

No. 622,059.

Patented Mar. 28, 1899.

J. O. MILLER.
FIRE ESCAPE.

(Application filed Aug. 20, 1898.)

(No Model.)

2 Sheets—Sheet 1.

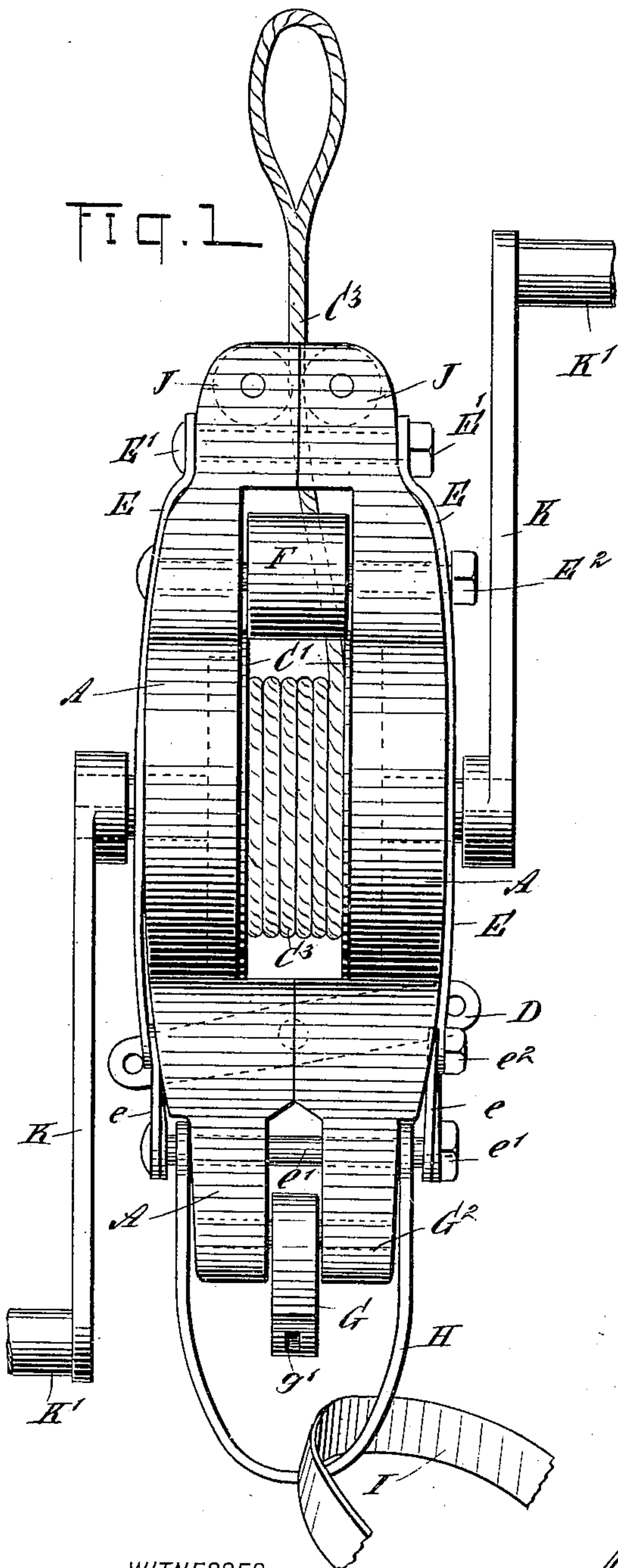
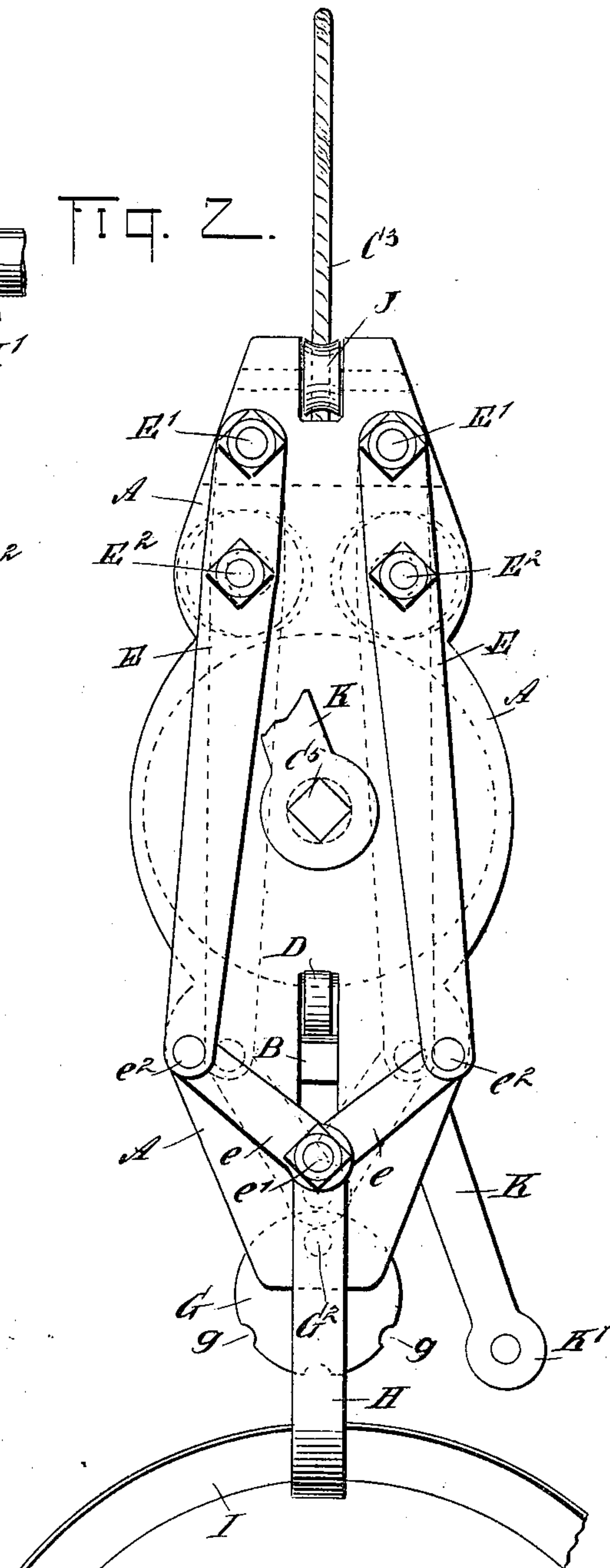


