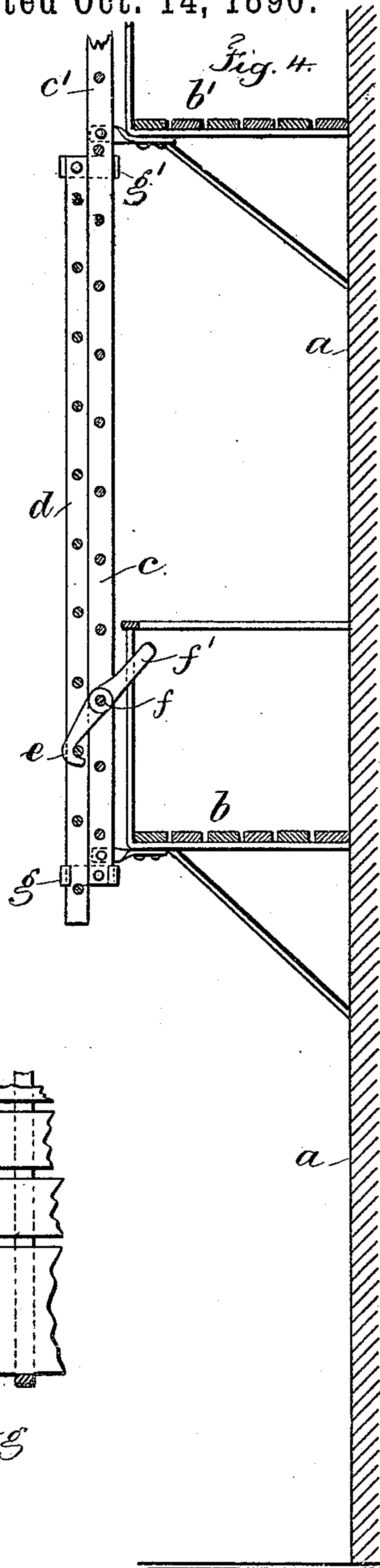
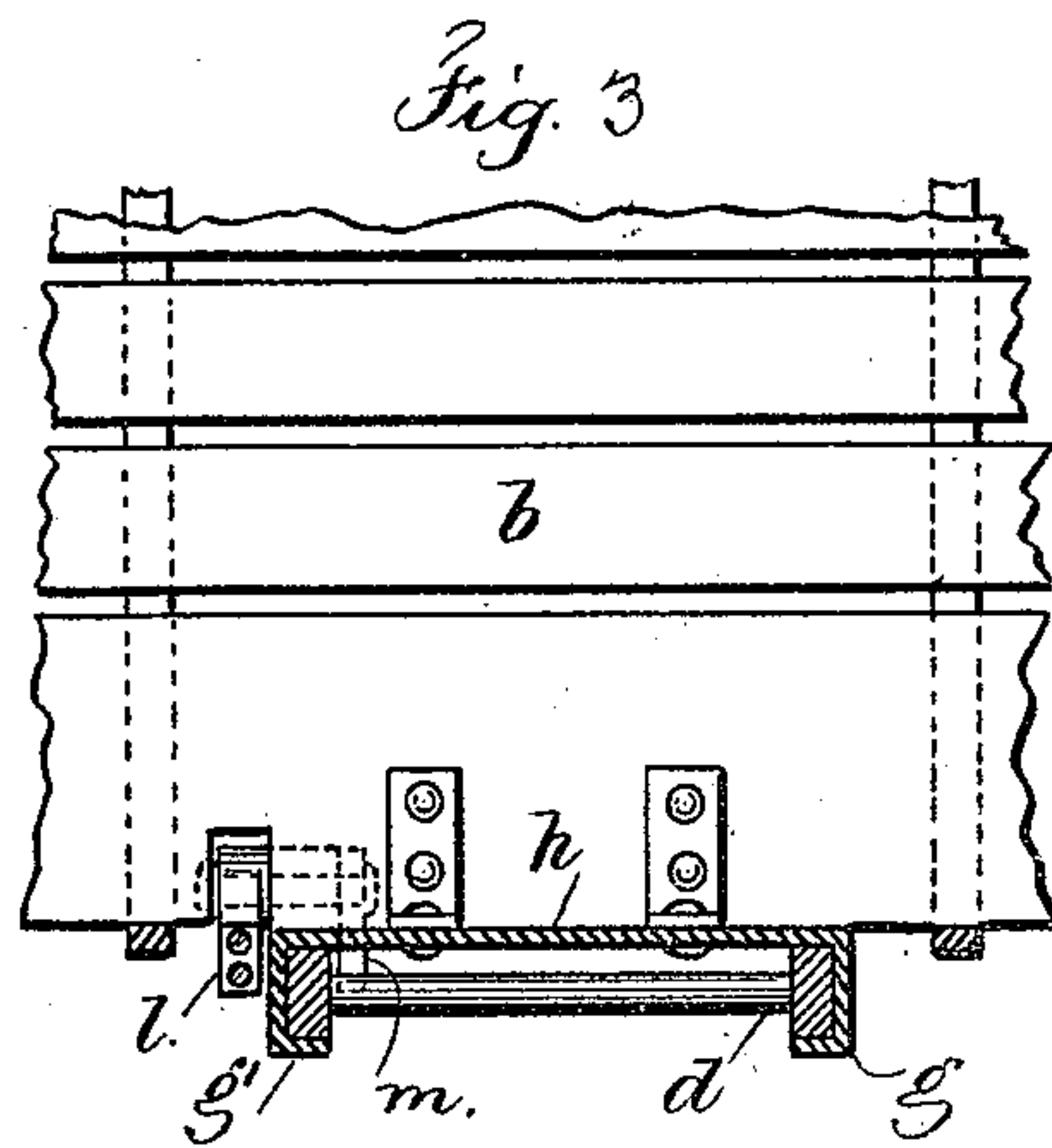
