

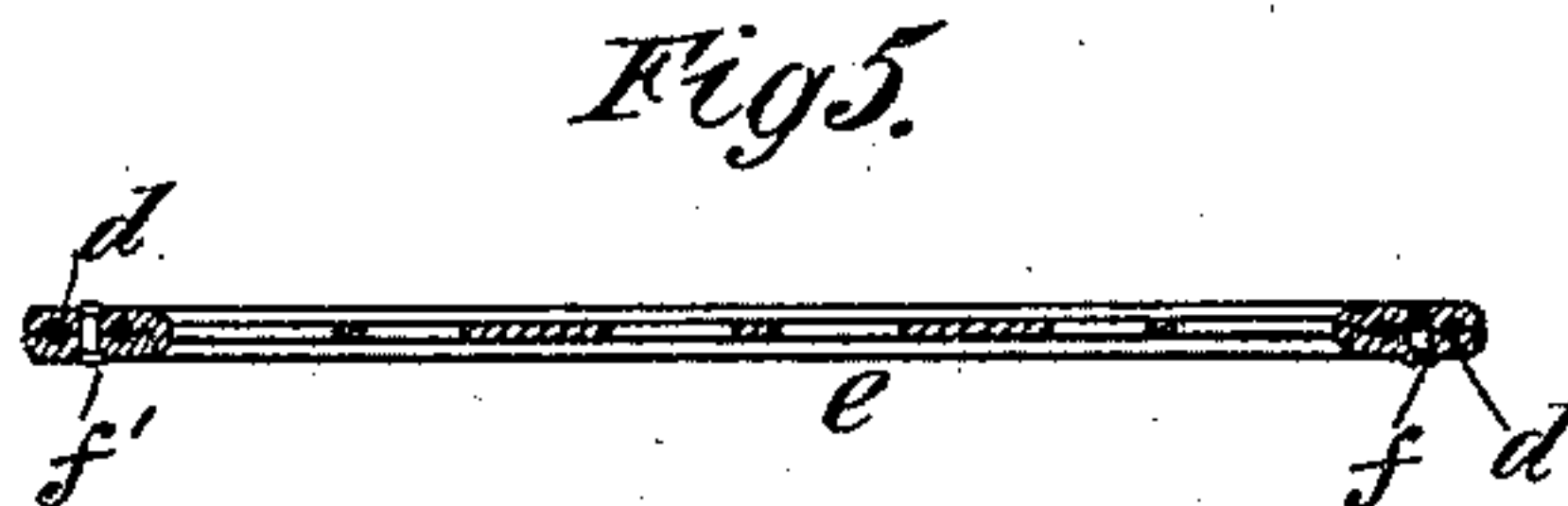
