

No. 636,480.

Patented Nov. 7, 1899.

W. O. ABBOTT.

FIRE ESCAPE.

(Application filed June 9, 1899.)

(No Model.)

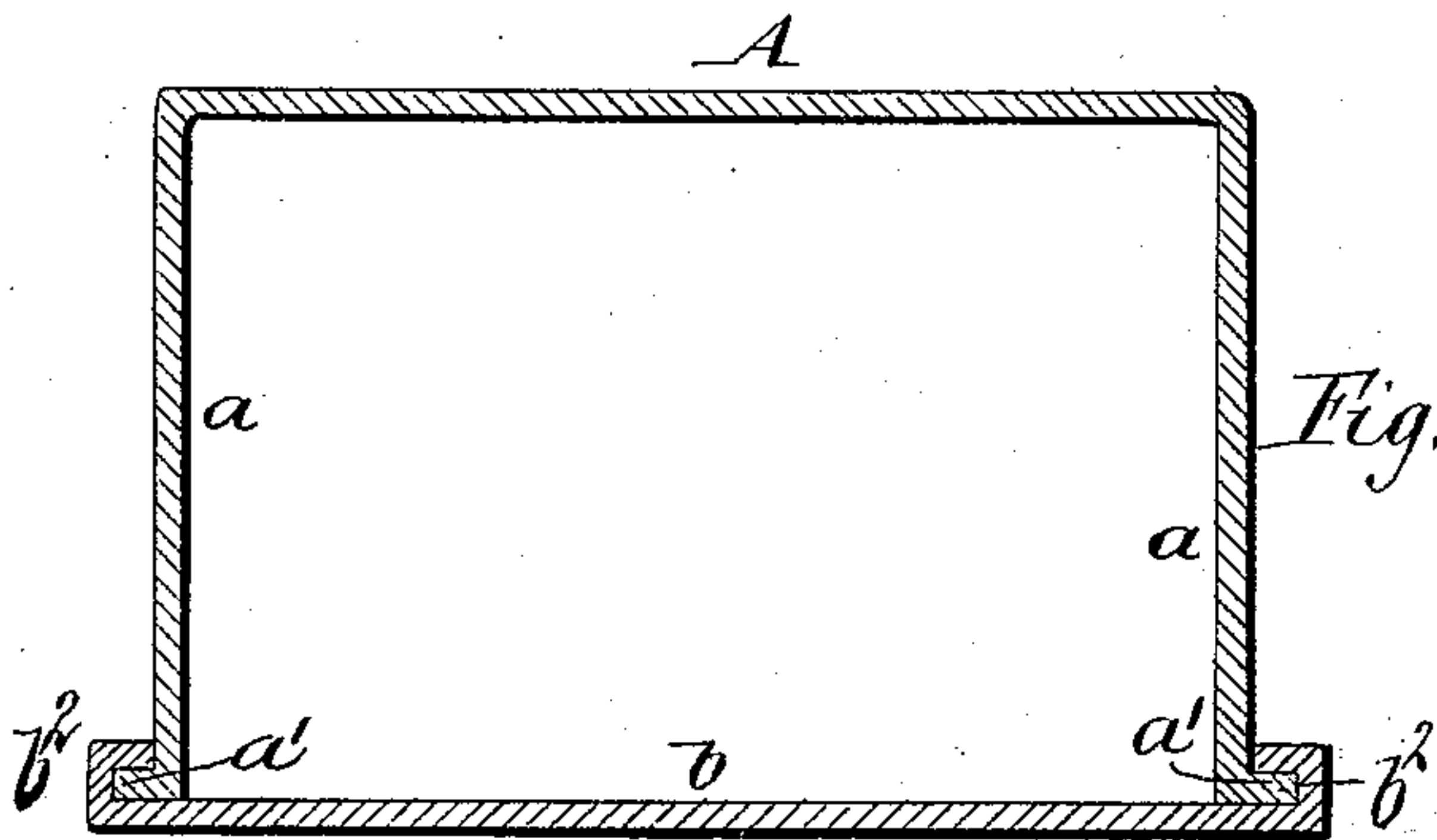


Fig. 5.