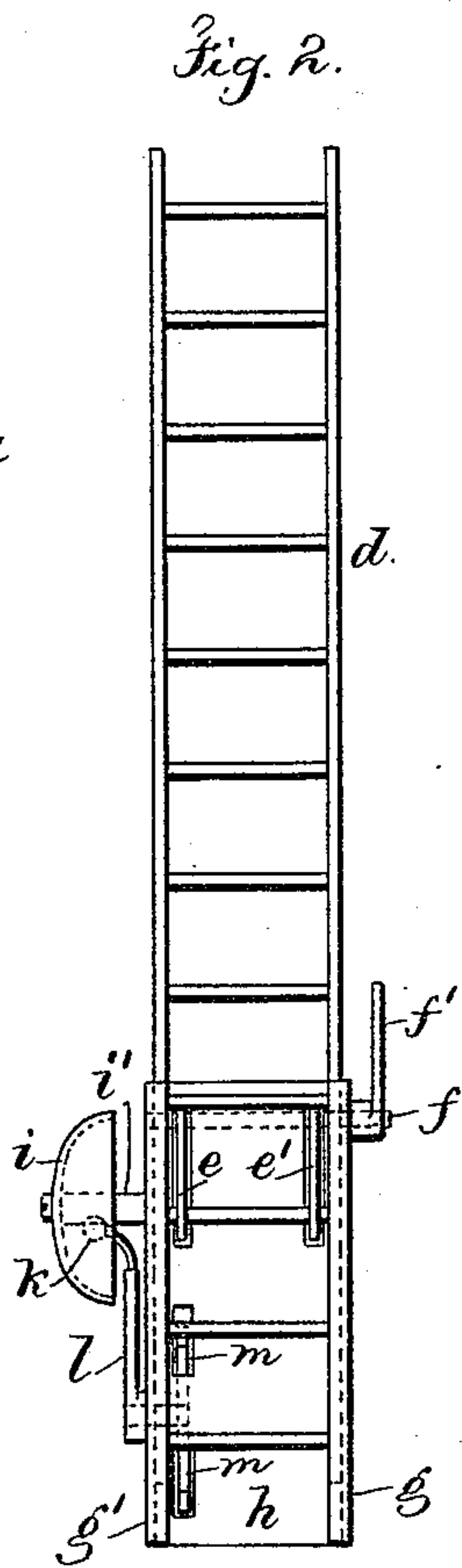
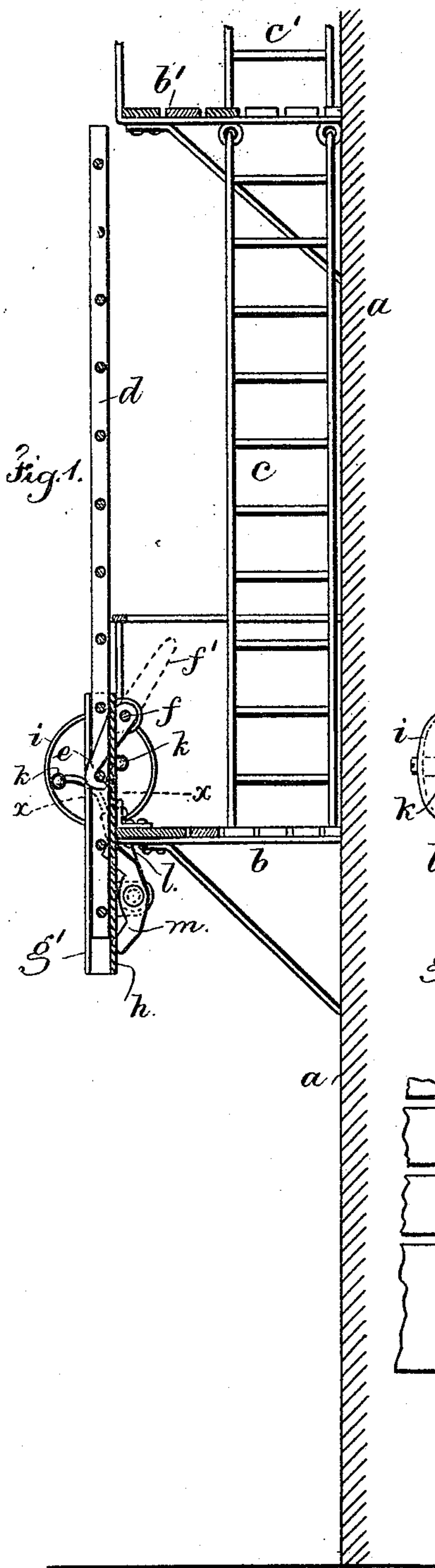