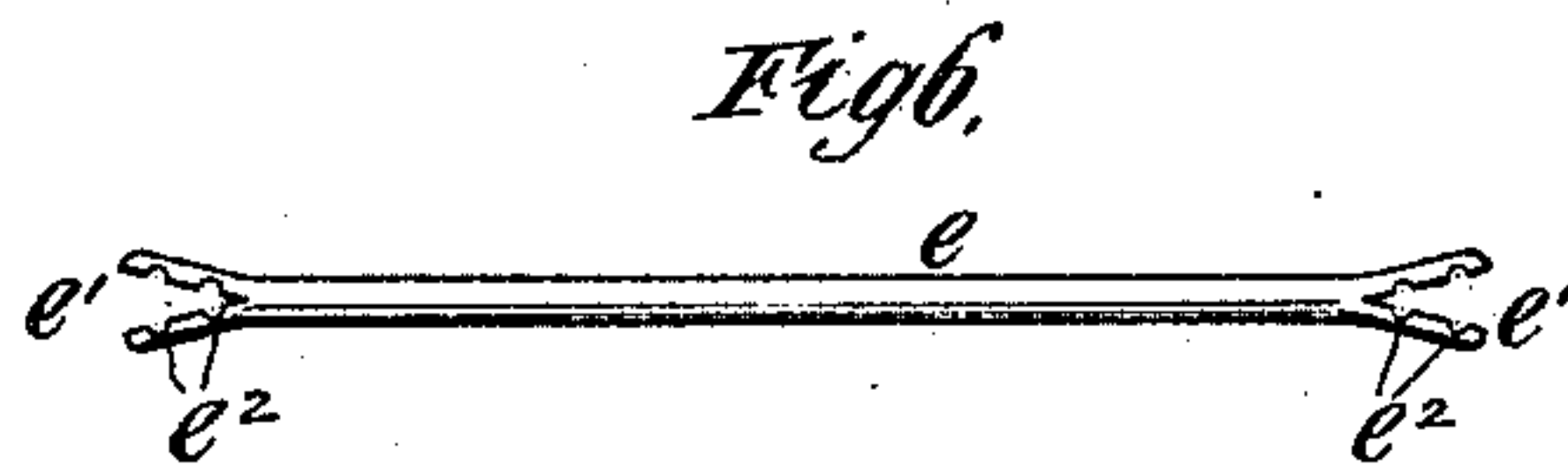
