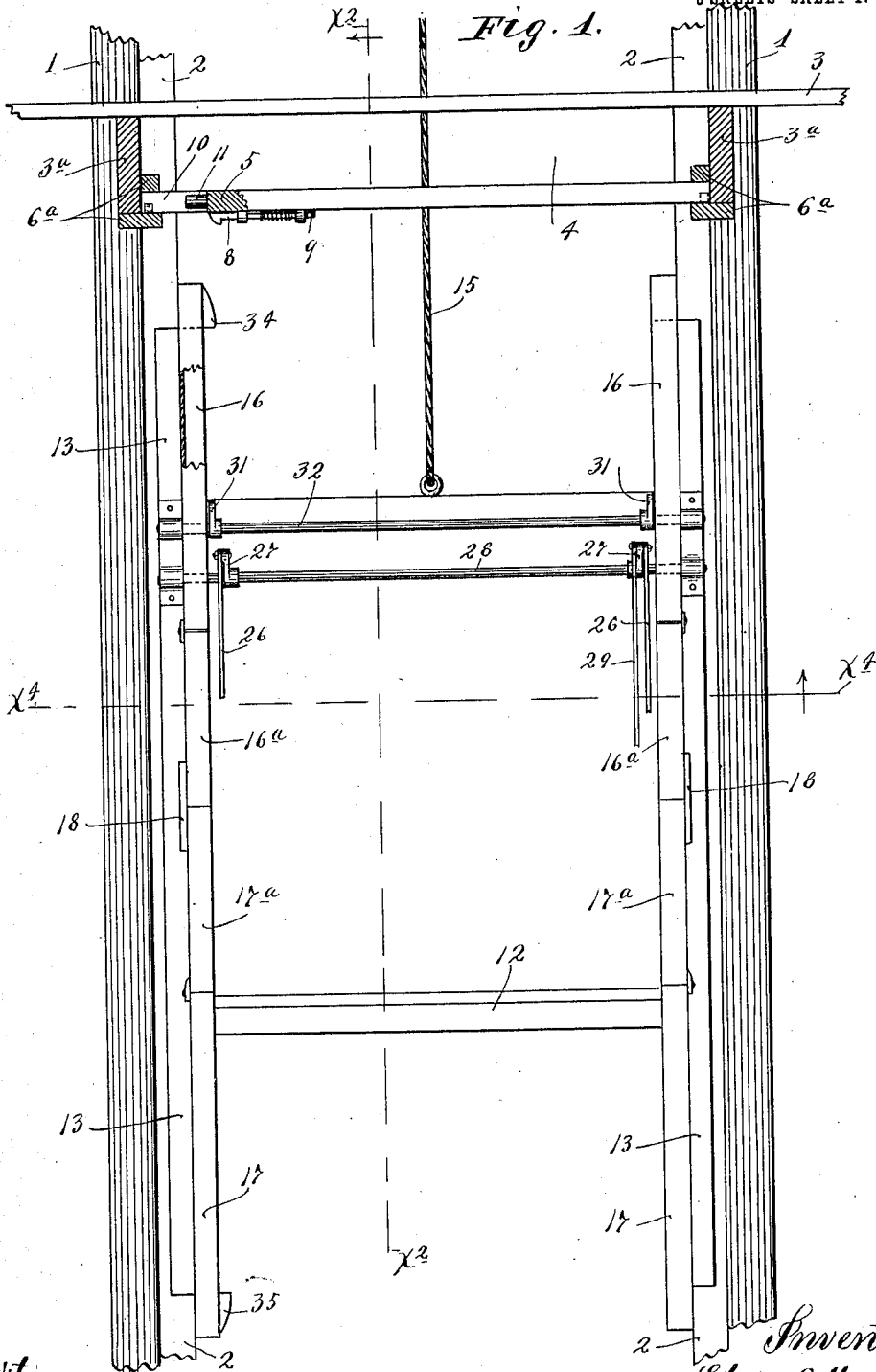


E. O. UNGAR.
FLOOR GATE ACTUATING DEVICE FOR ELEVATORS.
APPLICATION FILED JULY 20, 1906.

8 SHEETS—SHEET 1.



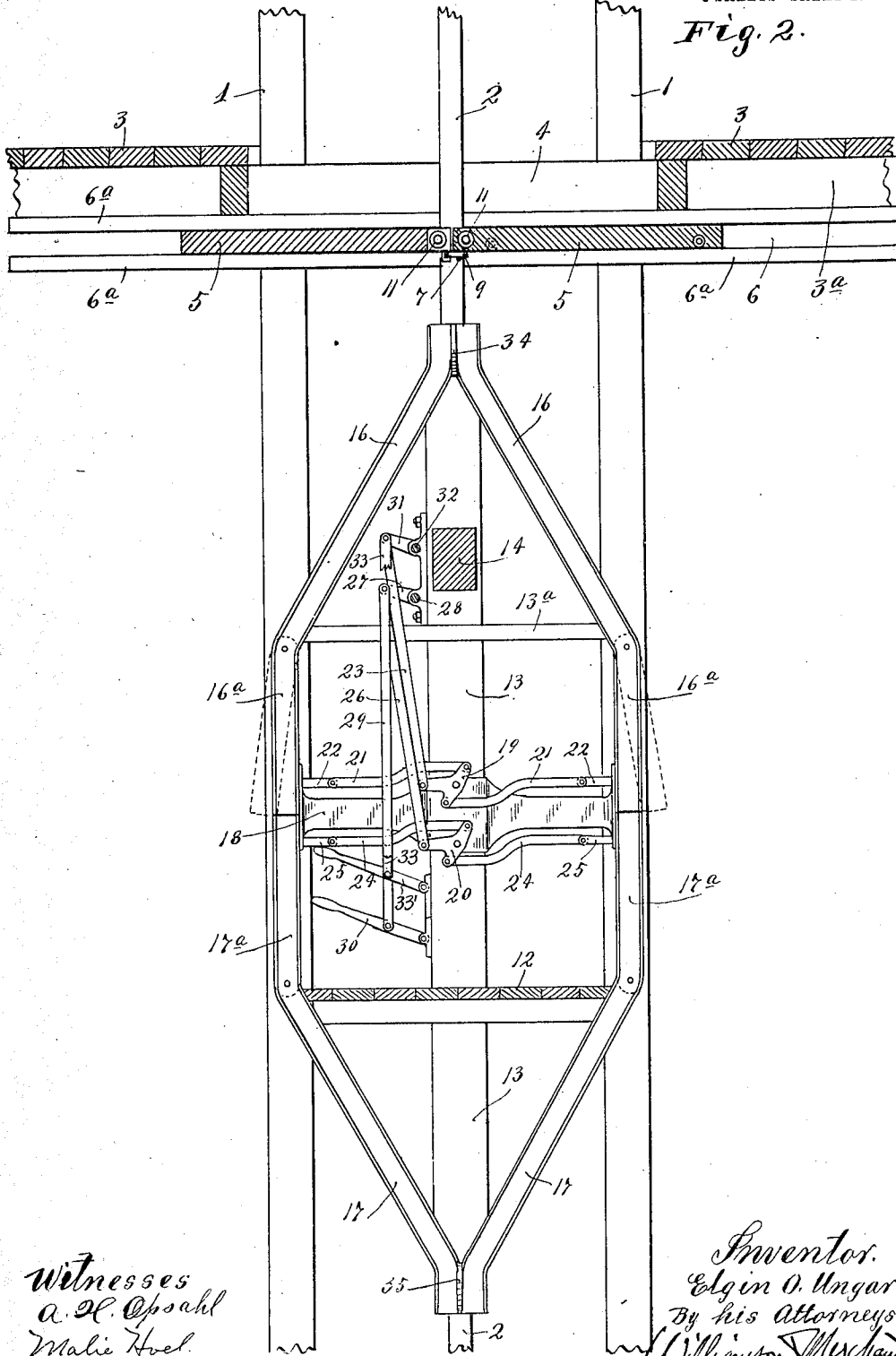
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8 SHEETS—SHEET 2.

Fig. 2.



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8 SHEETS—SHEET 3.

Fig. 3.

