the axes of the shaft and the planetary pinion whereby the cable runs over the pulley near the axis of the shaft, and a bow spring for resisting the outthrow of the centrifugal member, the spring being fixed at its ends to the centrifugal member on opposite sides of the shaft and having its intermediate portion located to engage the shaft during outthrow of said member, substantially as and for the purpose described.

3. A lowering device comprising a frame, a carrier rotatable in the frame, a centrifugal member rotatable with the carrier, a spring connected at its opposite ends to said member on opposite sides of the axis of the carrier and having its intermediate portion engaging an abutment fixed relatively to the carrier and brake means operated by the rotation of the carrier and the throw of the centrifugal member, substantially as and for the purpose set forth.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and State of New York, this 18 day of November, 1918.

CHARLES F. DAVY.