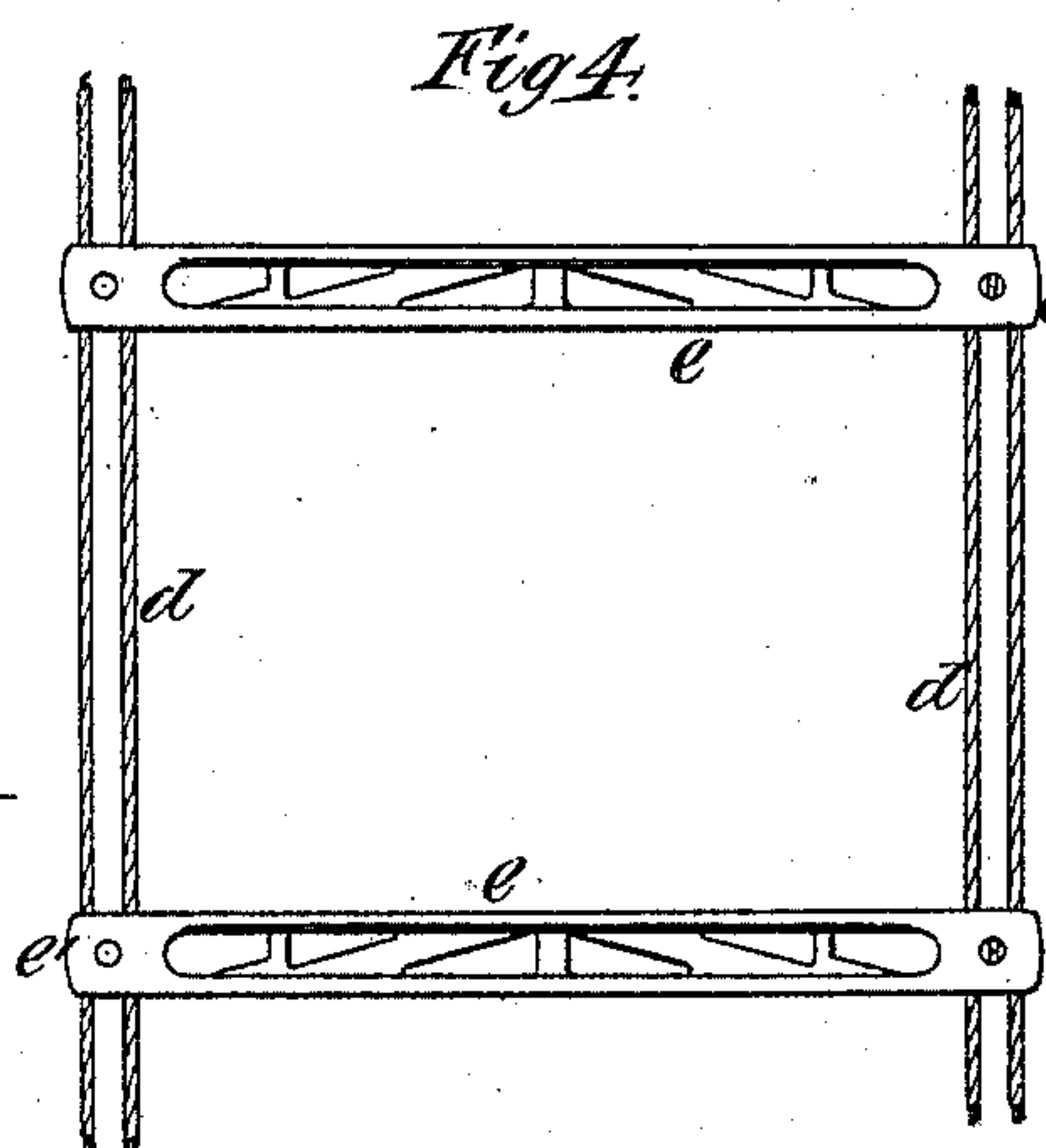
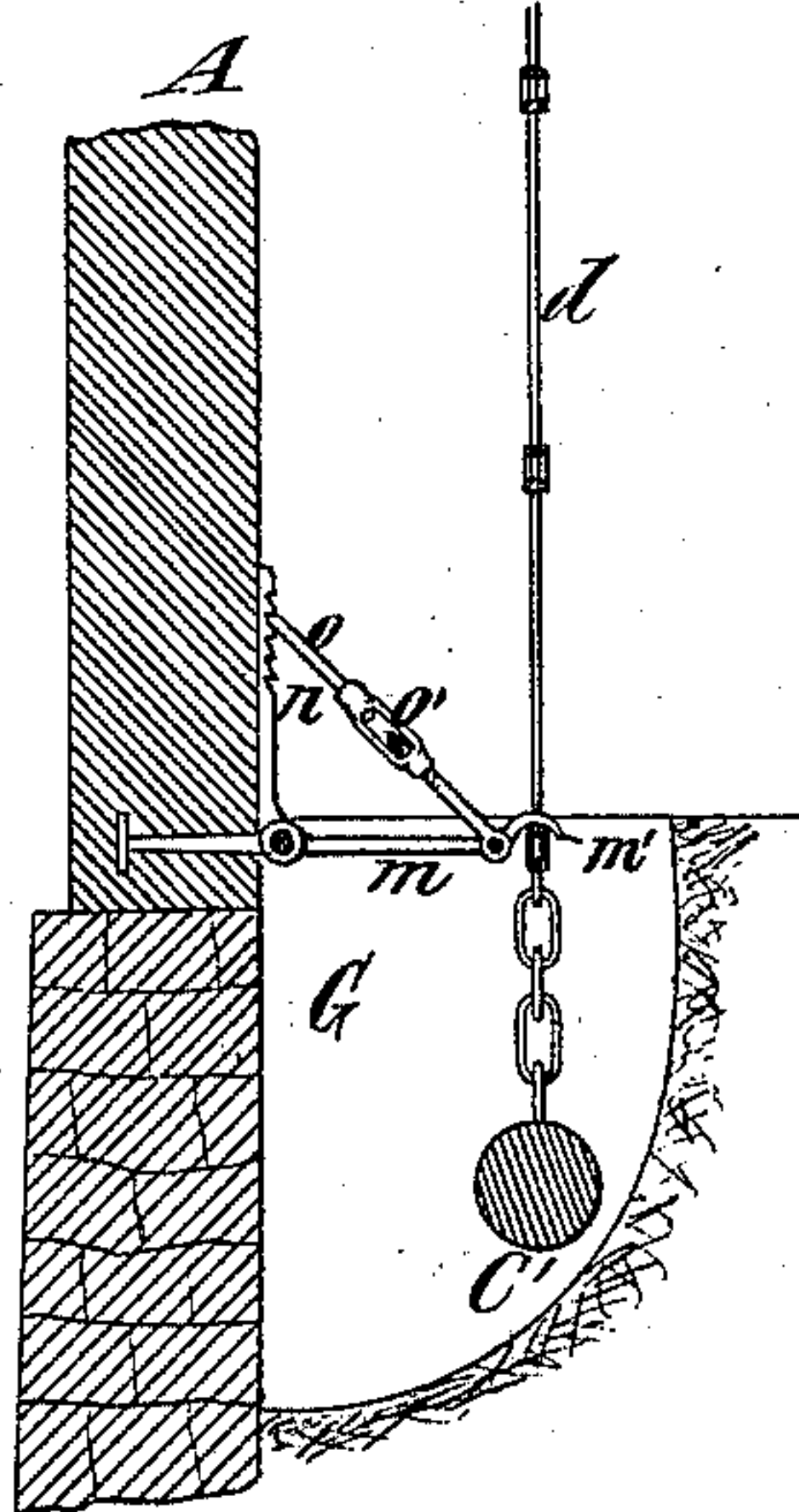