FIG. 2.



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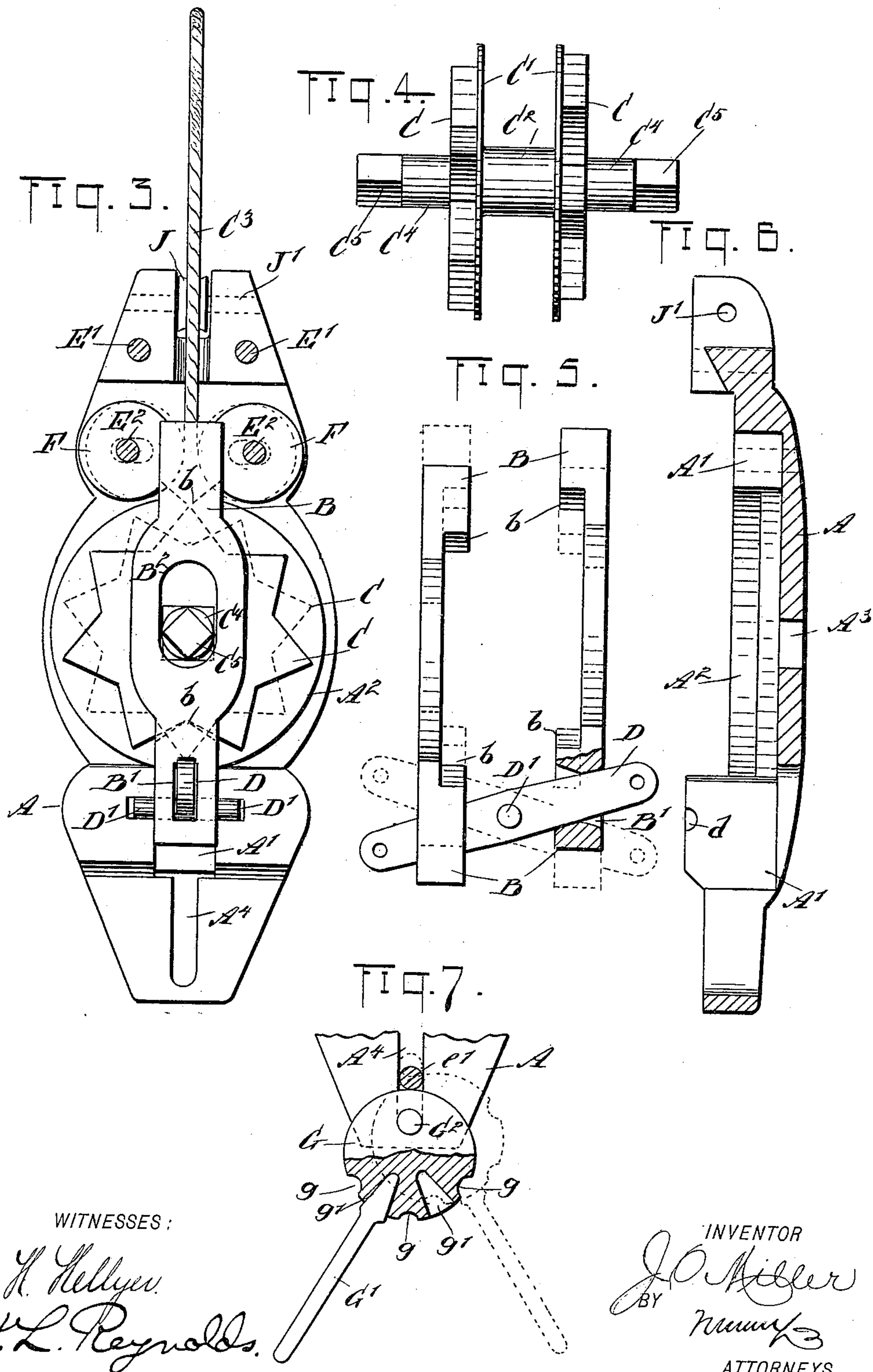
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JAMES OMAR MILLER, OF COOLGARDIE, WEST AUSTRALIA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 622,059, dated March 28, 1899.

Application filed August 20, 1898. Serial No. 689,166. (No model.)

To all whom it may concern:

Be it known that I, JAMES OMAR MILLER, of Coolgardie, West Australia, have invented a new and Improved Fire-Escape, of which the following is a full, clear, and exact description.

My invention relates to an improvement in fire-escapes of that class which are portable; and it consists, essentially, of a cord-carrying drum mounted within a casing and having toothed wheels connected to the drum and reciprocating bars having projecting points engaging the teeth of said wheels, thus providing an escapement mechanism which will prevent a too-rapid rotation of the drum under the weight of the user.

It further consists in bars pivoted at one end and carrying friction devices adapted to engage the cord and at the other end having links connecting opposite bars, to which links is connected the weight-supporting mechanism in such a manner as to clamp the friction devices upon the cord, and also of a cam mechanism by which the pressure of said friction devices may be released at will.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an edge elevation of my device. Fig. 2 is a side or face elevation. Fig. 3 is a side view of my device with one-half of the casing removed. Fig. 4 is a side view of the drum and the toothed wheels connected thereto. Fig. 5 is a detail showing the reciprocating bars which engage the teeth upon the wheels. Fig. 6 is a longitudinal section taken through one-half of the casing, and Fig. 7 is a detail showing the construction of the cam by which the cord-clamping mechanism is released.