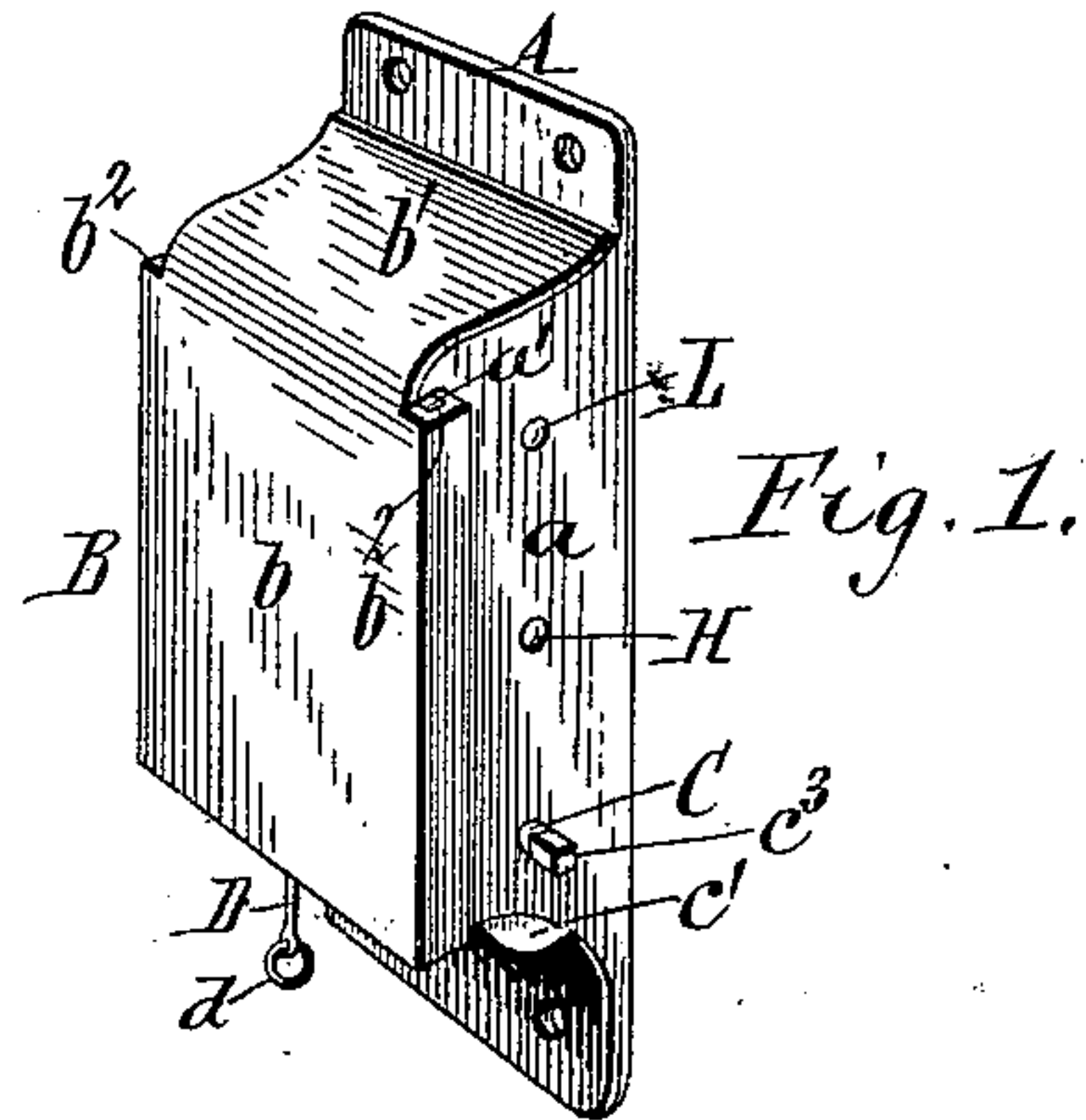


Fig. 2.