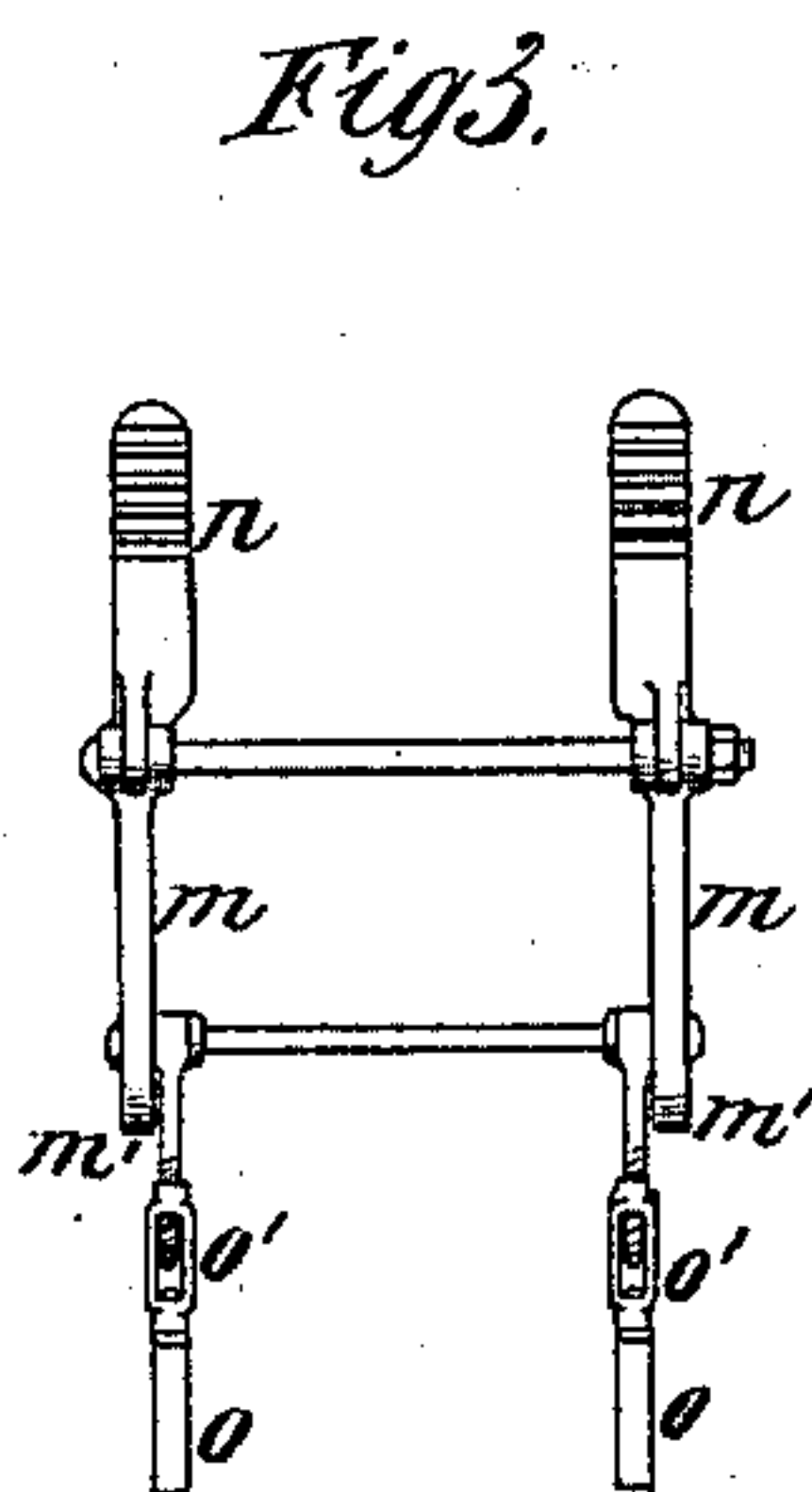
