

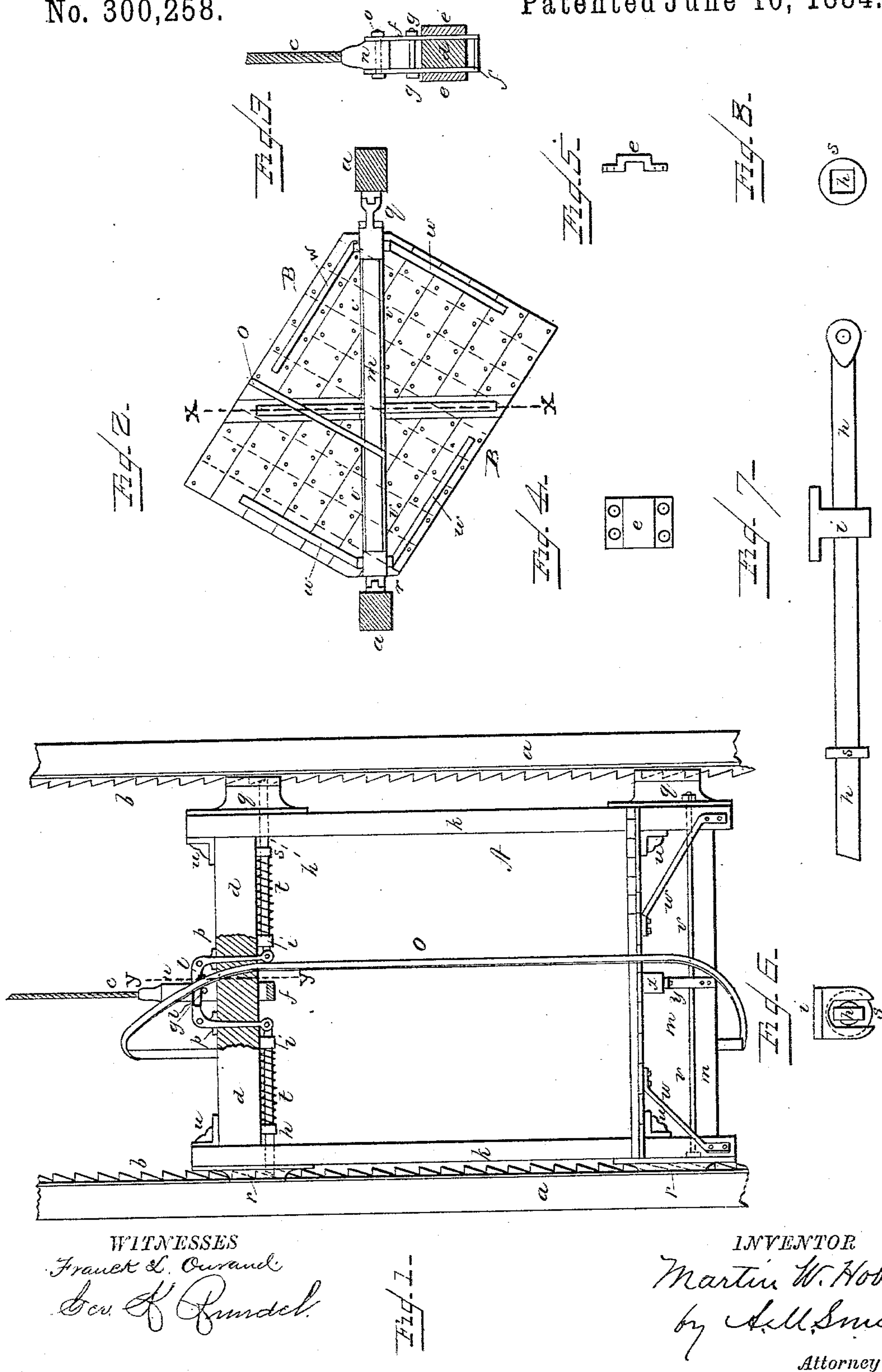
(No Model.)

2 Sheets—Sheet 1.

M. W. HOBEN.  
ELEVATOR.

No. 300,258.

Patented June 10, 1884.