(No Model.)

C. F. SHAIN.  
FIRE ESCAPE LADDER.

No. 438,387.

Patented Oct. 14, 1890.



Witnesses  
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# UNITED STATES PATENT OFFICE.

CHARLES F. SHAIN, OF NEW YORK, N. Y.

## FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 438,387, dated October 14, 1890.

Application filed July 28, 1890. Serial No. 360,185. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. SHAIN, a citizen of the United States, residing in the city, county, and State of New York, have invented an Improvement in Fire-Escape Ladders, of which the following is a specification.

Fire-escape ladders are usually employed upon the outside of buildings in connection with balconies, there being a ladder from one balcony to the next lower, and a removable ladder at the lower balcony that is adapted to reach the ground. These ladders have been connected vertically upon the outside of the balcony and also within the balcony, but difficulty has arisen in employing the ladder reaching from the lower balcony to the ground in case of emergency, and these ladders sometimes become detached and lost and may sometimes be employed by burglars as a means of entering houses or apartments by giving access from the ground to the fire-escape and balconies.

The object of my invention is to provide an extension-ladder connected to the balcony nearest the ground, which ladder is always ready to drop to the ground at a moment's notice, but it cannot be reached from the ground.

My invention consists of an extension-ladder that is adapted to slide through stationary guides, which guides are connected to the balcony or to the ladder extending from the first to the second balcony; and I employ two hooks upon one cross-shaft, which hooks are adapted to engage either rung of the extension-ladder, and these hooks are operated from the first balcony by a handle upon said shaft, and I employ a bell with a rocker or escapement that is adapted to be operated by the rungs of the extension-ladder as the same descends, so that with the descent of the ladder an alarm is rung on the bell.

In the drawings, Figure 1 is a vertical section of my improved fire-escape ladder, together with the balconies of a building. Fig. 2 is an elevation of the ladder and its guide-plate. Fig. 3 is a sectional plan of the same at  $x x$  of Fig. 1, and Fig. 4 is a vertical section of a modified form of said ladder.

$a$  represents the face of a building;  $b b'$ , balconies connected to said building.  $c c'$  represent stationary ladders from one balcony

to the next above, and  $d$  represents the movable extension ladder.

$e e'$  represent hooks upon a shaft  $f$ , which extends across between the side bars of the ladder, and is provided outside of one side bar with a handle  $f'$ , by which the shaft is partly rotated and the hooks operated. These hooks  $e e'$  support and hold up the movable ladder in its elevated position.

$g g'$  represent guideways for the moving or extension ladder, and these guideways extend around the side bars.  $h$  is a guide-plate secured to the balcony  $b$  by angle-iron brackets, or in any other desired manner.