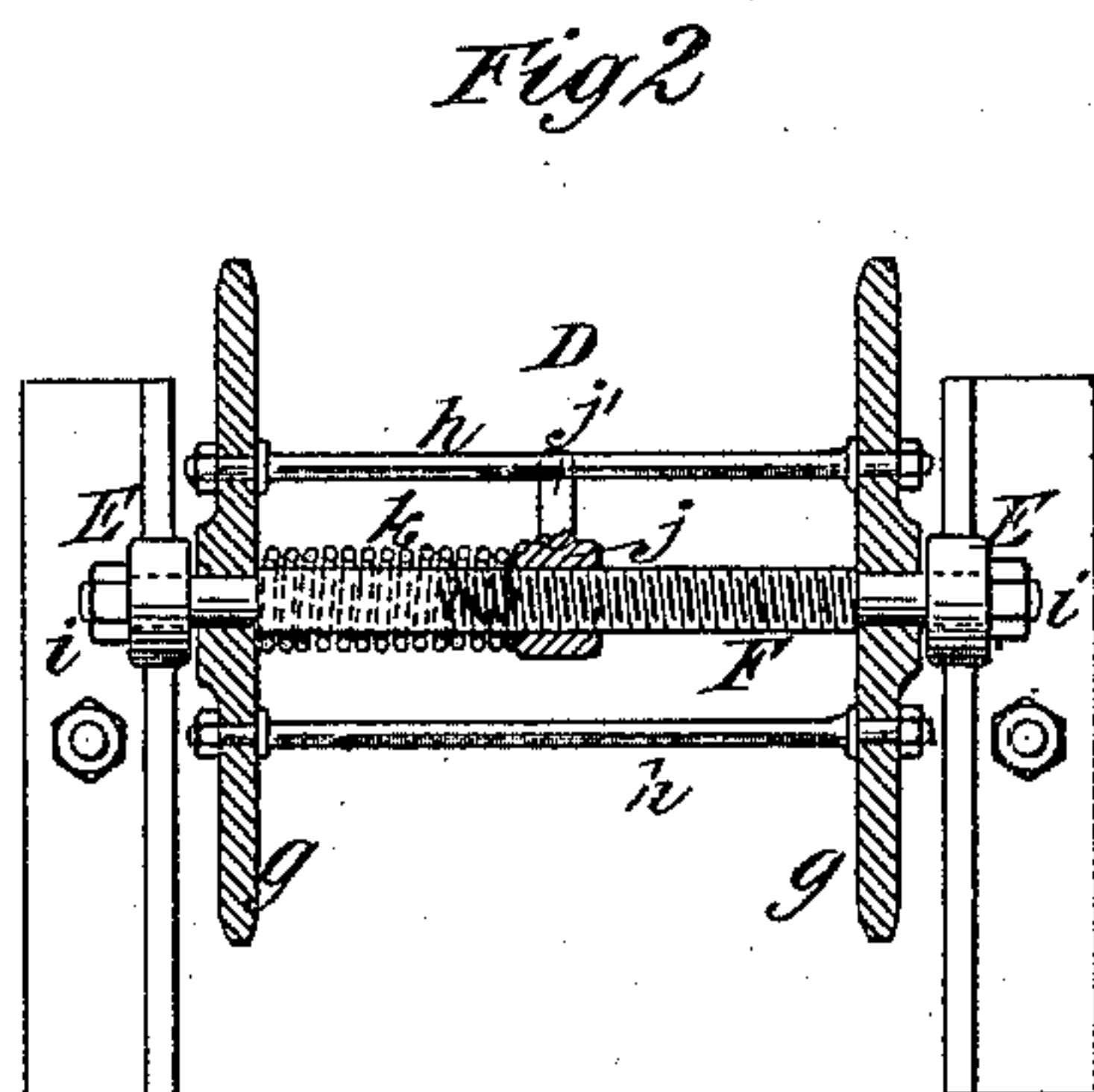