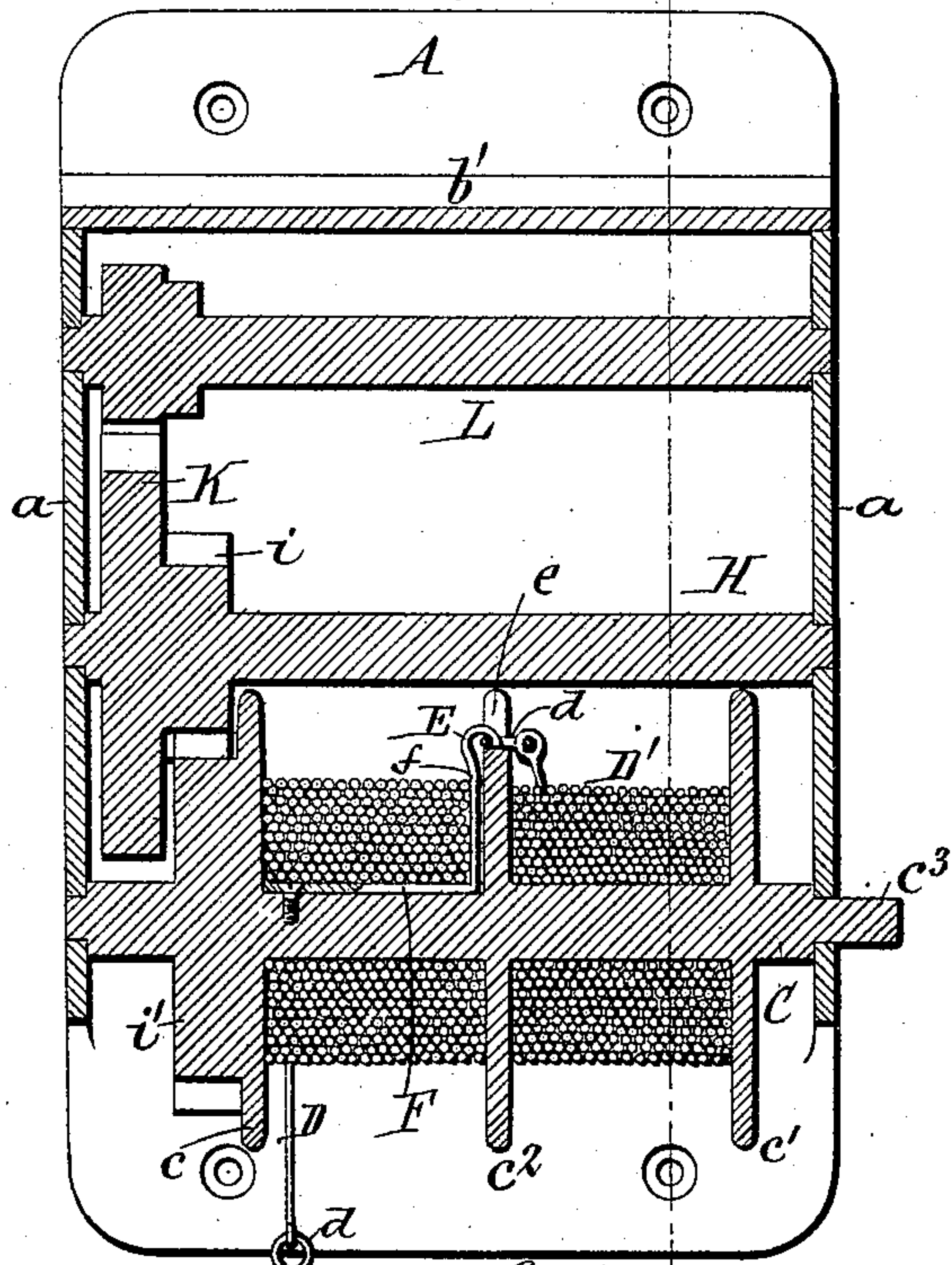


Fig. 3.