My device is intended to be used more particularly for a fire-escape, but, as will be hereinafter pointed out, is capable of use for other purposes. It comprises a drum upon which the cord is wound, and this drum consists of the central barrel C^2 and the flanges C' , between which the cord C^3 is wound. Upon the outside of these flanges are fixed the toothed wheels C . These wheels should have an odd number of teeth, so that the point of one tooth is diametrically opposite the space be-

tween two other teeth. Moreover, the two wheels should be arranged so that their teeth alternate with each other, as shown by the solid and dotted lines in Fig. 3. The shaft of the drum extends outward and is provided with journals C^4 , fitting within apertures in the casing A . The outer ends of the shaft are provided with squared ends C^5 or are arranged in any other manner, so that a crank may be placed upon either end. The casing A is hollowed out so as to receive the drum with the toothed wheels C and also the reciprocating bars B , which latter are shown in edge view in Fig. 5 and in side view in Fig. 3. At the center the bars are provided with slots B^2 , adapted to embrace the shaft of the drum, and at each end they are provided with a side projecting point or tooth b , adapted to engage the teeth upon the wheels C . At one end said bars are also provided with openings B' , adapted to receive the lever D , which has a central pivot-pin D' fitting within recesses d in the casing. The outer ends of the lever may project through the casing, as shown in Fig. 1, and be provided with apertures adapted to receive a cord when desired. By means of this connection and also the arrangement of the teeth upon the two wheels C the motion of the bars B is alternate—that is, while one is moving in one direction the other is moving in the opposite direction.

The casing A is provided with recesses A' , adapted to receive the ends of the bars B and compel them to move in a straight line, the edges of the bars B closely fitting the recesses A' . The casing is also preferably provided with recesses A^2 , which embrace and entirely cover the toothed wheels C . The recesses may, if desired, be continued so as to also cover the drum.

Mounted in the upper end of the casing are the guide-rollers J , between which the cord C^3 passes as it leaves the casing. Near the upper end of the casing are pivot-bolts E' , to which are pivoted the levers E , said levers extending longitudinally of the casing and carrying near their pivot ends pivot-bolts E^2 , upon which are mounted to rotate friction-rollers F .

The casing A is provided with apertures, which receive the bolts E^2 and permit them to have a slight lateral motion. To the lower

ends of the levers E are pivoted at e^2 links e , which have their outer ends connected to each other, thus forming a toggle-joint. The bolt e' , forming the central pivot for the toggle-joint, passes through a slot A^4 in the casing and also forms a pivot for the stirrup H, to which a belt I or other suitable means is attached by which the user may suspend his weight from the fire-escape.

It is obvious that when a weight is suspended from the stirrup H the links e , forming the toggle-joint connection between the levers E, will be pulled down at their inner ends, thus drawing the levers E toward each other and firmly clamping the suspending-cord C^3 between the friction-rollers F. This will result in checking or entirely stopping the descent of the body held in the belt I, depending upon the adjustment of the parts. If it is desired to release the friction on the cord C^3 , so that the descent will be more rapid, this may be accomplished by means of the cam G, which has a pivot or axis G^2 journaled in the lower end of the casing, the pivot being arranged near one edge of the cam, which, as shown in the drawings, is simply an eccentric. This eccentric or cam is provided with recesses g' , adapted to receive a pin G' , by means of which the cam or eccentric may be rotated.

As shown in Fig. 7, the bolt e' , from which the stirrup H is suspended, is located directly above the cam or eccentric. By rotating the cam in the manner shown by dotted lines in Fig. 7 the bolt e' will be raised, thus raising the links e and forcing the levers E farther apart. This operation releases the hold of the friction-rollers F upon the suspending-cord C^3 . The outer surface of the cam or eccentric G is provided with transverse notches g , adapted when the cam is sufficiently rotated to engage the bolt e' , and in such case the cam will be held by the engagement of the pin e' with the transverse notch g and the backward rotation of the cam be prevented.

The descent of the body held in the belt I will be regulated to a great degree by the operation of the escapement devices hereinbefore described, consisting of the toothed wheels C and the reciprocating bars B, which will act like any escapement to limit the speed of rotation of the drum. This speed of rotation is further regulated through the action of the friction devices described and the cam G. The parts may be so proportioned that when the weight is suspended entirely from the toggle-joint connections, consisting of the links e , the friction devices will clamp the suspending-cord with sufficient force to check the descent of the body, and in this case the cam G may be operated so as to make the descent as slow or rapid as desired. Preferably, however, the parts should be so proportioned that there will be a slow descent even when the cam G is not in use.