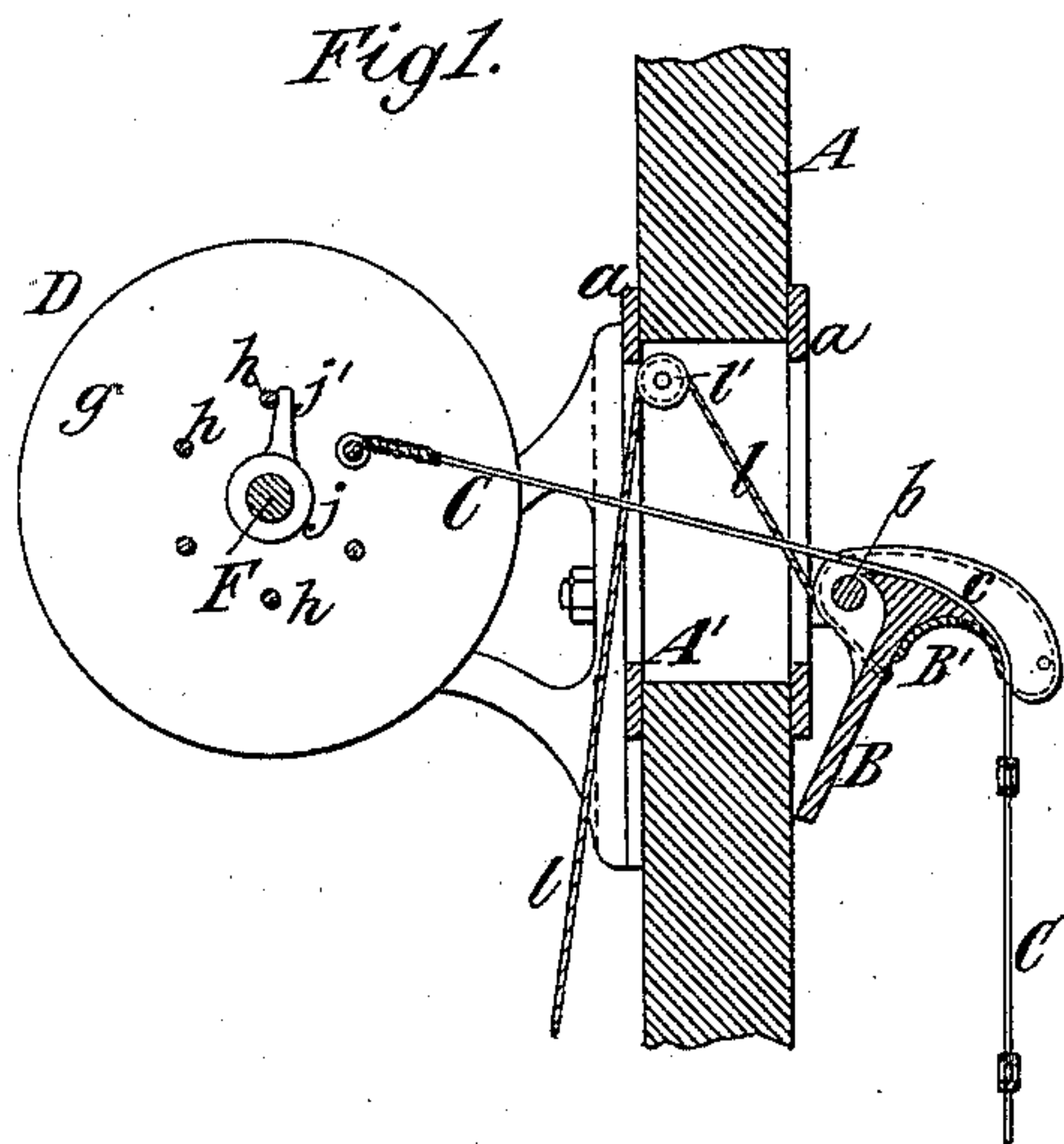
(No Model.)