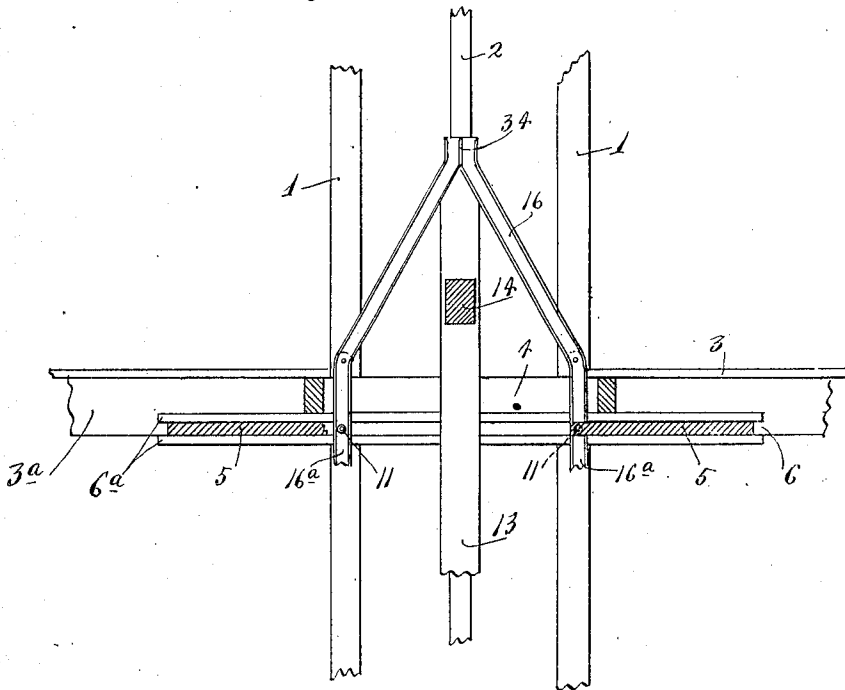
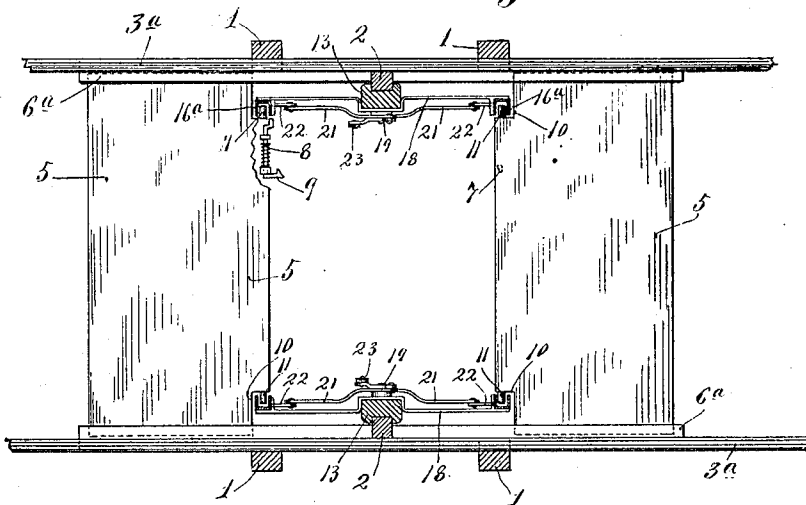


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FLOOR-GATE-ACTUATING DEVICE FOR ELEVATORS.

No. 870,860.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed July 20, 1906. Serial No. 327,025.

To all whom it may concern:

Be it known that I, ELGIN O. UNGAR, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Floor-Gate-Actuating Devices for Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved device for automatically closing and opening elevator shafts, and to this end it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view principally in side elevation, showing my invention as applied to an elevator shaft, some parts being broken away, some parts being sectioned, and some parts being removed. Fig. 2 is a vertical section taken on the line $x^2 x^2$ of Fig. 1. Fig. 3 is a fragmentary section taken on the same line as Fig. 2, but illustrating different positions of the parts; and Fig. 4 is a horizontal section taken on the line $x^4 x^4$ of Fig. 1.

The numeral 1 indicates the four corner posts of the rigid frame-work of the elevator shaft, and the numeral 2 indicates the vertical guides for the elevator car.