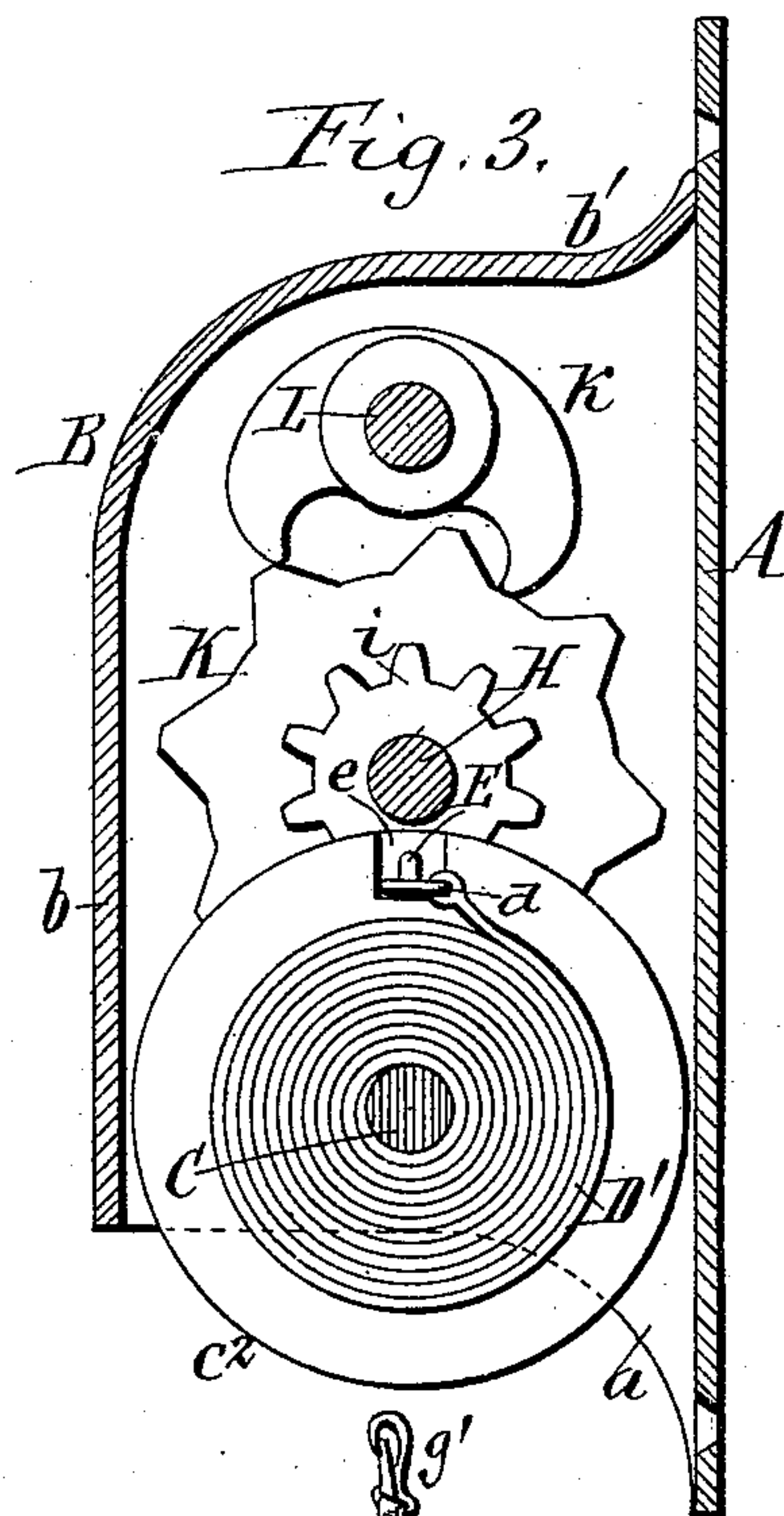


Fig. 4.