G. H. CLOWES & E. L. FRISBIE, Jr.

FIRE ESCAPE.

No. 283,969.

Patented Aug. 28, 1883.



Witnesses:
Jus W. Vayner
Ed. L. Moran

Inventor:
George H. Clowes
Edward L. Frisbie, Jr.
by their Attorneys
Brown & Brown

UNITED STATES PATENT OFFICE.

GEORGE H. CLOWES AND EDWARD L. FRISBIE, JR., OF WATERBURY, CONN.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 283,969, dated August 28, 1883.

Application filed January 10, 1883. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. CLOWES and EDWARD L. FRISBIE, Jr., both of Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Fire-Escapes, of which the following is a specification.

Our invention relates to fire-escapes which consist of a flexible ladder which, when not in use, is wound upon a rotary reel, and which runs out when desired for use.

The invention consists in a novel means for offering a constantly-increasing resistance to the rotary movement of the reel as the ladder is run out, so that the resistance will at all times be proportioned to the weight of the depending ladder, and so that the reel will come to a stop gradually and without violent shock.

The invention also consists in a flexible fire-escape ladder of novel construction, hereinafter described.

The nature of our invention is illustrated in the accompanying drawings, in which Figure 1 represents a sectional elevation of the wall of a building and our improved fire-escape applied thereto. Fig. 2 represents a longitudinal section of the reel. Fig. 3 represents a view of the devices employed to hold the lower end of the ladder when run out. Fig. 4 represents a portion of our improved ladder on a larger scale. Fig. 5 represents a transverse section of the ladder, and Fig. 6 represents a view of one of the rungs of the ladder.

Similar letters of reference designate corresponding parts in all the figures.

A designates the wall of a building, portions of which are broken away. In the upper part of this wall is an opening, A', which is or may be protected by frames a, and which is provided with a door, B, hinged at b. In Fig. 1 the door is represented as open, and on its inner side is formed a cradle, B', the under side of which, when the door is swung open, forms a saddle, c, over which a flexible ladder, C, may run out. The ladder C may be provided at the lower end with a weight, C', and when the door is closed said weight rests in the cradle B', and as the weight thereof falls inside the hinges b the door will be held closed. When the ladder is drawn up, the weight C' catches under said cradle B' and closes the door automatically.

So far as the other features of our invention are concerned, the ladder C may be of any desired construction; but a very desirable construction of ladder is shown in Figs. 4, 5, and 6. The side portions of the ladder each consist of one or more ropes, of wire or other suitable material, d, two being here shown, and the rungs e are split or divided at the ends e', so as to form jaws, between which the ropes d are secured. The inner sides or faces of these jaws are grooved or recessed at e² to fit the ropes, and the grooves or recesses may be formed entirely in one jaw or partly in both, as shown in Fig. 6. The rungs e may be made of malleable iron or any other suitable material, and after the ropes d are placed between the jaws the latter are closed upon them and also clamped by screws or rivets, so as to hold the rungs in place on the ropes. In Fig. 5 I have shown the right hand of the rung as clamped on the ropes by a screw, f, and the left-hand end is clamped by a rivet, f'. Either device may be used. It will also be observed that the grooves or recesses e² hold the ropes d at the proper distance apart.