The numeral 3 indicates one of the floors of a building, the same having the usual opening 4 through which the elevator car may pass. The shaft opening 4 in the floor is adapted to be opened and closed by a gate preferably made up of two sections 5 that are adapted to slide horizontally in the guide channels 6, as shown, afforded by the guide strips 6^a secured to certain of the joists 3^a of the floor structure 3. In practice, of course, the opening in each of the several floors of the building through which the elevator shaft is passed should be provided with gates of the kind just described. For the sake of simplicity in the description, only the one gate will be hereinafter referred to. On one of the gate sections 5 adjacent to its inner edge, is a depending latch lug 7, and on the corresponding edge of the other gate section 5 is a spring pressed endwise movable latch bolt 8 having at one end a cam nosed latch hook 9 that is adapted to automatically engage the latch lug 7 when the two gate sections are forced together, and thereby lock the two gate sections in their closed positions. The hook 9 is adapted to be disengaged from the latch lug 7 by an endwise inward movement of the bolt 8 against the tension of its spring. For an important purpose which will presently appear,

the gate sections 5, at the outer extremities of their inner edges, are notched at 10 and are provided with projecting cam pins or lugs 11.

Only the main parts of the elevator car are shown in the drawings. Of the parts shown, the numeral 13 indicates the car floor or platform, which is rigidly secured to a pair of laterally spaced uprights 15 which, as shown, are of channel form and are arranged to slide vertically upon the car guiding strips 2. The uprights 13 are tied together at their upper portions by a heavy transverse beam 14 to which the car supporting cable 15 is attached in the usual or any suitable way.

At its sides, the car is provided with gate actuating cam ways which, described in the singular, are constructed as follows: Rigidly secured to the adjacent car upright 13 and to a transverse bar 13^a thereof, is a pair of downwardly diverging channel shaped cam bars 16, and in the same plane therewith, rigidly secured to the lower portion of said upright 13 and to the car floor 12, is a pair of reversely disposed upwardly diverging channel-shaped cam bars 17. The lower ends of the cam bars 16 are provided with vertically depending pivoted channel-shaped extensions 16^a, and the upper ends of the upwardly diverging cam bars 17 are provided with pivoted vertically extended channel-shaped extensions 17^a. Normally, the corresponding bar extensions 16^a and 17^a aline with each other, as shown by full lines in Fig. 2. The free ends of the said channel bar extensions 16^a and 17^a normally bear against and are guided and alined by the flanged ends of a transversely extended bracket 18 which is secured at its intermediate portion to the corresponding upright 13. To the intermediate portion of the bracket 18 is intermediately pivoted a pair of double ended bell cranks 19 and 20. Two of the arms of the double ended bell crank 19 are connected by links 21 to projecting studs 22 on the free ends of the pivoted cam bar extensions or sections 16^a; and the third arm of said bell crank is pivotally connected to the lower end of a link 23.

Two of the arms of the lower bell crank 20 are connected by links 24 to projecting studs 25 on the free upper ends of the cam bar extensions or sections 17^a and the third arm of said bell crank is pivotally connected to the lower end of a link 26. The links 26, at the opposite sides of the car, are pivotally connected to short arms 27 of a rock shaft 28, which rock shaft extends transversely across the car and is journaled at its ends in suitable bearings on the uprights 13 of said car. A link 29 connects one of the arms 27 to an operating lever 30 (see Fig. 2) which, as shown, is pivotally mounted on one of the uprights 13 near the car floor 12. With this arrangement, by means of the lever 30, all four of the cam bar sections or extensions 17^a may be

simultaneously moved to and from alined positions with respect to the lower ends of the pivoted cam bar extensions 16^a.

The links 23, at the opposite sides of the car, are connected to short arms 31 of a rock shaft 32 that extends transversely of the car and is journaled at its ends in suitable bearings on the uprights of the car. A link 33 connects one of the arms 31 to an operating lever 33' (see Fig. 2) which, as shown, is pivotally-mounted on one of the uprights 13 near the car floor 12. By rocking movements of this rock shaft 32, the four upper pivoted cam bar extensions or sections 16^a may be simultaneously moved from their full line positions into their dotted line positions (Fig. 2) and vice versa.