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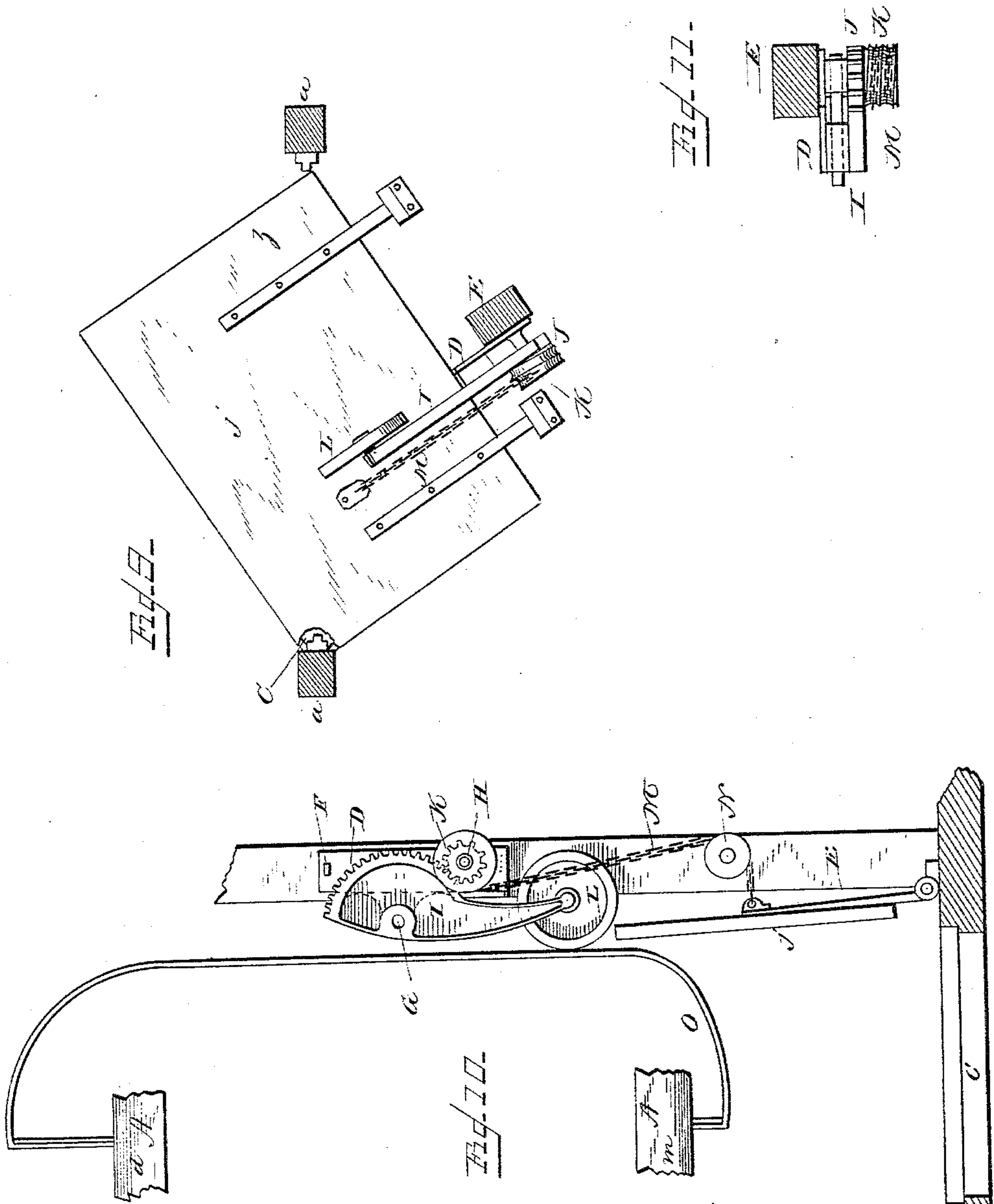
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# UNITED STATES PATENT OFFICE.

MARTIN W. HOBEN, OF COHOES, NEW YORK.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 300,258, dated June 10, 1884.

Application filed March 27, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN W. HOBEN, a citizen of the United States, residing at Cohoes, county of Albany, State of New York, have invented a new and useful Improvement in Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to that class of elevators employed in buildings or mines in which a pendent cab, cage, or platform, attached to the lower extremity of a rope, is raised or lowered between suitable guides from floor to floor, or from level to level.

My invention consists of certain details of construction, hereinafter described.

In the drawings, Figure 1 is an elevation of the cage, in which *a a* are the vertical guide-rails, *b b* the safety-racks, and *c* the rope or cable. Fig. 2 is an under side view of the parts shown in Fig. 1. Fig. 3 is a transverse vertical section of cross-head *d* and stirrup-guide plates *e*, taken on the line *y y* in Fig. 1, showing the sliding rope stirrup, link, or coupling *f* in elevation, attached to the rope or cable *c*, and carrying the cross bolt or stud *g*. Fig. 4 is a face view of the stirrup-guide plates *e*, and Fig. 5 is an end view of the same. Figs. 6, 7, and 8 are respectively end and side views of the spring-catch bolts *h* and guide *i*. Fig. 9 is a plan of the hinged hatch *j* and of a part of the automatic devices for opening and closing the same. Fig. 10 is a front elevation of the automatic devices for opening and closing the door, and Fig. 11 is a plan of a part of the devices shown in Fig. 10.