My device is also preferably provided with crank-arms K, having at their outer ends handles K' , adapted to be engaged by the hands

of the user, and by means of these arms the speed of descent may also be regulated, if desired. By using the arms the device may also be used as a hoisting apparatus. The ratchet mechanism which regulates the speed of descent is such that it will create but small friction when slowly operated.

The friction clamping devices, consisting of the rollers F and the levers by which they are controlled, may be thrown entirely out of operation by properly placing the cam G, and in this event by rotating the crank-arms K the user may hoist himself. The crank-arms K may be arranged so as to be easily removed, if desired.

This device may thus be used for descending from any height, whether as a fire-escape or as a matter of convenience, as in mining-shafts, wells, &c., and also for carpenters, painters, and other workmen who have occasion to ascend and descend to and from considerable elevations.

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

1. A fire-escape, comprising pivoted levers friction devices carried thereby a suspending-cord passing between the friction devices, a toggle-joint connection at the lower ends of said levers, a weight-suspending connection at the center of said toggle-joint, and means for raising the center of said toggle-joint at will, substantially as described.

2. A fire-escape, comprising pivoted levers, friction-rollers carried thereby and embracing the weight-supporting cord, levers pivoted as a toggle-joint to the said pivoted levers and to each other, a weight-suspending device connected to the central pivot of the toggle-joint, and means for raising said central pivot at will, substantially as described.

3. A fire-escape, comprising pivoted levers friction devices carried thereby a suspending-cord engaged by the friction devices, a toggle-joint connection at the lower ends of said levers, a weight-suspending connection at the center pivot of said toggle-joint, and a cam pivoted beneath the central pivot of said toggle-joint by which said joint may be raised to separate the levers and their friction devices, substantially as described.

4. A fire-escape, comprising pivoted levers friction devices carried thereby, a suspending-cord passing between the friction devices, a toggle-joint connection at the lower ends of said levers, a weight-suspending connection at the center of said toggle-joint, a cam pivoted beneath the central pivot for said toggle-joint and having notches adapted to engage and lock with said pivot, and means by which said cam may be turned by hand, substantially as described.

5. A fire-escape, comprising a casing, a cord-carrying drum pivoted therein, levers pivoted to the casing, friction devices carried by said levers and engaging the suspending-cord, weight-suspending connections to said levers

acting to clamp the friction devices, and means for loosening the friction devices at will, substantially as described.

6. A fire-escape, comprising a casing, a cord-carrying drum pivoted therein, a toothed wheel attached to the drum, an escapement engaging therewith, levers pivoted to the casing, friction devices carried by said levers, an engaging suspending-cord, weight-sus-
 10 pending connections to said levers acting to clamp the friction devices, and means for loosening the friction devices at will, substantially as described.

7. A fire-escape, comprising a casing, a cord-carrying drum pivoted therein, levers pivoted to the casing, friction devices carried by said levers and engaging the suspending-cord, weight-suspending connections to said levers, acting to clamp the friction devices, a cam
 20 adapted to engage the weight-suspending connections to relieve the friction devices, and means for operating the cam at will, substantially as described.

8. A fire-escape, comprising a casing, a cord-carrying drum pivoted therein, two levers pivoted on each side of the casing, friction-rollers carried by said levers between which the cord passes, links pivoted to the lower ends of said levers and to each other, a weight-sus-

pending yoke or stirrup pivoted to the central pivot of said links, a cam pivoted in the casing and adapted to engage said central pivot, and means for rotating said cam at will to raise said pivot, substantially as described.

9. A fire-escape, comprising a casing, a cord-carrying drum pivoted therein, a toothed wheel attached to each side of said drum, escapements comprising longitudinally-movable bars having projections engaging opposite sides of said pivot-wheels, a pivoted lever engaging said bars to insure their alternate action, and means for locking the drum, when desired, substantially as described.

10. A fire-escape, comprising a casing, a cord-carrying drum pivoted therein, a toothed wheel attached to each side of said drum, escapements comprising longitudinally-movable bars having projections engaging opposite sides of said pivot-wheels, a pivoted lever engaging said bars to insure their alternate action, and a crank attached to the drum-shaft by which the cord may be wound in, substantially as described.

JAMES OMAR MILLER.

Witnesses:

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 LEN A. HORSFALL.