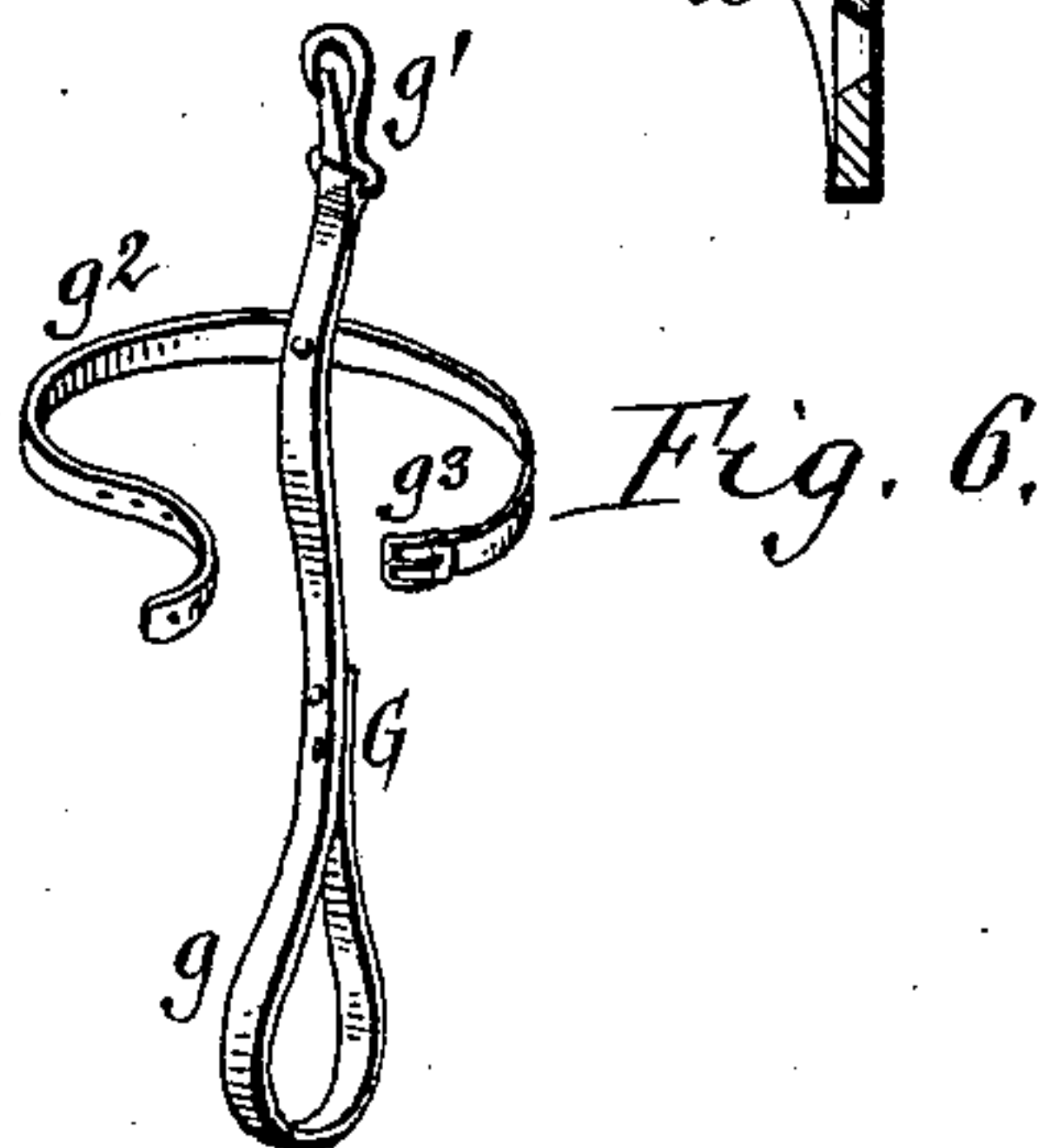
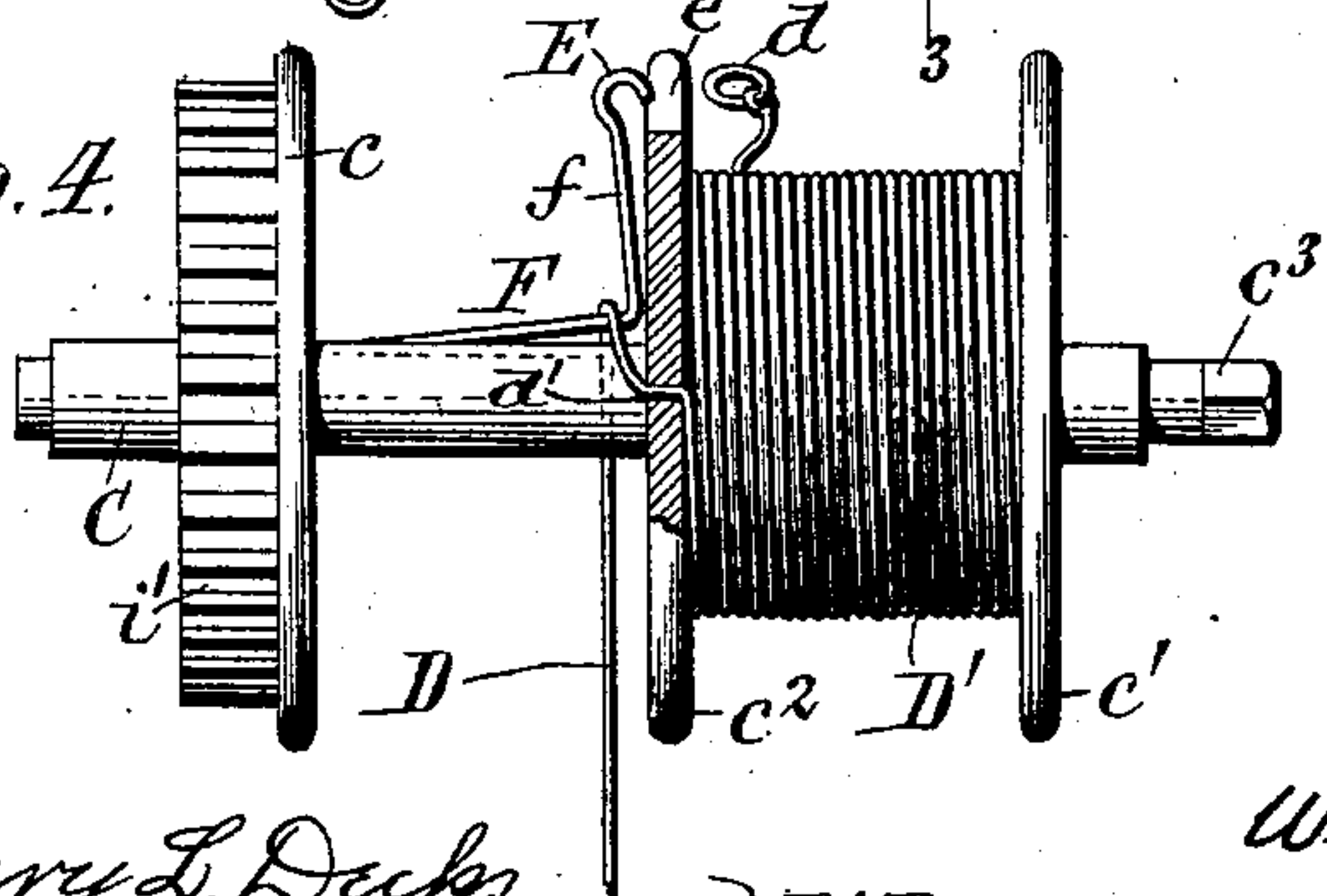