A is a rectangular frame, consisting of two uprights, *k*, a cross-head, *d*, and a lower cross-piece, *m*, so constructed and fastened to each other as to secure a maximum of strength and stiffness with a minimum of weight and bulk. The rope or cable terminates in a stub-end piece, *n*, to which the sliding rope stirrup is secured by a bolt, *o*; or the stirrup may be attached to the rope in any suitable manner. The stirrup incloses the cross-head at or near the center of its length, slips freely up and down for a sufficient distance, and is guided by a plate, *e*, on each side. Upon the cross bolt or stud *g* rest the extremities of the up-

per arms of the bell-cranks *l*. The bell-cranks are suitably hinged above the cross-head to hinges or fulcrums *p*. The lower arms of the bell-cranks pass down through slots in the cross-head, and connect with the ends of the spring-catch bolts *h*. The spring-catch bolts pass through the guides *i* and through suitable guide-slots or openings in the uprights *k* and guide-jaws *q* and *r*, and engage the teeth of the safety-racks *b*. Between the collar *s* of the catch-bolts and the guide *i* a stout spiral spring, *t*, is placed and partially compressed. When the rope is drawn upward, the bolt *g*, by lifting the upper arms of the bell-cranks, communicates motion through the bell-cranks to the clutch-bolts drawing them clear of the safety-rack teeth. The stirrup, link, or coupling, bringing up against the under side of the cross-head, lifts the cage. Should the upward pull of the rope cease, the stirrups will drop until the cross-bolt *g* rests upon the cross-head *d*, and the compressed spiral springs *t* will instantly force out the bolts *h*, causing them to catch the teeth of the safety-rack and prevent the cage from descending. The object of this part of my invention is to secure a more positive combination of devices than are in general use for the automatic working of the spring-catch bolts. The rope stirrup, link, or coupling *f* may have any form, and be guided in any manner suitable for the work herein designed to it.

B is the platform resting upon the upper face of the lower cross-piece, *m*. The platform is formed of two layers of planking crossing each other at or nearly at right angles, well bolted together with two bolts to each crossing, as indicated by the dots in Fig. 2. For this purpose I prefer to use "carriage-bolts" with the heads above and the nuts below. In the cage shown in the drawings the frame A is of wood, well stiffened with iron corner-pieces *u*, and strengthened with two or more cross-bolts, *v*. In order to have unimpeded access to the platform, the uprights *a* are made sufficiently stiff and the platform is braced entirely from below. To facilitate such bracing, the lower cross-piece, *m*, is made comparatively thin and deep. The upper corners of the lower cross-piece are cut away, as shown in the drawings, to lighten it and to



make room for the corner-pieces *u*. The up-  
rights *k* extend well down below the platform  
and below the cross-piece *m*, and the outer  
corners of the platform are supported by braces  
5 *w*, proceeding from near the lower extremities  
of the uprights. To still further stiffen and  
support the platform, I employ a truss formed  
of a transverse beam, *x*, let into the lower  
cross-piece, and two braces, *y*, proceeding  
10 from near the lower edge of the lower cross-  
piece and terminating near the edge of the  
transverse beam. The diagonal line or axis  
of the platform crosses the center line of the  
lower cross-bar at such an angle that the cor-  
15 ners of the platform are thrown a few inches  
out of and to opposite sides of the latter line.  
(See line *x x*, Fig. 2.) This I do in order that  
the edge *z* of the hinged hatch *j* may, in open-  
ing and closing, more readily clear the guide-  
20 rail. In order still more to increase the clear-  
ance of the edge *z* from the guide-rail, I em-  
ploy guide-jaws *q* and *r*, which project un-  
equally from the uprights, the wider or more  
projecting guide-jaws *q* being on the side of  
25 the edge *z*, as shown in the drawings.

C is a hatchway or opening in a floor through  
which the elevator-cage passes.

D is a steel plate secured to the post E by  
bolts F. Studs G and H of the stud-plates  
30 carry, respectively, the segment-lever I, pin-  
ion J, and drum K. The drum is fast to and  
moves with the pinion. The outer end of the  
segment-lever carries a presser-wheel L. The  
chain M forms a flexible connection between  
35 the drum K, and the hatch or door *j*, passing  
around the guide-sheave N.