In Fig. 1 the guide-plate  $h$  and the guideways  $g g'$  are made as one piece, secured to the balcony  $b$ , and upon the back of said plate  $h$  there are bearings for the shaft  $f$ .

In the modification shown in Fig. 4 the stationary ladder  $c$  acts as a guide for the movable or extension ladder  $d$ , and in this case there are guideways  $g$ , riveted to the lower ends of the stationary ladder  $c$  and engaging the side bars of the movable ladder  $d$ , and guideways  $g'$ , secured to the upper end of the movable ladder  $d$  and engaging the side bars of the stationary ladder  $c$ , so that the stationary and movable ladder are inseparably connected, the ladder  $d$ , however, being free, so that it can move freely up and down over the face of the stationary ladder  $c$ . In this modification, Fig. 4, the shaft  $f$  forms one of the rungs of the ladder  $c$ , and the handle  $f'$ , by which the hooks  $e e'$  are to be operated to release the ladder  $d$ , may be at one end of the shaft  $f$  or between the side bars of the ladder  $c$ .

$i$  represents the gong of the bell, which I have shown as attached at one side of the guideways to a post  $i'$ , and  $k$  represents the hammers within the gong for striking the alarm. These hammers are connected to an arm  $l$ , and I provide a short shaft or stud to which the arm  $l$  is connected, and to which also the rocker or escapement  $m$  is connected, said shaft passing through a bearing upon the back of the plate  $h$ . This rocker or escapement has inclined ends that are adapted to be alternately operated upon by the rungs of the ladder as the same descends, said rungs imparting a vibratory movement to the rocker,



the hammer-arm, and the hammers to strike an alarm. This bell device can be equally well employed upon the modification shown in Fig. 4, as in this case the bell and the bearing for the rocker would be connected to the stationary ladder *c*. The bell device may, if desired, be secured in a recess in the plate *h* out of the way, where it would not be liable to be injured.

It will be apparent that when any one wishes to operate the extension-ladder *d* from the balcony *b* it will only be necessary to move the lever *f* to release the hooks *e e'* and the movable ladder and then to let go of the handle *f'*, which will permit the ladder to descend of its own gravity.

I do not limit myself to the movable extension-ladder and the device for operating the same connected to a stationary guide and guideways upon a balcony, as there are instances where fire-escape ladders are secured directly upon the face of a building by bracket-arms, and in which connection it would be desirable to employ my improvements.

I claim as my invention—

1. The combination, with a plate *h*, adapted to be secured upon a building, and guideways *g g'* formed therewith, of the ladder *d*, movable vertically through the guideways of said plate, a shaft *f* in bearings connected to the plate, hooks upon said shaft adapted to engage either rung of the ladder, and a handle by which the shaft *f* and hooks are operated to release the movable ladder, substantially as set forth.

2. The combination, with the balcony *b* and the fixed ladder *c*, of the guides *g*, connected with the balcony, the extension-ladder *d*,

sliding through the guides *g*, the stationary shaft *f*, the hooks *e*, projecting therefrom and adapted to engage either rung of the extension-ladder, and the handle *f'* for moving the shaft *f* and hooks *e*, substantially as set forth.

3. The combination, with a stationary guide having guideways, of a ladder movable vertically in said guideways, hooks for engaging the rungs of the movable ladder to suspend the same, a cross-shaft for said hooks, a gong *i*, hammer and a hammer-arm, a shaft, and a rocker or escapement *m*, whereby the descent of the movable ladder operates to strike an alarm upon the gong, substantially as set forth.

4. The combination, with the balcony *b*, of a plate *h*, and guideways *g g'* formed therewith, the ladder *d*, movable vertically through the guideways of said plate, a shaft *f* in bearings connected to the plate *h*, hooks upon said shaft adapted to engage either rung of the ladder *d*, and a handle by which the shaft *f* and hooks are operated to release the movable ladder, a gong *i* and post *i'* upon one guideway, hammers *k*, hammer-arm *l*, a shaft or stud to one end of which the hammer-arm is connected, a bearing for said shaft upon the back of the plate *h*, and a rocker or escapement *m* upon the other end of the shaft or stud, adapted to be operated by the rungs of the movable ladder as the same descends, substantially as set forth.

Signed by me this 25th day of July, 1890.

CHARLES F. SHAIN.

Witnesses:

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