Fig. 6.

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FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 636,480, dated November 7, 1899.

Application filed June 9, 1899. Serial No. 719,868. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. ABBOTT, a citizen of the United States, residing at Kittanning, in the county of Armstrong and State of Pennsylvania, have invented new and useful Improvements in Fire-Escapes, of which the following is a specification.

This invention relates to that class of fire-escapes which consists, essentially, of a drum, a cord or rope wound upon the drum, and a retarding device whereby the rotation of the drum is retarded as the cord unwinds from the drum by the weight of the escaping party.

One of the objects of this invention is to produce a simple and efficient fire-escape of this character which has comparatively few parts and in which two cord-drums are employed, so that when one cord is unwound by the weight of an escaping party the other is wound upon its drum ready to be used by another party.

Another object of my invention is to provide means which permit both cords to be wound upon their drums when not in use, so that the apparatus is more sightly, and still prevents one cord from being unwound until the other cord has been unwound, thereby avoiding confusion.

My invention has the further object to provide an inclosing casing for the fire-escape mechanism which is simple, durable, and inexpensive in construction and which can be readily opened to permit of inspecting or adjusting the parts.

In the accompanying drawings, Figure 1 is a perspective view of my improved fire-escape. Fig. 2 is a vertical longitudinal section thereof, showing both ropes wound upon their drums. Fig. 3 is a vertical cross-section taken in line 3 3, Fig. 2. Fig. 4 is an elevation, partly in section, of the drums and connecting parts, showing the first rope unwound and the second rope released. Fig. 5 is a horizontal section of the inclosing case. Fig. 6 is a perspective view of the harness which may be used for fastening the escaping party to the escape-rope.

Like letters of reference refer to like parts in the several figures.

A represents the back plate or base of the inclosing case, which is provided with suitable screw-holes for securing the same to any suitable part of the window-frame or wall adjacent to the window. This back plate is provided on its opposite vertical edges with two vertical side plates or walls *a a*, which extend forwardly and each of which is provided at its front end with an outwardly-projecting vertical tongue or flange *a'*.

B represents the cover of the inclosing case, which forms the front and top of the case and which consists of a front plate *b*, extending from the front edge of one of the side plates *a* to the front edge of the other side plate, and a top plate *b'*, which extends across the space between the top edges of the side plates. This cover is provided along the edges of its front plate with inwardly-facing vertical grooves *c³*, which engage with the flanges of the side plates. The cover is applied to the side plates by slipping its grooved edges downwardly from the upper ends of the flanges until the top of the cover bears against the top edges of the side plates. When the two parts of the casing are thus assembled, the cover prevents the side plates from spreading and a casing is produced which is closed on all sides except at the bottom, where it is left open to afford access to the escape devices. The back plate, side plates, and the flanges are preferably stamped or bent up out of a single sheet of metal, and the cover, with its grooved edges, is also stamped out of a single piece of sheet metal, thereby producing a neat casing, which is very simple and strong and which can be produced at small cost.