D designates a reel, mounted in hangers E on the inner side of the wall A and opposite the opening A'. The reel here shown consists of two heads or flanges, g, connected by a circular series of rods or ties, h, and adapted to turn freely on a rod or arbor, F, which is supported in the hangers E, and is held against turning. In this example of our invention the arbor F has nuts i on its ends, and these nuts may be set up tightly to hold the arbor fixed in the hangers. The arbor F is screw-threaded for the whole or a part of its length, and has a nut, j, applied to it. The said nut has a tail or projection, j', which bears against one of the rods or ties h, and hence when the reel turns the said nut is also turned, and is thereby caused to traverse the fixed arbor longitudinally. Between the nut j and one of the flanges or heads g, or a shoulder on the arbor F, is arranged a spiral spring, k, and as the reel is turned to pay out the ladder or to allow it to run out the nut j is caused to compress said spring k; but when the reel is turned to wind up the ladder the nut is caused to release the spring and allow it to expand. When the ladder is allowed to run out, the nut j turns and compresses the spring k; but the spring,

as it is compressed, offers a constantly-increasing resistance to the rotation of the reel, and this resistance is at all times proportioned to the increasing weight of the depending ladder.

- 5 The spring should be adjusted so that as the running out of the ladder is finished the reel will be stopped without violent shock.

When the fire-escape is not in use, the ladder is reeled up and the door B is held closed,
10 as before described.

When it is desired to use the fire-escape, a cord or connection, *l*, which passes over a pulley, *l'*, and under the door B to the outer side thereof, is pulled, and the door is thereby
15 opened. The weight *C'* on the latter then starts the latter forward, and it runs out automatically.

m designates arms or bars, which are hinged at one end to supports anchored in the wall,
20 and have at the other ends hooks *m'*, which are adapted to rest on a rung of the ladder, as shown in Fig. 1. Against the face of the wall A, and in the same vertical planes as the hooked arms or bars *m*, are fixed ratchet-bars *n*; and
25 *o* designates braces, which are hinged to the bars *m* near their outer ends, and the other ends of which may engage with the ratchet-bars *n*, as shown in Fig. 1. The braces *o* are provided with turn-buckles *o'*, and these turn-
30 buckles may be manipulated to lengthen the braces and put a tension on the ladder. When not in use, the arms or bars *m* and braces *o* will hang down against the wall, as shown in

Fig. 3; and, if desirable, there may be made a hole, G, into which the end of the ladder depends when run out. 35

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the flexible ladder C, hinged arms or bars *m*, ratchet-bars *n*, and
40 braces *o*, provided with turn-buckles *o'*, substantially as herein described.

2. The combination of a flexible fire-escape ladder, a reel therefor, a fixed arbor on which the reel may rotate and which is screw-threaded,
45 a spiral spring upon said arbor, and a nut fitting said screw-threaded arbor and connected with the reel so as to turn therewith, substantially as and for the purpose herein described.

3. The combination of the ladder C, the reel
50 consisting of heads or flanges *g* and tie-rods *h*, the screw-threaded fixed arbor F, the spring *k*, and the nut *j*, engaging with said reel, substantially as herein described.

4. The combination, with ropes forming the
55 side portions of a ladder, of rungs divided or split at the ends, and provided with grooves or recesses *e'*, which receive said ropes, and devices inserted through the divided or split ends of the rungs for clamping them upon the
60 ropes, substantially as herein described.

GEO. H. CLOWES.

EDWARD L. FRISBIE, JR.

Witnesses:

FRANKLIN C. HOLMES,

ORVILLE R. KELSEY.