At the junction of the upper ends of the cam bars 16 is a small cam 34, and at the junction of the lower ends of the cam bars 17 is a similar cam 35. The cam 34 is so located that when the elevator is moved upward, it will engage the outwardly projecting end of the latch bolt 8 and release the latch hook 9 from the latch lug 7, and thus uncouple the two gate sections 5 before the cam bars 16 are thrown into action on the said gate sections. The cam 35 is so located that it will act in the manner above described and uncouple the gates when the car is moving downward, just before the cam bars 17 are thrown into action on the gate sections.

The upper extremities of the cam bars 16 and the lower extremities of the cam bars 17 stand in position to engage the corresponding cam pins 11 of the respective gate sections when the gate is closed. When the adjustable cam bars 16^a and 17^a are alined as shown by full lines in Fig. 1, and the car is moved upward, the diverging cam bars 16 acting on the cam pins 11 of the gate sections, will force the said gate sections into open positions, thereby permitting the car to pass, and after the car has passed the downwardly diverging cam bars 17 will force the said gate sections back into closed positions, in which closed position they will be automatically latched by the cooperating latch hook 9 and latch lug 7. As is evident, under the downward movement of the car, a reverse action takes place; that is, the cam bars 17 serve to open up the gate sections, and the cam bars 16 serve to close the same after the car has passed below the gate.

It is sometimes desirable to leave the gates in the floor openings open after the car has passed there-through. This action is made possible by the pivoted cam bars or cam way sections. If, for instance, when the car is going upward, the pivoted cam bars 16^a be moved outward into positions indicated by dotted lines in Fig. 2, it is evident that the gate sections 5 will be opened up, but that they will not be closed by the car after its upward movement, because the cam pins 11 of the said gate sections will be moved outward beyond the upper ends of the cam bar sections 17^a. If, on reaching the top of the elevator shaft, the cam bar sections 16^a be then moved back into their full line po-

sitions (Fig. 2) it is evident that the car may thereafter be run upward and downward without any action whatever upon the gate sections 5. When it is desired to again render the cam bars operative on the sliding gate sections, the cam bars 16^a, if the car then be moved downward, should be moved outward into their dotted line positions (Fig. 2), in which positions they will engage the cam pins 11 of the said gate sections and again direct the said cam pins back into the diverging cam bars 16.

As is evident, the above described action of throwing the gate sections into open positions and to again bring the same back into positions subject to the cam bars, may be performed by adjustments of the lower pivoted cam bar section 17^a. These lower pivoted cam bars 17^a should be used to throw the gates into extreme open positions when the car is moving downward, and they should be used to bring the gates back into closed positions when the car is moving upward.

As is evident, the mechanism above described makes it possible to manipulate the gate in the floor openings in any desired manner entirely by means carried by the car and within easy reach of the operator of the car.

It will of course be understood that in the drawings of this application many of the parts of the car have been left off. The car in practice may be of any desired design or type, and the novel devices above described and hereinafter claimed may be applied to either freight or passenger elevators.

What I claim is:

1. The combination with an elevator car and a floor gate, of cam bars on said car operative on said gate to open and close the same, including a pivoted cam bar section movable, at will, into a position to leave the said gate standing open after the car has passed the same, substantially as described.
2. The combination with an elevator car and a two part floor gate, of reversely diverging upper and lower cam bars on said car, operative on said gate sections to open and close the same, said cam bars having pivoted intermediate sections adapted to be moved into and out of line to connect and disconnect the corresponding members of said cam bars, substantially as described.
3. The combination with an elevator car and a floor gate made up of sliding sections, of the upper downwardly diverging cam bars 16 and the lower upwardly diverging cam bars 17 carried by said car and provided with the pivoted intermediate sections 16^a and 17^a respectively, the said bars being duplicated on the opposite sides of the car and arranged for action on the projections of the gate sections to open and close the same, connections whereby the four pivoted sections 16^a may be simultaneously moved into and out of line with the corresponding lower pivoted sections 17^a, and means whereby said four lower pivoted sections 17^a may be simultaneously moved into and out of line with the corresponding upper pivoted section 16^a, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ELGIN O. UNGAR.

Witnesses:

MALIE HOEL,
F. D. MERCHANT.