C represents a horizontal shaft which is journaled with its ends in bearings formed in the side plates of the casing and which is provided with two side disks *c c'* and an intermediate disk *c²*, forming two drums on the shaft.

D D' represent two escape lines, ropes, or cords, each of which is wound around one of the drums and is secured with its inner end to the drum and provided at its outer end with an attaching or suspending ring *d*. The rope of one drum is wound thereon in a direc-

tion opposite to that in which the other rope is wound upon its respective drum, which causes one rope to wind up on its drum and the other rope to unwind from its drum upon turning the drums together in one or the other direction. The two lines $D D'$ are preferably formed out of a single or continuous piece of wire or wire rope, which is doubled midway of its length, so as to form the two branches constituting the two lines. This manner of forming the two lines is equivalent to uniting or connecting the inner ends of the two lines and does not affect their operation as two individual lines. The bight formed in the doubled middle part of the two connected lines or ropes passes through an opening d' in the intermediate disk c^2 , as shown in Fig. 4, and from this opening the two rope branches trend in opposite directions around their respective drums. The wire ropes are secured in this opening by means of the bend produced in the same at the opening and also by reason of one rope being wound upon its drum while the other is being unwound. This manner of attaching the ropes to the drums is very secure, and also permits of conveniently adjusting the length of the ropes to the height of the room in which the fire-escape is being installed.

When the fire-escape is not in use, both the ropes are wound around the drums, so as to avoid any unsightliness in the room in which the fire-escape is installed, which otherwise would be the case if one rope were left dangling in an unwound condition from the fire-escape.

In order to prevent both ropes from being partly unwound from their drums, and thus create confusion when the fire-escape is needed, a locking device is provided which permits only one of the wound-up ropes to be unwound, while the other is held against unwinding by the locking device until the first rope has been unwound, after which the second rope is released and can also be unwound from its drum. As shown in Figs. 2, 3, and 4, this locking device consists of a hook or catch E , which is adapted to engage with the ring d at the free end of the rope D' and bears against the bottom of a recess e in the edge of the intermediate disk, so that the ring is fastened to this disk and its rope cannot become unwound. This catch is normally moved away from the bottom of the recess by a flat spring F , which is arranged lengthwise to this portion of the drum-shaft, around which the rope D is wound, and which is secured at one end of this shaft adjacent to the disk c , while its opposite free end is connected with the catch by a radial arm f , which lies close to the intermediate disk c^2 on that side against which the rope D is wound. The rope D' is first wound upon its drum by turning the drum-shaft in one direction by means of a crank applied to the flat-sided end c^3 of the drum-shaft. After the rope D' is wound up its ring d is engaged with the catch E , and the latter

is pressed with its end against the bottom of the recess e , so as to confine the ring d of the rope D' , and at the same time the drum-shaft is turned in the opposite direction, so as to wind the other rope D around the drum-shaft. As the rope D is wound up it winds around the spring F as well as around the drum-shaft, and the spring is thereby drawn inwardly against the drum-shaft, whereby the catch is held in engagement with the ring of the rope D' , as represented in Figs. 2 and 3, and the latter cannot be unwound so long as the rope D is wound around the shaft and the spring. The fire-escape is left in this position ready for use, with only the ring of the rope D hanging slightly below the casing, as shown in Figs. 1 and 2. The party desiring to escape grasps the rope D and is lowered to the ground by the unwinding of the rope from its drum, and when the last coil of this rope has been unwound from the shaft the spring F , owing to its resilience, moves outwardly and disengages the catch from the ring of the rope D' , as represented in Fig. 4. The rope D' is now free to be unwound from its drum for the purpose of permitting another party to effect an escape from the building. The unwinding of the rope D' by reason of a party descending on the same causes the other rope D to be rewound upon its drum ready to be used again. The ropes may be used alternately in this manner indefinitely, because the winding up of the rope D only causes the catch to bear against the bottom of the recess, but does not again lock the other rope D' until the ring of the latter is purposely slipped on the catch before the first layer of coils of the rope D have been wound up. It will thus be seen that the rope D' is reliably locked until the rope D has been unwound and is then automatically released without requiring any attention on the part of the party using the same, thereby avoiding confusion and tangling of the ropes, which otherwise would impair the usefulness of the fire-escape.