O is the presser-rod, attached above to the  
cross-head *d*, and below to the lower cross-  
piece, *m*, of the cage A. If the cage ascends  
40 from below the closed hatch, the presser press-  
ing against the door forces it open, and the  
presser-wheel drops, bringing down the end  
of the segment-lever, the segment the while  
causing the pinion to revolve, revolving the  
45 drum with it, the chain winding upon the  
drum. The presser-rod pressing on the press-  
er-wheel in passing forces the parts into the  
position shown in Fig. 10, and holds them  
there until the cage has passed up out of  
50 the way, when the weight of the hatch causes  
it to close, unwinding the chain, and through  
the pinion and segment throws the segment-  
lever into a horizontal position, as shown in  
Fig. 9. When the cage descends again, the  
55 presser-rod pushes the segment-lever down  
again into the position shown in Fig. 10, open-  
ing the hatch to allow the cage to pass. By  
substituting a segment, pinion, and drum for  
the cams heretofore used for automatically  
60 working elevator-hatchways, an economy of  
space is effected, and my invention can be so  
varied in its details as to accommodate it to  
many circumstances and places where the cams  
of necessarily larger radius could not be used.

65 I do not confine myself to the use of spur-  
gear, because it may frequently be convenient

to use a bevel or miter segment and pinion.  
Neither do I confine myself to the use of a  
drum with a spiral groove for winding up the  
chain, rope, or other flexible connection em- 70  
ployed, because with a flat rope no grooves  
would be required and the spiral grooves are  
not necessary if the drum is properly flanged  
even for a round rope or chain. Nor is a spi-  
ral groove necessary when not more than one 75  
turn of the drum is required to wind up the  
rope. The drum K in the latter case would  
be simply a grooved pulley or sheave.

If necessary or desirable, a horizontal shaft  
revolving in suitable bearings may be em- 80  
ployed with a drum, K, on each end, with two  
chains or ropes instead of one connecting with  
the hatch, and the pinion J may be placed be-  
tween the two drums.

The automatic hatchway-opening mechan- 85  
ism hereinabove described, and shown in the  
drawings, but not claimed, will be made the  
subject-matter of a separate new application.

Having thus described my invention, what  
I claim as new, and desire to secure by Letters 90  
Patent, is—

1. The combination of the safety-racks *b*,  
with the suitably-guided and sliding spring  
catch-bolts *h*, spiral springs *t*, surrounding  
said bolts, and the bell-cranks *l*, operated by 95  
the cross-bolt or stud *g* of the sliding rope  
stirrup, link, or coupling *f*, substantially as  
described.

2. An elevator-cage consisting of a suitable  
and suitably-guided rectangular frame, A, car- 100  
rying a diagonally-placed platform, B, resting  
on the lower cross-piece, *m*, of the frame A, the  
outer corners of the platform B being rigidly  
supported from below by iron braces *w*, secured  
thereto and proceeding from near the lower 105  
extremities of the projecting uprights *k*, sub-  
stantially as described.

3. An elevator-cage consisting of a suitable  
and suitably-guided rectangular frame, A, car- 110  
rying a diagonally-placed platform, B, resting  
on the lower cross-piece, *m*, of the frame A,  
the outer corners of the platform being rigidly  
supported from below by iron braces *w*, se-  
cured thereto and proceeding from near the  
lower extremities of the projecting uprights *k*, 115  
the platform B being further supported from  
below and stiffened by a truss formed of a  
transverse beam, *x*, let into the lower cross-  
piece, *m*, and of two braces, *y*, proceeding  
from near the lower edge of the lower cross- 120  
piece, *m*, and terminating near the ends of  
the transverse beam *x*, substantially as de-  
scribed.

4. An elevator-cage consisting of a suitable  
and suitably-guided rectangular frame A, car- 125  
rying a diagonally-placed platform, B, formed  
of two layers of planking crossing each other  
at or nearly at right angles, and well bolted  
together with two bolts to each crossing, sub-  
stantially as specified, said platform resting 130  
on the lower cross-piece, *m*, of the frame A,  
its outer corners being rigidly supported from



below by iron braces *w*, secured thereto and proceeding from near the lower extremities of the projecting uprights *k*, as described.

5 . 5. An elevator-cage consisting of a suitable and suitably-guided rectangular frame, A, carrying a diagonally-placed platform, B, so arranged within said rectangular frame that the projecting corners of the platform will be thrown upon opposite sides of a line crossing  
10 the lower bar, *m*, of the rectangular frame centrally of its length, and at right angles thereto, substantially as described.

6. An elevator-cage consisting of a suitable and suitably-guided rectangular frame, A, carrying a diagonally-placed platform, B, in 15 which the guide-jaws *q* and *r* project unequally from the uprights *k*, in a manner substantially as described.

In testimony whereof I have hereunto set my hand this 22d day of March, A. D. 1884.

MARTIN W. HOBEN.

Witnesses:

JOHN MCCREARY,  
DAVID R. SMITH.