If desired, the escaping party may be provided with a harness, which is attached to the escape-rope, this harness, as shown in Fig. 6, consisting, preferably, of a longitudinal strap G , provided at its lower end with a loop g , into which the leg of the party is inserted, and at its upper end with a snap-hook g' , which engages with the ring d of either escape-rope, and a belt g^2 , which is secured transversely to the upper part of the longitudinal strap and is provided with a buckle g^3 for fastening the belt around the body of the escaping party.

The rotation of the drum-shaft in either direction may be retarded by any suitable means, so as to check the descent of the escaping party, the preferred means for this purpose being an escapement mechanism, which is shown in Figs. 2, 3, and 4 and which is constructed as follows: H represents a horizontal escapement-shaft, which is arranged above the drum-shaft and journaled

with its ends in bearings formed in the side plates of the casing. The escapement-shaft is provided with a gear-pinion i , which meshes with a gear-wheel i' , arranged on the drum-shaft on the outer side of the drum-disk c . The escapement-shaft is provided on the outer side of its pinion with a toothed escapement-wheel K , which is engaged by the two arms or jaws of a vibrating escapement-pallet k . The latter is arranged on a horizontal shaft L , which is arranged above the escapement-shaft and journaled with its ends in bearings formed in the side plates of the casing. Upon turning the drum-shaft in either direction this movement is transmitted by the gear-wheels to the escapement-wheel, and the rotation of the latter vibrates the escapement-pallet and causes the rotation of the drums to be retarded.

For the purpose of simplifying the construction of the fire-escape and insuring reliability the drum-shaft and its disks and gear-wheel are cast in one piece, the escapement-shaft and its gear-pinion and escapement-wheel are cast in one piece, and the pallet-shaft and its pallet are cast in one piece. If desired, however, the parts mounted on each shaft may be made separate therefrom and secured thereto by keys, set-screws, or otherwise. The several shafts are placed in their supporting-bearings by removing the cover of the casing and then springing the side plates outwardly sufficiently to permit of inserting the ends of the shafts in their bearings. The cover is then slipped on the side plates of the casing, whereby the side plates are held in place and the shafts are prevented from leaving their bearings. If desired, the cover may be locked or otherwise secured to the side or back plates, so as to prevent tampering with the fire-escape.

The disks c c' c'' of the drum-shaft extend close to the escapement-shaft, whereby this shaft serves as a guard to prevent the ropes when being wound upon the drums from climbing on the edge of the disks and becoming displaced.

I claim as my invention—

1. An inclosing case for a fire-escape consisting of a back plate, two side plates pro-

jecting forwardly from the back plate, and a cover having a front plate which slides upon the front ends of the side plates and a top plate which bears against the top of the side plates, substantially as set forth.

2. The combination with two drums and two ropes adapted to be wound upon said drums, of a locking device which holds the rope of one drum against unwinding and which is controlled by the rope of the other drum, substantially as set forth.

3. The combination with two drums and two ropes adapted to be wound upon said drums, of a catch which is held in engagement with the end of one of said ropes by the coils of the other rope, and a spring whereby said catch is disengaged from the rope which it holds when said coils are unwound, substantially as set forth.

4. The combination with a drum-shaft provided with two drums and two ropes wound upon said drums, of a catch adapted to engage with the end of one of said ropes and hold the same against unwinding, a spring which is secured to the drum-shaft and which is pressed inwardly by the coils of the other rope when wound upon its drum, and an arm connecting said spring with said catch, substantially as set forth.

5. The combination with a drum-shaft provided with two side disks and an intermediate disk forming two drums upon said shaft, and the ropes adapted to be wound upon said drums, of a catch adapted to bear with its end against the bottom of a recess in the intermediate disk and engage with a ring on the end of one of said ropes, so as to hold the same against unwinding from its drum, a flat spring which is secured lengthwise to the drum-shaft and which is pressed inwardly by the coils of the other rope when the latter is wound upon its drum, and an arm connecting the free end of the spring with said catch, substantially as set forth.

Witness my hand this 29th day of May, 1899.

WILLIAM O. ABBOTT.

Witnesses:

W. D. JESSOP,
JOHN J. DAVIS.